Sustainable Consumption, Promise or Myth?

Case Studies from the Field

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Edited by
Jean Léon Boucher and Jukka Heinonen

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We would like to dedicate this book to those—on an apparently fragile planet—who, themselves, dedicate much of their energy to thinking and/or working towards a vision of human-environmental sustainability.

—Jean and Jukka

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PREFACE

JEAN LÉON BOUCHER AND JUKKA HEINONEN

While assembling into one volume a number of recent case studies, this collection touches upon the promise and challenge of sustainability, sustainable consumption, and sustainable lifestyles; it visits certain dimensions of society as well as some perspectives on policy and instances of social transformation. Besides critiquing certain myths of sustainability, this text, at multiple scales—individual and societal, also reports from diverse cultural sites, from Europe to the hemispheric Americas.

This book will be of interest to anyone attracted to possibilities in sustainable consumption, be the person an individual consumer or academic, or an industry professional—from private or public sectors to non-governmental organizations. It can also fit for classroom use with its case studies, empirical examples, and diverse perspectives.

Overall, this volume documents recent scholarly attempts to critique and improve understandings of consumer lifestyles, certain environmental and societal consequences of such lifestyles, and some insights into transitions toward more sustainable human-environmental interactions.

CHAPTER ONE

INTRODUCTION: THE URGENT NEED FOR HUMAN-ENVIRONMENTAL SUSTAINABILITY

JUKKA HEINONEN AND JEAN LÉON BOUCHER

At present, human consumptive behavior is severely exploiting the material and ecological services of planet Earth; as a result, our species is on the verge of causing irreversible damage to our planet's regenerative biocapacities (e.g., Barnosky et al. 2012; Ceballos et al. 2017; Steffen et al. 2015). The Earth's climate is reportedly changing more rapidly, biodiversity loss has accelerated at an alarming rate, and scientists warn of the beginnings of a new mass extinction (Ceballos et al. 2017; Chapin et al. 2000; Rockström et al. 2009; Steffen et al. 2015). At the same time, population growth continues, and while a debated driver of many ecological problems, it may also be fueling broader social problems.

Many scholars are theorizing urbanization and urban centers as a primary source of these problems, but also, in contrast, these centers are seen as critical to designing global solutions (e.g., Grim et al. 2008). More than 50% of the world's population currently live in these urban areas (UN 2015) requiring more and more land area (Seto et al. 2011), and this figure is growing. These centers have been assessed as major drivers of climate change and, indirectly, of current environmental degradation. However, clear solutions are not immediately in view, particularly at the global level. Neither is it known who the primary change agents are, for example, bottom up grassroot movements or top-down policies. Grassroot actors may be more progressive in their demands and actions, but their overall impact is most likely limited.

Even if a sustainable future is beyond the present human view, new initiatives keep appearing that potentially improve the chances of solving the present puzzle. Furthermore, these initiatives appear in all forms: from intergovernmental high-level treaties such as the Paris Accord; nation-state activities (e.g., the Climate Mayors agreement in the USA); municipal agreements—at both the global and local levels (e.g., C40 Cities Climate Leadership Group and the International Council for Local Environmental Initiatives [ICLEI]); and grassroots activist movements and organizations, some of which extend internationally (e.g., WWF, Greenpeace, and others) while others are critical to low-impact, regenerative technologies, or the promotion of more sustainable lifestyles.

Reports from the global field: Individuals, movements, and communities

In this book, we provide a collection of "reports from the field," mostly case studies of different initiatives in the broad field of sustainable consumption, inclusive of grassroots interventions, community-level assessments, and even the individual consumer. This volume is not meant to be a comprehensive selection but offers new thoughts and ideas through a set of *cases from the field* that are not covered by previous publication. These reports touch upon several different scales in the research field of sustainable consumption: from cities to individuals, from communities to social movements.

Sustainability and the Consumer

Consumer choices are important drivers of present societal functioning, they influence the production of goods, but also the negative environmental impacts of such production. Especially when it comes to affluent societies, consumers can have particularly costly preferences—both economically and environmentally—as they strive toward higher and higher levels of material satisfaction. Consumers also decide how they live, reside, if they will travel—where, when, and how—and who will be their political leaders; leaders who may or may not set policies for greater environmental sustainability. In this book, we consider some of the different perspectives of the consumer as a driver of consumption culture, practices and policies; through these case studies different insights may be gleaned.

Jukka Heinonen and Sigurður Eyberg Jóhannesson present the first case study—the case of the "low-carbon illusion of cities": how urban centers are often reported as more sustainable than non-urban areas while this might not be the case in reality. The illusion arises when consumption in affluent cities continually expands, whereas production moves to lower production cost locations. City-scale territorial assessments may in such cases show decreasing emissions while the demand of the city actually drives more and more emissions globally. Heinonen and Jóhannesson study Iceland and assess the consumption-based carbon footprints of different types of settlements accounting for all private consumption. Iceland makes an interesting case as it produces a very limited variety of consumer goods while its high affluence drives consumeristic lifestyles, particularly in the capital area and a few other centers. They find that carbon footprints are generally as high as in other Nordic countries despite the carbon-free electricity and heat production. Furthermore, emissions are the highest in the capital region, followed by other cities, which ultimately maintains the low-carbon illusion of the cities hypothesis.

The carbon footprint approach continues in the next chapter in which Juudit Ottelin, Jukka Heinonen and Seppo Junnila test the relationship between city compactness and consumption-based carbon footprints of residents. Their approach arises from the current contradictory beliefs about the impact of compactness. On one hand, compactness is expected to reduce greenhouse gas emissions. On the other, these dense urban areas are associated with agglomeration economies; increasing population leading to increasing productivity. They argue that this is a critical point as income is the main driver of personal carbon footprint and economic growth the main driver of global GHGs. Their study includes the 20 largest cities in Finland and depicts how, in this context, compactness is associated with increasing income and increasing carbon footprints. The emissions caused by driving decrease, but the emissions caused by other consumption increase and offset the gains from higher compactness. The authors argue that decision-makers should understand that the compact city concept might work directly against initiatives toward environmental sustainability.

While these early chapters focus on personal consumption and related GHGs, cars and driving are still a major emissions source, and probably the one for which most reduction schemes are designed. In Chapter 4, Paul Nieuwenhuis reflects on a consumer product with an immense environmental impact, the automobile. He approaches mobility and particularly personal car ownership and use from a systemic philosophical perspective; he argues that an understanding of the whole car system is central to any attempts toward its more sustainable consumption and production. He also states that the unsustainability of the car system should not be taken just as a technological issue, but also as a philosophical and sociological one; why do we possess cars as we currently do, why do they remain in use for such a short period, and how to affect these issues. He extends his discussion to the root drivers of the current unsustainable consumption economy and suggests solutions for the car system.

Jean Léon Boucher continues with the mobility issue by selectively analyzing cars, climate change attitudes, and social norms. His study arises from the ground set by the climate change crisis and how spatialized attitudes and norms may affect one of the major climate change drivers: the motor vehicle and its usage. In the context of the U.S., he finds that those "Alarmed" by climate change minimally reduce their driving related emissions and, though there is a certain "power of the social" that influences vehicle emission rates—more than usage itself, household income remains the more powerful determinant of carbon intensive behaviors. Though Boucher argues for more scholarly research on the "power of the social," the persistent income-carbon relationship and the "power to pollute" should also be addressed by policy makers.

Sustainability in Community

After the carbon footprint and mobility cases the book veers toward community-level action.[1] Community-level action plays an important role in the search for more sustainable ways to organize individual and collective lifestyles and in improving the equality among human communities. Eco-villages, car-sharing clubs, car-free neighborhoods, as well as urban gardening and other local-food initiatives are examples of community actions which may lead to greater collective sustainability, while possibly spreading to the wider society. More recently, "downshifting" types of communities seem to have gained some traction while warnings increase that the current fossil-fuel based economy is leading to ecological disaster.

This book covers three examples of community-level action towards sustainability and one community-level "environmental entrepreneur" case. In chapter six Spencer Harbo and Raymond De Young present a study on the motivations and conditions that facilitated community-based resource sharing in a community in Southeastern Michigan. They critique the current state of hyper-individualized consumption, where resource sharing is scarce and fossil-fuel dependency high. They find common motivations for sharing in frugality, social participation and meaningful action. Moreover, they find a spillover effect which leads sharing to other pro-environmental and pro-social behaviors, suggesting that a cultural shift toward community-based resource sharing may further influence human values, norms, and actions towards a "greener" society.

Next Chelsea Schelly presents the cases of two intentional communities and shows how alternative forms of economic organization offer a potential for shifting economies away from environmentally catastrophic practices and toward a higher quality of life for more people. She presents two bottom-up case studies: Twin Oaks, a labor and income sharing community, and Dancing Rabbit Ecovillage. She describes how these communities reach significantly lower material and space requirements through sharing and a partial decoupling from the regular monetary economy. These case studies offer interesting policy-insights. Firstly, in an effort to reduce materialism and consumerism, what can practitioners and policy-makers learn from these communities? Secondly, Schelly identifies how current regulations largely prevent alternative communities from emerging. She suggests that the most valuable tool for environmental sustainability might be to allow for flexible experimentation in alternative forms of organizing residential life.

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[1] All these cases are multi-scalar, but we loosely try to cluster them.

In the third community-level study, Rita Afonso, Cristine Carvalho and Bibiana Serpa examine three case studies in Brazil and ask if culture in the favelas could be considered as an ethical and sustainable field of production and consumption. Their research emerges from a quest for healthy and progressive living in an area where many people are still deprived of access to basic rights and resources. Their study offers insights into how cultural activities in favelas can be placed within the context of ethical and sustainable frameworks. They also offer ideas for improving the living conditions in such communities.

The study of the "environmental entrepreneurship," chapter nine by Vesela Veleva and Gavin Bodkin, examine from an entrepreneurial perspective some widely recognized drivers of unsustainable consumption: short product lifecycles, premature disposal, and often high repair costs. Veleva and Bodkin focus on furniture reuse and present the case of The Furniture Trust, a non-profit company in Boston, Massachusetts. The study looks into the possibilities of the "environmental entrepreneurial" business response to the problem of unused surplus furniture. They also analyze the main drivers, barriers and future opportunities for furniture reuse. They argue that there is a need for greater governmental support for environmental entrepreneurs—from funding to policy actions—in order to encourage more innovative business responses and a transition to more sustainable consumption.

Sustainability and Social Movements

Social movements are another key channel for sustainability initiatives, one which often is not bound by geographic or other boundaries, particularly in the current era of digital society. Likely boosted by the accumulation of facts on global ecological degradation and the continued challenges of social sustainability, growing activism has emerged with the aim of altering both lifestyles and the organization of societies. Although the majority of initiatives may be categorized as the habits and actions of few individuals rather than actual movements, some are recognized globally and may impact the behavior of millions of people—while they renew efforts on both voluntary and more formal regulatory levels. The Buy Nothing Day, downshifting, permacultures, and even veganism can be taken as examples of movements of different types and scales with a common aim of improving the environmental state of the world. This volume includes three studies presenting very different perspectives to social movements.

First, Franziska Haucke discusses the Fairphone as a case for a lifestyle movement. While the Fairphone company strives toward a more ethical and sustainable smartphone manufacture, Haucke specifically concentrates on the political mobilization of Fairphone consumers, i.e., the potential transformation of individual sustainable consumption into a conscious political act and expression of ecological citizenship. With a user survey and interviews, she shows which aspects of Fairphone-usage relate to ethical and environmental responsibility and how users, through individual actions, can boost the wider movement for sustainability.

Next, Franziska Haucke, Jan Pollex and Andrea Lenschow concentrate on sustainable consumption patterns in the era of digital society. They are concerned that, despite the many attempts, there are no significant changes in current resource-intensive consumption patterns. In particular, they analyze the underlying mechanisms and structures that support individualized political actions in the context of sustainable consumption. Their focus is on the crucial role of the Internet and social media in facilitating new social dynamics, which in turn might foster new ways toward sustainability. They show how digital media has changed the premises of the emergence and subsequent power of movements toward sustainable consumption; they also argue for much stronger—replacing soft—policy measures.

In the last chapter, Satu Husso visits the role of social movements in the transition to sustainability. She notes that current actions toward sustainability have not affected contemporary consumerist lifestyles. She also examines the sustainability movement's role in tackling the issues of power embedded in the discourses and practices of pursuing a sustainable human-environmental relationship. She finds that the discourses and practices established by the sustainability movement—like Degrowth, Carrotmob, and buycott campaigns—aim to encourage people to adopt more sustainable lifestyles and to engage in broader systemic change. She also claims that knowledge practices are essential in everyday consumption choices as well as for making broader institutional change.

A user's guide

What are the key takeaways from these studies? Though these chapters do not comprehensively converge on a singular issue, they do visit some of the different scales in sustainable consumption and provide insight for designing sustainability policy. They may also be read and "thought through" with other contexts, peoples and locations in mind. Such interactions may fuel new social initiatives and research projects aligned with the goal of creating a more sustainable future. Anyone working or teaching in the field of sustainable consumption should also be attracted to something in this diverse set of cases, from cars to Carrotmobs, from communities to consumers Additionally, as all these chapters are academically situated, the bibliographic references can serve to guide a newcomer or students trying to familiarize themselves with different facets of sustainable consumption research.

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CHAPTER TWO

MORE CONSUMPTION, LESS PRODUCTION: THE LOW-CARBON ILLUSION OF CITIES

JUKKA HEINONEN
AND SIGURÐUR EYBERG JÓHANNESSON

Abstract

This chapter presents an assessment of the consumption-based carbon footprints (CFs) in Iceland using an input-output based hybrid life cycle assessment method, including all private consumption and both direct and indirect emissions. Moreover, we compare the CFs in different types of settlements to test the "low-carbon illusion of cities" hypothesis. In territorial assessment schemes, highly urbanized areas are often reported as low-carbon areas in comparison to country averages or regional averages, but at the same time they are the key centers for consumption and actually just outsource/externalize the emissions they or their residents emit. Therefore, while cities often show reduced transport related emissions compared to less urbanized areas, the emissions from other forms of consumption typically increase and the overall CF can be greater in the densest settlements. What we found is that the CFs are the highest in the most highly urbanized areas and somewhat lower in more rural areas. Especially indirect emissions from services are significantly greater in urbanized and more affluent areas. With transport, the results also align with the hypothesis that higher population density reduces private driving, but as in several earlier studies, when all transportation related emissions are accounted for, the advantage of density is greatly reduced or disappears. Consumption power is the strongest driving factor of CFs, and affluence tends to increase in cities in comparison to less urbanized areas. Thus, when controlling for consumption expenditure, slight negative connection between density and CFs is found.

Introduction

No nation is self-sufficient in the raw materials and manufactured goods it or its residents require to fulfil their consumption needs. Actually, an increasing share of all the consumed goods are produced elsewhere than where consumed. Therefore, since the majority of all the environmental burdens of different goods are generated during the production and supply chain before the end-user (Matthews et al. 2008), a certain geographic unit often causes significant environmental pressures outside of its own area (Ivanova et al. 2016; Davis and Caldeira 2010; Chen et al. 2016).

This effect is likely to be stronger the smaller the unit analyzed. Cities and small island states are perfect examples of places where a major share of the consumed goods is imported. The resulting phenomenon can be called "the low-carbon illusion of cities," since along with urbanization and the quest for affluence, more and more consumption concentrates in cities while production is relocated to areas with lower production costs (Heinonen et al. 2013a; Wiedenhofer et al. 2013). Heinonen et al. (2013a-b) and Ottelin et al. (2015) have shown that the connection between reduced greenhouse gases (GHGs) and increased population density might not hold when accounting for the emissions embodied in imported goods. They also point out how much more complex the issue is and how policy aimed at lowering GHGs needs to take a much more holistic approach in order to truly work towards a low carbon future. Relatedly, there is evidence that many of the environmental problems in developing countries as well as a major share of their GHG emissions are "outsourced" emissions from the more affluent countries (Davis and Caldeira 2010; Ivanova et al. 2016). Nevertheless, current global initiatives to improve environmental sustainability predominantly rely on the traditional national emissions inventories, Kyoto Protocol being probably the best-known example.

Life cycle analysis (LCA) has been introduced by scholars as a more viable method to evaluate environmental impacts of systems and products. An LCA analysis not only attempts to assess direct environmental impacts but indirect impacts occurring along the whole supply chain. Carbon footprinting or assessments of GHG emissions using LCAs have become more popular in recent years (Baiocchi et al. 2010; Newman, 2006; Minx et al. 2013) as the emphasis on quantifying human GHG emissions, to inform public policy design, has gathered momentum (Laurent et al. 2012). Consumption-based carbon footprint (CF) assessments have become a more popular way of assessing the emissions caused by the consumption of goods and services of a certain geographic unit, regardless of where production takes place and emissions are actually generated. The key strength of this method is its ability to account for carbon leakage from consumption-oriented regions, or their outsourced emissions—displaced from more affluent countries (Heinonen and Junnila 2011).

In this study, we aim to examine the consumption-based CFs in Iceland. Iceland makes an interesting case for such an assessment, since it produces very limited variety of consumer goods, but is highly affluent with its affluence concentrating mostly in the capital area and to the few other urban centers. The local energy system is near 100% renewables-based contributing to the local production-based emissions being low in global comparison. At the same time, however, many goods are imported and along with increasing affluence local life becomes more and more consumption-oriented. To realize our study, we utilize the 2002 U.S. Benchmark Purchaser Price Economic Input-Output Life-Cycle Assessment (EIO LCA) model, amended with local process data. We also use the Household Budget Survey to assess the CFs of average Icelanders living in different types of urban areas in the country. The results are cross-analyzed to understand the impacts of affluence and lifestyle differences within the country. Absolute footprints, income, region, and housing type are controlled and results are presented. Our findings strengthen the hypothesis of the "low-carbon illusion of cities."

Research methods

Life cycle analysis (LCA) is a method designed to evaluate negative impacts on the environment caused by production of products and services (Suh et al. 2004; Dong & Ng 2014). An LCA assessment includes not only direct impacts caused by the product in question but impacts associated with the whole supply chain from manufacture to disposal or re-use (cradle to grave / cradle to cradle). Vigon et al. (1993) have defined this process as:

> A concept and a methodology to evaluate the environmental effects of a product or activity by analyzing the entire life cycle of a particular product, process, or activity.

An LCA streamlined to include only GHG emissions can be called a carbon footprint (Wiedmann and Minx 2008). The most established version of LCA is the so-called process LCA where energy and mass flows are used to evaluate environmental impacts. Process LCAs are detailed, thorough accounts of inputs and discharges of any given production system or product, but on the downside, due to the level of detail, it is very time consuming and labor intensive (Hendrickson et al. 2006).

An alternative way of conducting LCA analysis is using monetary values to assess the environmental impacts of the life cycle. This kind of model is based on Wassily Leontief's economic input-output (IO) accounting, with the addition of an environmental extension. The upside of IO LCA is that compared to process LCA it greatly simplifies the assessment since the information the practitioner would have to gather from all the processes of the supply chain is now included in the input-output tables. The input-output tables are in most cases readily available as a part of national accounting. An IO LCA furthermore can include the impacts from the whole production and supply chain including capital goods or production infrastructure. On the other hand, the IO approach is based on averages and cannot produce the level of detail that a process LCA, at least in theory, can.

Practitioners and researchers often attempt to combine the best elements of these two approaches—mainly the scope of the IO with some of the detail of the process LCA—into a process/IO hybrid LCA model. These can take on various forms, but all are aimed at utilizing the benefits of the process and IO models while bypassing their biggest drawbacks (Suh et al. 2004; Hendrickson et al. 2006).

The assessment

Input data

The primary data source in this study was the most recent 2010-2012 Household Expenditure Survey of Statistics Iceland (2015). The survey provides yearly expenditure figures for different types of households located in different types of areas in Iceland. The survey captures the consumption of purchased goods and services over a year, and separates over 1,000 different categories of consumption based on an international COICOP classification. In addition, the survey includes a wide variety of background variables. The survey utilized in this study includes 1,765 households which include slightly over 5,000 residents.

Samples

The expenditure survey data includes a settlement type variable, which divides the settlements in Iceland into three categories: Reykjavik Capital Area (Capital), towns outside the capital area (Towns) and rural villages (Villages). These three settlement types were compared along with the housing types. Table 1 presents the samples and certain qualities related to each sample. As the table depicts, the households are relatively similar in size, but the more affluent households live in the larger settlements and the housing types change significantly as well from the more rural types of settlements to the more urbanized.

Table 1. The samples and key qualities related to each sample.

	Capital	Towns	Villages
Sample size	1139	429	198
Average household size	2.8	2.9	2.9
Housing type			
- single family house	34%	64%	89%
- multi family house	66%	36%	11%
Annual expenditure (isk[1])	3,051,000	2,764,000	2,310,000
Possessed cars	1.3	1.4	1.4

Assessment model

We employed the U.S. economy-based EE IO model produced and published by the Carnegie Mellon University Green Design Institute, called the 2002 U.S. Benchmark Purchaser Price Economic Input-Output Life-Cycle Assessment model (EIO LCA) (CMU Green Design Institute 2010), adjusted with Icelandic data for some key local activities. The EIO LCA is among the most disaggregated models available with 428 economic sectors, which provides better sectoral fit between the model and the data than the majority of other existing models. Being a purchaser price model, the emission outputs are adjusted to the final end-user market prices. The classification follows the North American Industry Classification System (NAICS), but the fit is relatively good with the Classification of individual consumption by purpose (COICOP) system as well. The adjustments to the model are explained below and the uncertainties associated with the model selection are discussed in the discussion section.

EIO LCA assessment

Data matching and adjustments

167 EIO LCA sectors were found to match the input data with the IO model. Adjustments were made to the IO sectors to 1) account for the low-carbon energy production in Iceland (Karlsdottir et al. 2014), 2) include the

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[1] Icelandic krona, average exchange rate over the data period 2010-2012: \$1 = 123 isk.

emissions from fuel combustion, which typically do not appear in IO models—them being cradle-to-gate models (e.g. Lenzen 2000) and 3) adjust the US dollar-based model from 2002 to Icelandic data from 2010-2012.

Regarding building energy use, the EIO LCA model was not employed at all, but the GHG intensities of energy production were taken from Karlsdottir et al. (2014). The whole production system in Iceland is based on renewables, mainly hydro- and geothermal heat and power. Thus the GHG intensities are very low, arising mainly from the construction and maintenance of the production and delivery infrastructure: for heat 2 g CO2e/kWh and for electricity 11 g CO2e/kWh (Karlsdottir et al. 2014). There is virtually no oil or natural gas consumption in Iceland for electricity generation or for property-specific use like heating and cooking.

Petroleum combustion of private vehicles was assessed combining the EIO LCA petroleum production sector with the tailpipe GHGs from driving. Fuel price, 235.50 isk/l on average for 2010-2012, was taken from Statistics Iceland and the emissions from fuel combustion, 2.33 kg CO2e/liter from the U.S. Environmental Protection Agency. In the calculation the expenditure on fuel purchases was first used to assess the cradle-to-gate GHGs of petroleum production with the EIO LCA model and then again to add the emissions from fuel combustion based on fuel purchases following the process used by Heinonen and Junnila (2011) and Ottelin et al. (2015).

Finally, to improve the model-data match, the EIO LCA sectoral GHG intensities were adjusted according to the sectoral inflation 2002-2011 data of the U.S. Bureau of Labor Statistics Consumer Price Indices. Then the intensities were changed to Icelandic currency according to the average currency exchange rate 2010-2012, $1 = 123 isk.

Expenditure survey data weaknesses

Consumption surveys generally describe well the daily consumption patterns of households, but the accurateness decreases with less frequently purchased goods and services. Especially the emissions from residential construction are not well reflected through expenditure survey data (e.g., Ottelin et al. 2015). In previous studies these have either been fully omitted (Bin and Dowlatabadi 2005; Athanassiadis 2016), added as constant amounts for all the households (Jones and Kammen 2011), by estimating the share of the mortgage or rental payments being actually the payment for the building construction (Heinonen and Junnila 2011) or according to the year of construction and the possessed square meters (Ottelin et al. 2015). In all of these options, the impact of the building construction sector has remained relatively low and the uncertainty related to the assessment is high, so in the current study we decided to omit the emissions from residential construction. Since the majority of new residential developments take place in the biggest cities, this decision might lead to a slight underestimation of the CFs in the areas of rapid development.

Another issue is that rental and housing management payments often include utilities and will therefore distort the CFs attributed to those living in apartment buildings (e.g., Heinonen & Junnila 2014). In Iceland, however, due to the low-carbon energy system, the impact of energy use on the CFs is low and thus no action was taken to separate these payments from housing payments, but a zero emissions intensity was given to them.

Thirdly, the expenditure surveys do not include the consumption of free-of-charge services (public services paid through taxes). In Iceland, like other Nordic countries, education, daycare and healthcare services are heavily subsidized almost free-of-charge services and thus an input-output approach leads to a significant underestimation of the emissions from these. Especially healthcare, in some studies, has been shown to have some significance (Jones and Kammen 2011), but since no data is available to incorporate them in a reliable manner, and since they are likely to be similar in different locations, they were left out.

Results

Carbon footprints in Iceland

The per capita annual CFs appear to be the highest in the most urbanized and affluent area, the Capital, 11.6 tons of CO_2 equivalent (t CO_2e), but the Towns average 11.3 t CO_2e is very close (Figure 1). Moreover, similarly to the situation reported in Finland (Heinonen et al. 2013a), Australia (Wiedenhofer et al. 2013) and California (Heinonen, 2016), the lowest CFs are found in the more rural types of settlements, Villages, 10.2 t CO_2e.

The main sources of emissions are Transport and Food as Figure 1 depicts. Food is about 3 t CO_2e in each settlement type, and Transport from 3.5 t CO_2e in Villages to 3.6 in the Capital and 4.0 in Towns. Interestingly, the GHGs from transport do not decrease towards the denser settlement types. Fuel consumption is the highest in Villages, generating 2.3 tons of CO_2e compared to 1.8 tons in Villages and 1.9 in the Capital, but the difference is compensated by elevated emissions from vehicle purchases and especially from aviation in the more affluent Towns and the Capital. This finding aligns with earlier findings from Finland (Heinonen et al. 2013a; Ottelin et al. 2014). In Iceland it is noticeable that car-dependency is high all around the country, as the car possession data in Table 1 depicts.

These two categories together—Food and Transport—are responsible for well over 50% of the overall CFs.

Services play an important role as well, adding almost three tons to the CFs of Capital residents, 2.8 t CO_2e. In Towns they add 2.5 tons to the CFs, but in Villages only 1.9 tons. This is partially due to the income effect, the more affluent residents just being able to purchase more services. However, it also follows the hypothesis of Heinonen et al. (2013a) that in denser areas residents actually make a trade-off between possessed living space and services in close proximity, which can be used to extend the living space. This means that they accept smaller living spaces in exchange for the better service level of the surrounding areas, and spend less time at home and more time away using these services, such as restaurants, cafés, gyms, theatres and so on. Still the share of services is relatively high even in the least urbanized areas suggesting that even if service consumption might be a preferable option to the consumption of physical goods, many services actually are very material-intensive and have relatively high GHG intensities. Particularly cafés and restaurants and cultural services are used more in the Capital, where their availability is the greater. Housing and Physical goods have the smallest shares, but especially with physical goods the emissions are significantly lower in the least urbanized settlements.

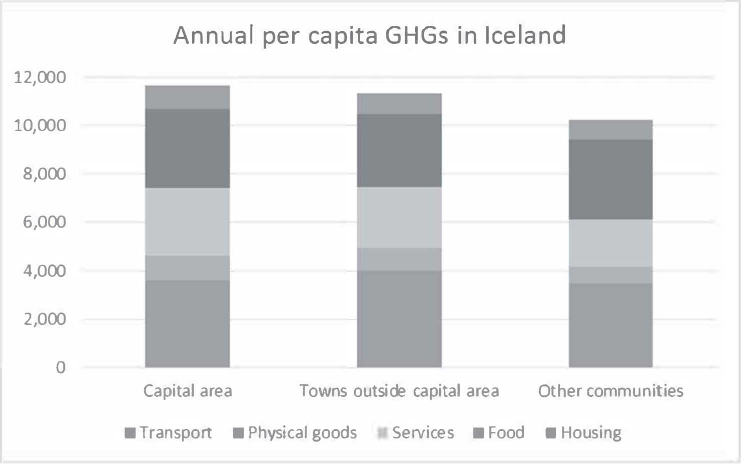

Figure 1. The annual per capita CFs in Iceland (kg CO2e).

Urban sprawl and carbon footprints

As a crude measure, detached house living can be set to present urban sprawl in urbanized areas (Ala-Mantila et al. 2013). In Iceland, the most interesting area is the Capital, the most highly urbanized area and the area with the highest CFs in Iceland. Looking separately the detached house residents and apartment building residents of the Capital, somewhat surprisingly, the apartment building residents have the highest CFs of these two groups at 12.5 t CO_2e/capita whereas the CF of detached house residents remains at 9.5 t CO_2e/capita, as depicted in Figure 2.

In a similar comparison in the Helsinki Metropolitan Area in Finland, Ala-Mantila et al. (2013) found a reverse situation, but at the same time the situation in Reykjavik is similar to the comparison between city center residents and suburban residents in Finland presented by Heinonen et al. (2011). The key reason lies in affluence and intra-household sharing. The residents of apartment buildings are predominantly adult households without children, whereas the families with children locate to detached houses. Heinonen et al. (2013a-b) and Ala-Mantila et al. (2016) have shown how important the GHG impact of household size and intra-household sharing can be, and how difficult it is to have a low-carbon lifestyle in smaller household units.

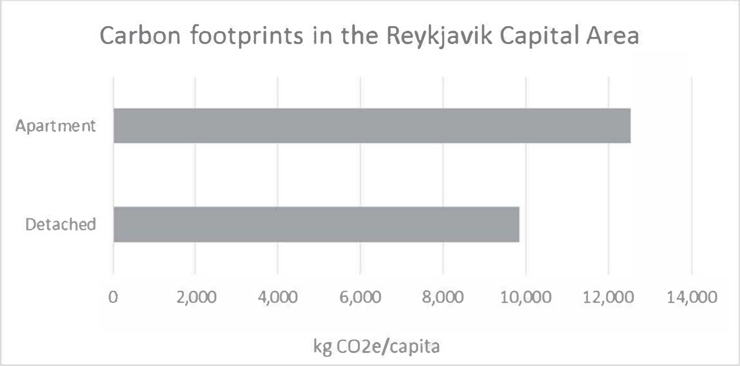

Figure 2. The annual per capita CFs in apartment buildings and detached houses in the Reykjavik Capital Area (kg CO_2e).

Relative effects of urbanity and housing type

Affluence is highly correlated with the CF of an individual. Those who are more affluent simply do more and use more to cause more GHG emissions. Affluence also generally concentrates to the more urbanized areas with the most diverse consumption opportunities, also evident in Iceland, as shown in Table 1. If we bracket-off the discussion about the sources of increased wealth in the more urbanized areas and the potential lifestyle impacts of living in certain types of settlements (see e.g. Heinonen et al. 2013a for an extensive discussion on the connections), we can analyze the relative impacts of the degree of urbanity and housing choices. In this manner, controlling for consumption expenditure and analyzing the relative impact of the degree of urbanity, living in more urbanized areas becomes the preferred option in terms of the average CFs. We use a non-linear model with natural logarithmic transformations for both the dependent variable, CF, and the independent variable, expenditure, following earlier literature (Lenzen et al. 2006; Kerkhof et al. 2009; Shammin et al. 2010; Ala-Mantila et al. 2014) and the three urbanity types from Table 1. This leads to the Capital showing the lowest relative CFs, 9% below those of Villages. Towns also have 5% lower relative CFs in comparison to Villages. Both differences are statistically significant at 0.001. R^2 is 0.94 meaning that the explanatory power of this analysis is high and the model explains the differences very well.

Table 2. The regression results for expenditure, level of urbanity and housing type.

	CFs	R^2	Sig.
Expenditure	0.94	0.88	0.001
Urbanity (ref. Villages)		0.94	
Towns	-0.05		-
Capital	-0.09		0.001
Housing type (ref. Apartment)		0.88	
Detached house	0.01		-

- (dash) indicates statistical non-significance.

Figure 2 illustrated how CFs are highest for apartment building residents in the Capital. These residents actually have the highest consumption power, and thus it is not surprising that in relative terms, when consumption expenditure is controlled, there is no significant difference in CFs between the two housing types as depicted in Table 2. Table 2 shows how detached house living increases the CFs by 1% in the Capital when consumption expenditure is controlled, but without statistical significance. Expenditure and housing type as independent variables again lead to high explanatory power ($R^2=0.84$).

Finally, Figure 3 presents the individual CFs and shows the strong correlation with the consumption volume and depicts how similar the CF distributions are. The spread between the highest and the lowest CFs is substantial at any consumption level, but far reaching conclusions should not be made, since we are using data covering a relatively short period of time. For more meaningful results, larger data samples are needed. Still, it is notable that the spread is the highest in the Capital.

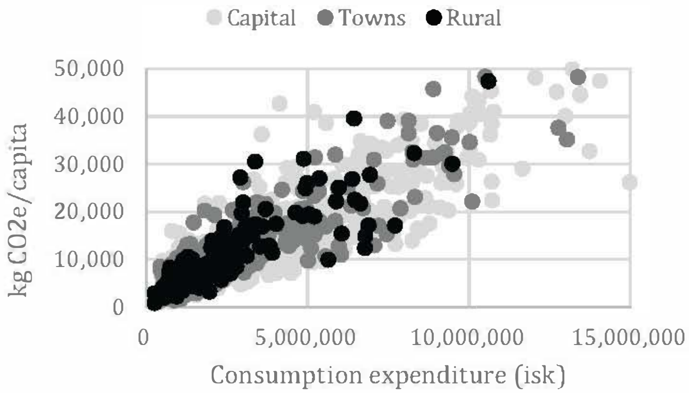

Figure 3. The individual CFs (kg CO2e/a) and the monetary consumption (isk/a).

Discussion

Main findings

The aim of this study was to assess for the first time the consumption-based CFs in Iceland taking into account all private consumption, and both direct and indirect emissions. Further, the study was set to compare the CFs in different types of settlements to test the "low-carbon illusion of cities" hypothesis, meaning that in territorial assessment schemes highly urbanized areas often show as low-carbon areas in comparison to country averages or regional averages, but at the same time they are the key centers for consumption and actually just outsource the emissions they drive. Thus, while cities often show reduced transport related emissions compared to less urbanized areas, or denser settlements compared to less dense (e.g., Badoe & Miller 2000, Ewing & Cervero 2010, Naess 2012), the higher emissions from other forms of consumption cause CFs to be highest in the densest settlements. This has already been found by Heinonen et al. (2013a-b) in Finland with no other studies contradicting this finding (see Ottelin 2016 for a review of earlier studies). Still, the prevailing urban development principle for reducing GHG emissions from a settlement is to increase its population density, in Iceland as well.

What was found is that the overall average per capita CF in Iceland is approximately 11.3 tons of CO_2e/a (the share within the assessment scope). The CFs are relatively equal between the Capital and Towns at 11.6 and 11.3 t CO_2e/a, but somewhat lower in Villages with 10.2 t CO_2e/a. As was hypothesized, the indirect emissions from services use increase significantly from Villages to the more affluent areas. The average per capita annual consumption increases from 2.3 million ISK in Villages to 2.8 million ISK in Towns and 3.1 million ISK in the Capital and thus it is largely the consumption activity which drives the CFs rather than the settlement type as such, as suggested previously by Minx et al. (2013). With transport, the results are also in line with the hypothesis that higher density reduces private driving, but as in several earlier studies, when all transportation related emissions are accounted for, including flying, the advantage is greatly reduced or disappears.

The CFs in Iceland appear to be relatively high according to the study, given that housing, often one of the most influential categories (Heinonen et al. 2013a-b; Heinonen and Junnila 2011; Jones and Kammen 2011) causes very little emissions due to the low-carbon energy system in Iceland. The estimated Icelandic average CFs are approximately on the same level as those estimated for Finland (Heinonen et al. 2013a; Heinonen and Junnila 2011) even with the very low emissions from housing. In Heinonen and Junnila (2011) the same assessment model was used, so even if there was a bias associated to the model selection, which will be discussed below, the two studies are relatively well comparable.

Affluence plays a key role in explaining the CFs, as has been noticed in number of earlier studies. When we elaborated our analysis with a regression model controlling for expenditure, the Capital appeared to reduce the CFs by 9% and Towns by 5% in comparison to Villages. In interpreting these results, one should not ignore that cities work as engines of growth and affluence, but at least the relative effect of urbanity indicates that moving away from the more urbanized areas might lead to further increases in CFs.

Setting detached house living as a crude indicator of sprawl following Ala-Mantila et al. (2013) and looking at the Capital only, the CFs were found to be the highest for apartment building residents, at a relatively large margin (12.5 t CO2e vs. 9.5 t CO2e). The household type differences and particularly the resulting differences in intra-household sharing and consumption power explain the situation, as aforementioned. Ala-Mantila et al. (2016) and Heinonen et al. (2013a-b) have shown how important the economies-of-scale and the consequent intra-household sharing on the CFs can be, and how difficult it is for small households to live a low-carbon life. In Iceland, these small adult households generally occupy the apartment buildings whereas larger families with children locate to detached houses. Controlling for the income changes the outcome, but only so that there is no statistically significant difference in the CFs between the residents of detached houses and apartment buildings (see Table 2).

Limitations

The uncertainties of the study can be divided into three areas: 1) assessment method related, 2) assessment model related and 3) input data related. The IO LCA method is widely used in consumption-based CF studies due to the complexities of the task. IO LCAs, however, suffer from several weaknesses, the most important ones being aggregation error, homogeneity and linearity assumptions and in single-economy models the assumption that imports are equivalent to domestic production. The aggregation error means that in IO models multiple industries are always comprised to one sector in the model, and since they can have highly varying GHG intensities, the model can randomly under- or overestimate the emissions caused by the production of a certain good. It has been suggested, however, that these aggregation errors cancel out each other in a CF study including a wide variety of goods from different sectors (Su et al. 2010; Wiedmann 2010). The EIO LCA model is also one of the most highly disaggregated model available with its' 428 sectors. Homogeneity and linearity assumptions mean that the model automatically assumes higher expenditure on a certain sector to be linearly associated with the environmental impact, and that all the goods produced in a certain sector have the same impacts. It is for example possible that the more affluent people buy on average more expensive products and can even spend money on environmentally sustainable products, but an IO assessment shows elevated emissions. This problem cannot be avoided easily, but in a study like this the potential errors should not be overly large due to the income differences in overall being relatively low in Iceland, and, in large enough samples, the average product consumed becomes the national average product. Furthermore, according to Girod and de Haan (2010) quality is an important factor and reduces differences between income groups, but higher price still indicates higher emissions. In general IO LCA is not a good method for individual CF assessment, but works well with averages.

The assessment model choice adds uncertainty to the results due to the selected EIO LCA model being based on a foreign economy, the U.S., and the data it contains somewhat old. Iceland imports the vast majority of its goods, and thus a foreign economy-based model is justified. However, a multi-region model would improve the reliability by tracking emissions to the countries where they are actually produced. The fit was improved by using local energy production intensities, which are very different in Iceland from those in the US. There can still be an over-estimation bias, since the intensities of the local services were not amended with the local energy production intensities due to missing data. However, many services are material intensive and the majority of their emissions can often be attributed to offsite inputs rather than the on-site energy use. The fit between the model and the data was also improved by updating the sectoral GHG intensities with sectoral inflation, which for many sectors significantly reduced the intensity per monetary unit. This amendment should work relatively well for such sectors where no major technological changes have taken place. Where such have happened, it is possible that the adjusted intensities inaccurately describe the actual output.

The input data weaknesses were partially discussed already along with data description. The key issue is that the expenditure survey data includes only private consumption, and the values of public free-of-charge or heavily subsidized goods are missing. Monetary benefits, like unemployment payments and child benefits are included, but actual public goods and highly subsidized goods like healthcare are left out. This is a weakness of the study, but likely does not have a great effect on the comparisons between the area types. Residential construction should also be added to future assessments, as discussed previously. The expenditure surveys in general detail the purchases of daily goods, but contain uncertainty related to infrequently purchased durable goods like cars, home electronics, furniture and such. Large-enough samples reduce this problem, but in this study the uncertainty range could not be estimated.

Concluding remarks

When looking at the broader context of this study, consumption-based CF studies can be seen as an important complement to territorial assessments. They show how GHG emissions can largely be outsourced/externalized outside a certain settlement and/or outside the country of consumption. These studies can also capture economy-wide rebound-effects which result when consumption of a certain good is reduced but the money saved is spent on something else which effectively annuls the prior reduction (see e.g. Ottelin et al. 2017). The rebounds can be significant (Murray 2013; Druckman et al. 2011; Wiedenhofer et al. 2013; Ottelin 2016; Ottelin et al. 2017), but can remain unnoticed in sectoral assessments, like those concentrating on ground transport only. In this study, we did not assess the rebounds, but the effect is embedded in the assessment approach.

Consumption-based CF assessments also allow for analyses of the so-called parallel consumption, that is, extending the possessed living space to service spaces around (Heinonen et al. 2013a). Smaller living spaces in denser settlements can easily be compensated with increased use of service spaces, meaning that the overall space requirement for sustaining city center living can be higher than for suburban and rural area residents even though the directly possessed living spaces tend to increase along with distance from the city center.

All these, outsourcing the emissions, the rebound-effects and the parallel consumption phenomenon are mechanisms which make it extremely difficult to reach significant GHG reductions by improving the qualities of human settlements (e.g., with densification). However, by first understanding the issues well enough, the best sustainable solutions can be found. For example, by detecting occasions when rebound-effect turns negative, in other words, when reduced expenditure on GHG intensive goods is properly directed to achieving further GHG reductions (see Ottelin 2016 for further discussion).

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CHAPTER THREE

POLARIZING EVIDENCE OF THE RELATIONSHIP BETWEEN COMPACT CITY AND THE CARBON FOOTPRINT OF CITY RESIDENTS

JUUDIT OTTELIN, JUKKA HEINONEN
AND SEPPO JUNNILA

Abstract

Compact cities, where people live together in closer proximity and higher density, are expected to reduce greenhouse gas emissions. At the same time, these dense urban areas are associated with agglomeration economies, where increasing population correlates with the increasing productivity. Furthermore, population and dense urban areas also correlate positively with wages and housing prices. This is critical to an understanding of emissions sources as income is the main driver of personal carbon footprint and economic growth the main driver of global GHGs. This chapter examines how the compactness of a city is connected to the income and carbon footprints of the residents of a city. We focus on the transport and housing sectors, as these are the emissions that compact-city policies generally target. The study includes the 20 largest cities in Finland and the carbon footprints are calculated with an input-output based hybrid life cycle assessment method and elaborated with regression analysis. The results of the study depict how the compactness of a city is associated with increasing income and increasing carbon footprints. The emissions caused by driving decrease moderately with increasing population and compactness, but the emissions caused by other travel (public transport and holiday travel) increase strongly. The emissions caused by housing energy consumption do not have a statistically significant connection to the population or compactness of a city, even though the living space per capita slightly decreases with these. The results indicate that if decision-makers wish to

build compact cities specifically for the possible economic benefits, they have to understand that this is in contradiction with environmental goals.

Introduction

Compact cities are expected to reduce greenhouse gas (GHG) emissions (Newman & Kenworthy 1989, Burton et al. 2003, Glaeser & Kahn 2010). Reduced automobile dependency and short distances result in lower driving related emissions. Some studies have also suggested lower emissions from housing energy due to smaller apartments (Norman et al. 2006, Ewing & Rong 2008, Glaeser & Kahn 2010). At the same time, dense urban areas are associated with agglomeration economies, increasing population correlating with increasing productivity of a city (Cervero 2001, Glaeser & Gottlieb 2009). Population and dense urban areas also correlate positively with wages and property prices, which may lead to companies relocating away from the densest areas and cause them to lose the gains of shorter travel distances (Gaigné et al. 2012). Furthermore, while transport related emissions are significant, they form a minor part of the overall carbon footprint of a consumer (e.g. Minx et al. 2013, Ottelin et al. 2018, Jones & Kammen 2014). In the end income is the main driver of carbon footprint (Lenzen et al. 2004) and economic growth the main driver of global GHG emissions (Stem 2004).

In this study, we examine how the compactness of a city is connected to its GHG emissions from transport and housing sectors, income and the total carbon footprint (CO_2-eq kg/year per capita) of its residents. We study the 20 largest cities in Finland and test various variables related to the concept of compact-city, including population, population density, and the absolute number and the share of the population living in the inner urban area. The results of the study demonstrate that income is best explained by the population of the city, which is associated with all the other compact-city variables. However, the carbon footprint per capita is more strongly explained by the share of the population living in the inner urban area. When income is not controlled compactness seems to correlate positively with carbon footprint, but negatively with emissions from driving.

More research is needed to elaborate whether the compactness of a city or avoidance of urban sprawl alone have any impact on productivity and income, or if all these variables are simply driven by population. Although it is also possible that higher wages attract people and thus drive population, Glaeser and Gottlieb (2009) have found that the original income level of a city does not predict well the consequent population growth.

Research materials

The study is based on the Finnish Household Budget Survey (HBS) 2012 (Statistics Finland 2012). The survey includes detailed data on household expenditure, based on consumption diaries and interviews. Socioeconomic variables and information about the residential locations are included. The sample size of the survey is around 3,500 households.

Table 1. Sample sizes and descriptive statistics of the 20 largest cities in Finland

	Sample size (hh)	Population 2012	Income (€/year per capita)	Share living in inner urban area	Share of car-free hhs	Avg. hh size	Living space (m2 per capita)
Helsinki	362	598,000	24,000	97 %	50 %	1.8	37
Espoo	146	254,000	25,000	54 %	33 %	2.0	41
Vantaa	116	216,000	23,000	50 %	25 %	2.1	39
Tampere	136	204,000	22,000	67 %	43 %	1.7	41
Turku	107	179,000	21,000	75 %	49 %	1.8	40
Oulu	89	144,000	17,000	45 %	36 %	2.1	40
Jyväskylä	84	132,000	17,000	41 %	34 %	1.9	39
Lahti	64	102,000	18,000	57 %	35 %	1.8	40
Kuopio	71	97,000	19,000	51 %	29 %	2.0	42
Kouvola	67	88,000	21,000	16 %	19 %	1.7	50
Pori	58	83,000	17,000	31 %	35 %	1.9	46
Joensuu	50	74,000	16,000	23 %	40 %	2.0	39
Lappeenranta	58	72,000	18,000	21 %	22 %	2.1	44
Hämeenlinna*	34	67,000	18,000	30 %	27 %	2.4	47
Rovaniemi*	41	60,000	21,000	22 %	16 %	2.1	48
Vaasa*	31	60,000	19,000	46 %	12 %	2.0	41
Seinäjoki*	36	59,000	18,000	17 %	0 %	2.7	38
Salo*	40	55,000	21,000	27 %	17 %	2.0	51
Kotka*	41	55,000	17,000	27 %	28 %	1.8	41
Kokkola*	30	47,000	17,000	19 %	22 %	2.4	43

The study is limited to the 20 largest cities in Finland. The sample sizes and some descriptive statistics of the cities are presented in Table 1. It should be noted that when using the data and according to the HBS data provider, statistical representativeness requires a sample of 50 households or more. Thus, cities with smaller sample sizes are marked with an asterisk. "Inner urban area" refers to the continuously built central area of the city.

The variable is based on the Finnish Environment Institute's national urban-rural classification (Helminen et al. 2014).

Research methods

This chapter presents the research methods applied in the study. First, we present the hybrid-LCA method used to calculate the carbon footprints. Then we describe the regression analysis approach. We use regression analysis to demonstrate the relationship between carbon footprint and various explanatory variables.

Carbon footprint model

The carbon footprint model of the study is based on the environmentally extended input-output (EE IO) model of the Finnish economy called ENVIMAT (Seppälä et al. 2009, Seppälä et al. 2011). Input-output model of an economy describes monetary transactions between economic sectors. In an environmental extension of the model, environmental indicators such as GHG emissions are attached to the model (Leontief 1970). In theory, all the emissions caused within the economy are included and can be allocated for each economic sector so that all the upper-tier emissions are included. Upper-tier emissions are the emissions released in the earlier life-cycle phases. This is why some practitioners call it the economic input-output life-cycle assessment (EIO-LCA) (e.g. Hendrickson et al. 1998).

EE IO models suffer from aggregation error due to the often low amount of included economic sectors. The accuracy can be improved by integrating process-LCA data from some main processes into the model (Suh et al. 2004). These integrated models are generally called hybrid-LCA models.

The carbon footprint model of the study includes process-LCA data on the direct emissions from city wide energy production (housing energy) and motor fuel combustion, which constitute a large share of the carbon footprint. Housing energy payments embedded in rents and housing management fees were separated using statistics from the financial statements of the housing companies in Finland (Statistics Finland 2015). These national statistics are provided distinctly for row (terrace) houses and apartment buildings in accordance with the decade of construction. The emissions from the construction of buildings are based on living space (m^2). More details of the model are presented by Ottelin et al. (2015).

We calculated the average personal carbon footprint for the 20 largest cities of Finland, and studied these city carbon footprints further with regression analysis. The carbon footprints are measured in CO_2-eq kg/year per capita throughout the study.

Regression models

The relationship between personal carbon footprint, income and other variables have been tested with various linear and log-log regression models in the previous literature (Weber & Mathews 2008, Lenzen et al. 2004, Lenzen et al. 2006, Shammin et al. 2010, Ala-Mantila et al. 2014). For example, Lenzen et al. (2004) and Weber & Mathews (2008) suggest the following general form:

$$\ln(\mathrm{CF}) = \beta_0 + \beta_E \ln(\mathrm{E}) + \beta_{hhs} \ln(\mathrm{HHS}) + u, \qquad (1)$$

where CF is carbon footprint, E is income, HHS is household size (number of persons) β_0 is regression constant, β_E and β_{hhs} are regression coefficients and u is error term. Equation 1 is the starting point of the regression models employed in the study.

The idea of agglomeration economies within cities is based on the idea that urban density speeds up the flow of ideas and increases business opportunities and productivity, which can either show up in higher incomes or increasing population, depending on housing supply elasticity (Glaeser and Gottlieb 2009). Glaeser and Gottlieb (2009) suggested the following connection between population and productivity of a city:

$$A_t^i = a_t^i (N)^{\omega}, \qquad (2)$$

where A is a city (i) and time (t) specific productivity variable, a is a parameter, N is current population and ω is treatment effect of population on productivity.

Our goal was to examine the relationships between compact-city, income and personal carbon footprint. First, we tested four different compact-city variables: population, population density, the absolute number and the share (percentage) of the population living in the inner urban area of a city. For the sake of readability, we refer to the share of the population living in the inner urban area of a city as "the compactness of a city." We examined the relationship between the compact-city variables and the citizens average carbon footprint, income and household size. Since income and household size are the main drivers of carbon footprint (equation 1), it was important for our analysis that we also tested the relationship between the compact-city variables and the other potentially influential variables listed in Table 1.

From the four tested variables, we chose two for further analysis: the one that had the highest explanatory power (R^2) related to income and the one that had the highest explanatory power related to carbon footprint. These two were used in a consequent set of regression models, describing their impact on the following set of variables: (1) car-free population of the city (percentage), (2) emissions caused by motor fuel consumption, (3) emissions caused by other travel (public transportation and holiday travel), (4) living space per capita and (5) emissions caused by all housing energy.

Besides the log-log models presented in the results section, we tested half-log models and linear models as well. However, we only present the results for the model that gives the highest explanatory power (R^2). The model with the share of the population living in the inner urban area of the city, as the explanatory variable, is an exception. It is the only variable, whose regression models had in some cases higher explanatory power when the logarithmic transformation was not used. However, this was not true in all cases, and thus we present the regression analysis results for both the log-log model and direct linear model.

Results

The main results of the study are (1) income and personal carbon footprint increase with increasing population, density, and the compactness of a city and (2) the decrease in emissions caused by reduced motor fuel consumption is not strong enough to compensate for this. We describe the results in more detail below. The results are divided in two parts: regression models and illustrations.

Regression models

Table 2 depicts the regression analysis results for the relationship between the studied compact-city variables and dependent variables including the average personal carbon footprint, income and household size. Four compact-city variables were tested: population, population density, and the absolute number and the share of population living in the inner urban area of the city (percentage).

In the case of carbon footprint as the dependent variable, the basic model with income and household size as explanatory variables gives the highest explanatory power ($R^2 = 0.65$). Carbon footprint increases with the increasing average income of the city and decreases with the increasing average household size of the city. The tested compact-city variables have generally quite low explanatory powers (R^2 ranges from 0.24 to 0.34) regarding carbon footprint. The highest explanatory power ($R^2 = 0.34$) is given by the share of population living in the inner urban area of the city. In all cases, the compact-city variables correlate positively with carbon footprint and income and negatively with household size, although the result is not statistically significant ($p < 0.05$) for population in the case of household size. In the case of income, the population of the city has the highest explanatory power ($R^2 = 0.41$). These two categories together—Food and Transport—are responsible for well over 50% of the overall CFs.

Services play an important role as well, adding almost three tons to the CFs of Capital residents, 2.8 t CO_2e. In Towns they add 2.5 tons to the CFs, but in Villages only 1.9 tons. This is partially due to the income effect, the more affluent residents being able to purchase more services. However, it also follows the hypothesis of Heinonen et al. (2013a) that in denser areas residents actually make a trade-off between possessed living space and services in close proximity, which can be used to extend the living space. This means that they accept smaller living spaces in exchange for the better service level of the surrounding areas, and spend less time at home and more time away using these services, such as restaurants, cafés, gyms, theatres and so on. Still the share of services is relatively high even in the least urbanized areas suggesting that even if service consumption might be a preferable option to the consumption of physical goods, many services actually are very material-intensive and have relatively high GHG intensities. Particularly cafés and restaurants and cultural services are used more in the Capital, where their availability is the greatest. Housing and physical goods have the smallest shares, but especially with physical goods the emissions are significantly lower in the least urbanized settlements.

Since the population of the city has the highest explanatory power regarding income and the share of population living in the inner urban areas highly explains carbon footprint, we chose them for further analyses. We examined their relationship with the following variables: the share of car-free population living in the city, the emissions caused by the consumption of motor fuel, the emissions caused by other travel (public transport and holiday travel), average living space per capita and the emissions caused by the consumption of housing energy. Table 3 presents the results for the travel behavior related variables and Table 4 the results for the housing related variables.

Table 1. Results from the regression analyses with carbon footprint, income and household size as dependent variables.

Dependent variable	**ln (carbon footprint per capita)**			**ln (income per capita)**			**ln (average household size)**		
Basic model	**Model 1a**	**R2 =0.65**		**Model 1b**	**R2 =0.08**				
	Coef.	*Std. Err.*	*p > |t|*	*Coef.*	*Std. Err.*	*p > |t|*			
ln (income per capita)	0.27	0.09	0.007	-	-	-			
ln (average houshold size)	-0.35	0.10	0.003	*-0.32*	*0.25*	*0.215*			
constant	6.75	0.89	0.000	10.09	0.18	0.000			
Model 2	**Model 2a**	**R2 =0.24**		**Model 2b**	**R2 =0.41**		**Model 2c**	**R2 =0.19**	
	Coef.	*Std. Err.*	*p > |t|*	*Coef.*	*Std. Err.*	*p > |t|*	*Coef.*	*Std. Err.*	*p > |t|*
ln (population)	0.06	0.02	0.030	0.13	0.04	0.002	*-0.08*	*0.04*	*0.056*
constant	8.53	0.28	0.000	8.37	0.42	0.000	1.60	0.44	0.002
Model 3	**Model 3a**	**R2 =0.24**		**Model 3b**	**R2 =0.22**		**Model 3c**	**R2 =0.21**	
	Coef.	*Std. Err.*	*p > |t|*	*Coef.*	*Std. Err.*	*p > |t|*	*Coef.*	*Std. Err.*	*p > |t|*
ln (population density)	0.02	0.01	0.029	0.04	0.02	0.038	-0.04	0.02	0.042
constant	9.07	0.05	0.000	9.67	0.09	0.000	0.87	0.08	0.000
Model 4	**Model 4a**	**R2 =0.29**		**Model 4b**	**R2 =0.36**		**Model 4c**	**R2 =0.23**	
	Coef.	*Std. Err.*	*p > |t|*	*Coef.*	*Std. Err.*	*p > |t|*	*Coef.*	*Std. Err.*	*p > |t|*
ln (inner urban population)	0.04	0.01	0.014	0.07	0.02	0.006	-0.05	0.02	0.033
constant	8.80	0.14	0.000	9.13	0.24	0.000	1.23	0.23	0.000
Model 5	**Model 5a**	**R2 =0.33**		**Model 5b**	**R2 =0.29**		**Model 5c**	**R2 =0.24**	
	Coef.	*Std. Err.*	*p > |t|*	*Coef.*	*Std. Err.*	*p > |t|*	*Coef.*	*Std. Err.*	*p > |t|*
inner urban population (%)	0.20	0.07	0.008	0.33	0.12	0.015	-0.26	0.11	0.030
constant	9.11	0.03	0.000	9.74	0.06	0.000	0.80	0.05	0.000
	carbon footprint per capita			income per capita			average household size		
Model 6	**Model 6a**	**R2 =0.34**		**Model 6b**	**R2 =0.29**		**Model 6c**	**R2 =0.23**	
	Coef.	*Std. Err.*	*p > |t|*	*Coef.*	*Std. Err.*	*p > |t|*	*Coef.*	*Std. Err.*	*p > |t|*
inner urban population (%)	2012	659	0.007	6594	2431	0.014	-0.56	0.24	0.031
constant	9000	303	0.000	16779	1118	0.000	2.24	0.11	0.000

Note: Statistically insignificant ($p > 0.05$) results are *italicized*.

Table 2. Regression analyses with car-free population, emissions caused by motor fuel consumption and emissions from other travel as dependent variables.

Dependent variable	**car-free population (%)**			**ln (CF motor fuel)**			**ln (CF other travel)**		
Model 2	**Model 2d**	**R2 = 0.50**		**Model 2e**	**R2 = 0.31**		**Model 2f**	**R2 = 0.29**	
	Coef.	*Std. Err.*	$p > \|t\|$	*Coef.*	*Std. Err.*	$p > \|t\|$	*Coef.*	*Std. Err.*	$p > \|t\|$
ln (population)	0.11	0.03	0.001	-0.15	0.05	0.011	0.52	0.19	0.015
constant	-1.05	0.30	0.002	8.79	0.61	0.000	*0.33*	*2.24*	*0.884*
Model 5	**Model 5d**	**R2 = 0.58**		**Model 5e**	**R2 = 0.29**		**Model 5f**	**R2 = 0.28**	
	Coef.	*Std. Err.*	$p > \|t\|$	*Coef.*	*Std. Err.*	$p > \|t\|$	*Coef.*	*Std. Err.*	$p > \|t\|$
inner urban population (%)	0.35	0.07	0.000	-0.44	0.16	0.014	1.55	0.59	0.017
constant	*0.05*	*0.03*	*0.155*	7.23	0.07	0.000	5.72	0.27	0.000
				CF motor fuel			**CF other travel**		
Model 6				**Model 6e**	**R2 = 0.25**		**Model 6f**	**R2 = 0.41**	
				Coef.	*Std. Err.*	$p > \|t\|$	*Coef.*	*Std. Err.*	$p > \|t\|$
inner urban population (%)				-483	199	0.026	1000	281	0.002
constant				1371	91	0.000	*265*	*129*	*0.055*

Note: Statistically insignificant ($p > 0.05$) results are *italicized*.

Population and the share of inner urban population have strong positive relationships with the increasing share of car-free population ($R^2 = 0.50$ and $R^2=0.58$, respectively). They also correlate negatively with the emissions from motor fuel consumption and positively with the emissions from other travel. The non-log model with the share of inner urban population as explanatory variable gives the highest explanatory power ($R^2 = 0.41$) for the emissions from other travel. In the case of motor fuels, however, the natural logarithmic model with population as explanatory variable provides the highest explanatory power ($R^2 = 0.31$). The regression coefficients are higher for the emissions caused by other travel than for the emissions caused by consumption of motor fuel in all cases, suggesting a steeper slope.

The average living space per capita declines with increasing population and share of population living in the inner urban areas. However, the emissions caused by housing energy consumption do not decrease—these regression coefficients are positive, although statistically insignificant.

Table 3. Regression analyses with living space per capita and emissions caused by housing energy consumption as dependent variables.

Dependent variable	**ln (living space per capita)**			**ln (CF housing energy)**		
Model 2	**Model 2g**		**R2 = 0.27**	**Model 2h**		**R2 = 0.03**
	Coef.	*Std. Err.*	$p > \|t\|$	*Coef.*	*Std. Err.*	$p > \|t\|$
ln (population)	-0.07	0.03	0.020	*0.03*	*0.05*	*0.486*
constant	4.58	0.33	0.000	7.34	0.53	0.000
Model 5	**Model 5g**		**R2 = 0.29**	**Model 5h**		**R2 = 0.08**
	Coef.	*Std. Err.*	$p > \|t\|$	*Coef.*	*Std. Err.*	$p > \|t\|$
inner urban pop. (%)	-0.23	0.08	0.014	*0.17*	*0.13*	*0.227*
constant	3.84	0.04	0.000	7.64	0.06	0.000

Illustrations

Figure 1 illustrates the relationship between population, average income and average carbon footprint of the residents. Figure 2 illustrates the same relationships for the share of inner urban population. As one can observe, the relationships are rather similar: income and carbon footprints increase with population and compactness, but not dramatically. Perhaps the following pairs of figures are more striking. Figure 3 presents the relationship between population and the emissions caused by motor fuel consumption and Figure 4 the relationship between population and the emissions caused by other travel (public transport and holiday travel). Figures 5 and 6 provide the same illustrations for the share of inner urban population. While the emissions caused by motor fuel consumption decrease moderately with increasing population and compactness, the emissions caused by other travel increase strongly at the same time.

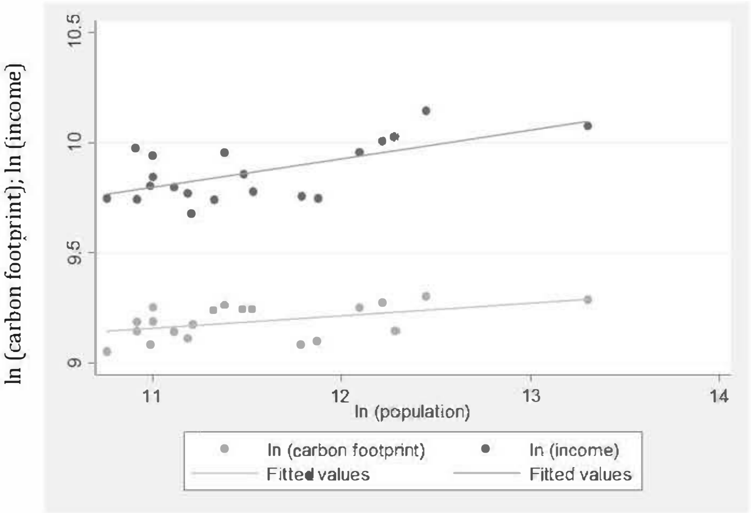

Figure 1. Relationship between population, income (€/year per capita, natural log) and carbon footprint (CO_2-eq kg/year per capita, natural log).

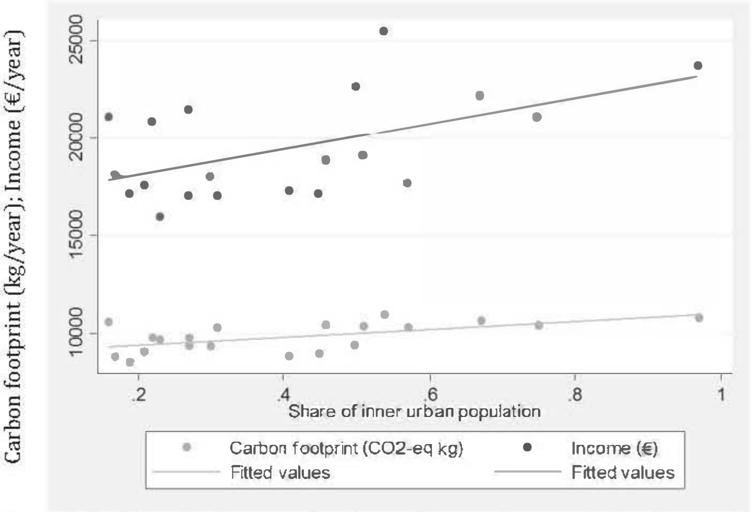

Figure 2. Relationship between the share of inner urban population, income (€/year per capita) and carbon footprint (CO2-eq kg/year per capita).

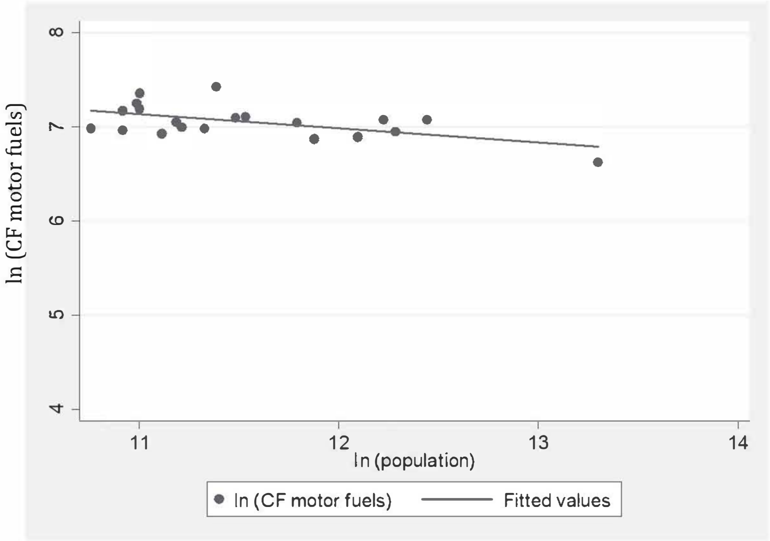

Figure 3. Relationship between population and the emissions caused by motor fuel consumption (CO_2-eq kg/year per capita, natural log).

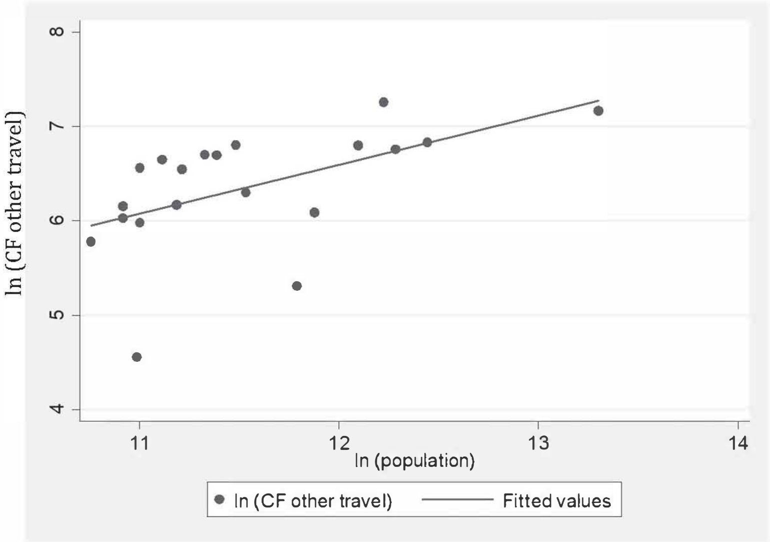

Figure 4. Relationship between population and the emissions caused by other travel (CO_2-eq kg/year per capita, natural log).

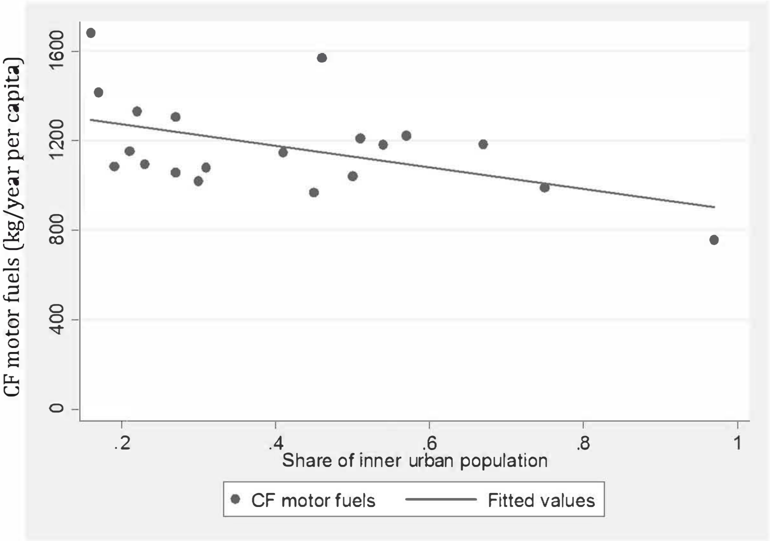

Figure 5. Relationship between the share of inner urban population and the emissions caused by motor fuel consumption (CO_2-eq kg/year per capita).

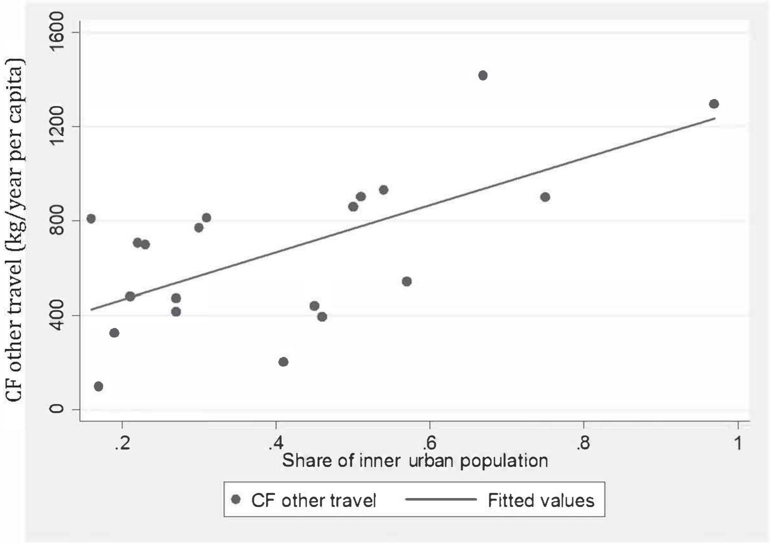

Figure 6. Relationship between the share of inner urban population and the emissions caused by other travel (CO_2-eq kg/year per capita).

Discussion and conclusions

The purpose of the study was to illustrate how the compactness of a city is connected to the income and carbon footprints of the residents of the city. The emissions from transport and housing were studied separately, since these are the emissions that the compact-city policies generally target. The study included the 20 largest cities in Finland.

The results of the study depict how compact-city variables are associated with increasing income and increasing carbon footprints. The emissions caused by driving decrease moderately with increasing population and compactness, but the emissions caused by other travel (public transport and holiday travel) increase strongly. The emissions caused by housing energy consumption do not have a statistically significant connection to the population or compactness of the city, even though living space per capita slightly decreases with these. This can be explained by the low incentives for energy saving measures for urban apartment residents in Finland, who typically pay energy fees embedded in rents and housing management charges (Kyrö et al. 2011), and the higher amount of heated and lit common spaces (Heinonen & Junnila 2014).

The results demonstrate the problematics of studying the impacts of increasing density within cities. Though the compactness of a city is closely related to the population of the city, the current theories on agglomeration economies do not clearly state whether population or density would be the main driver of the economic benefits (Glaeser & Gottlieb 2009). Furthermore, economists highlight that using population as an independent variable is suspicious, since the average wage level of a city is likely to impact people's choice of residential location. Thus, there appears to be a causal loop: population increases income and increasing income increases population. Separating the impact of density on income is not a simple task, but important considering the belief that compact-cities are expected to reduce greenhouse gas emissions. While the emissions caused by car-use can be reduced by compact-city policies, the impact on total emissions seems to be the opposite if compactness is considered as a driver of income. Even if there are other important factors as well, the relatively small reductions in automobile related emissions are easily overridden by even a small increase in income, which is the main driver of carbon footprints. If density does have its own impact on income, and we wish to build compact cities for this economic reason, we have to give up the naïve belief that compact cities are ecologically sustainable as such. Radical measures are needed to make compact cities ecologically sustainable, and the emissions from car-use only play a minor role in such development.

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CHAPTER FOUR

TOWARDS SUSTAINABLE CONSUMPTION OF AUTOMOBILITY

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Abstract

The car is probably the consumer product with the greatest environmental impact. The debates surrounding sustainable automobility almost exclusively regard the car as a transport mode, yet the functionality of the car extends well beyond its transport role into cultural, social, psychological and institutional realms. Without addressing these other aspects, automobility is unlikely ever to become sustainable. Much of the environmental impact of the automobile may be attributed to overproduction prompted by the current dominant mass production system. At the same time, overconsumption prompted by our inability to develop longer term relationships with most of our objects, including ‘consumer durables’, is interwoven with this overproduction.

In order to address this complex set of issues, this contribution will draw on a higher level analysis of the automobility system, combining a deep insight into the car industry with aspects of design, consumption and more recent thinking about our relationship with the objects around us, drawing on the work of thinkers such as Morton (2010, 2013), Bogost (2012), Vogel (2015) and the lesser known work by Spyker (2007). The basic notion being that if we gain a better understanding of our human place on this planet and how this relates to the place of other entities on this planet, we may also gain a better understanding of our relationship with our objects and how we can enhance such relationships into more durable relationships, thereby reducing the need for their premature replacement, thus consuming fewer, higher value objects.

Background

It is not difficult to imagine the car as the consumer product with the greatest environmental impact.” Regulation of this impact, particularly in terms of toxic emissions dates back to the early 1960s. The State of California took an early lead in this area, closely followed by US Federal legislation, with other jurisdictions, notably Japan and the EU, following not far behind. In recent years, China has also started to develop its own standards, along with South Korea and other more recently motorizing countries (Nieuwenhuis and Lin 2015). The concern surrounding the automotive impact on climate change, particularly through emissions of carbon dioxide, really began in the 1990s and in the wake of the 1997 Kyoto Protocol, the EU took an early lead in this area. This was followed by action in other jurisdictions, sometimes framed in terms of fuel economy, building on the principle of CAFÉ (Corporate Average Fuel Economy) regulation initiated in the US in the 1970s. Other automotive impacts that have seen regulation include end-of-life as in the EU’s directive.

However, this narrow concern with, primarily, vehicle emissions distracts somewhat from the broader range of impacts of the car “system” and its central role in our unsustainable economic growth model, as well as its pivotal role in dependence on oil, which drives many aspects of global politics.[1] These aspects make the car system central to any attempts to move towards more sustainable consumption and—closely linked with this—production. This chapter is a more philosophical tract that will first provide a brief overview of the more conventional perspective of the car system’s impact on the environment; it will then move beyond this to more technological perspectives to the human emotional relationship with the car and set this in the context of our broader relationship with the natural environment.

The car’s environmental impacts

Although some of the dangers of the car were recognized in its origins, the car was initially welcomed as a cleaner alternative to the horse.[2] Cars leave little solid waste, but the horse system created the need to remove horse manure, urine and horse carcasses on a daily basis. By 1900, the UK had 3.5 million horses, of which 1.5 million in urban areas. The use of private carriages, the Victorian equivalent of private cars, had increased dramatically in the second half of the 19th century to serve a growing middle class. In addition, horses run on biofuel and the fuel to run each horse could instead feed six to eight people; a pertinent issue in the context of urban deprivation at the time. Cars by contrast had none of these problems and in addition, allowed users to escape the "miasma" of the city, much as the bicycle had done a few years earlier (Nieuwenhuis 2014).

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[1] When I use the terms *we* or *our*, I am referring to most of humanity, but more so a dominant and “modern” peoples entangled in highly energy-intensive production and consumption behaviors that though now global had its origins and development in the West.

[2] Having spent many years in this field, I do not cite much of my knowledge as it is considered common.

Nonetheless, some were concerned; French journalist Hospitalier (quoted in Nieuwenhuis et al. 1992) expressed the belief in the 1890s—with unusual foresight—that internal combustion vehicles had no place in urban environments, instead arguing that electric vehicles were more appropriate. The dust thrown up by cars on unpaved rural roads was a concern too, being the subject of one of the first environmental measures implemented by the car industry: "dustless" cars. Increasingly, paving of roads made this issue less relevant, although it persists in many parts of the world, usually well away from urban areas. As car use increased, the emissions from internal combustion engined cars, which had come to dominate the market since the invention of the "self-starter" in 1912, became another area of concern.

Car ownership in key markets increased dramatically between 1910 and 1938 (Nieuwenhuis and Wells 2015, Ch. 13). By the 1930s, Southern California had achieved the highest levels of car ownership in the world. This, combined with specific natural conditions in the Los Angeles basin, created the first area where the impact of vehicle emissions became evident. The brown haze Southern Californians began to notice in the 1940s was due to various toxic emissions from cars, combining both tailpipe emissions with other emissions. With cars of the 1930s, 1940s and 1950s, tailpipe emissions represent about 70% of total emissions, the remainder being made up of evaporative emissions from the fuel system, especially in the hotter climate of this area (Brilliant 1989). Of the exhaust emissions, some 97% were in fact harmless, including water vapor and carbon dioxide, which is not a toxin. In addition, the engines emitted oxygen that had not been used in the combustion process, and nitrogen that was freed by the heating of air ingested by the engine.

Only 3% is therefore toxic. These toxic emissions consist of carbon monoxide, oxides of nitrogen, a range of hydrocarbons, particulate matter and sulphur dioxide and trioxide. Carbon monoxide (CO) is a product of incomplete combustion. It is poisonous to humans, but in the atmosphere will turn to carbon dioxide ($CO2$) in a matter of hours. The oxides of nitrogen (NOx) generated by the combustion process are produced by the heating of air in the engine, rather than any reaction with the fuel used. These consist of nitrogen dioxide (NO_2), nitrous oxide (N_2O) and nitric oxide (NO). Nitric oxide is associated with respiratory problems and acid rain and is also a tropospheric ozone precursor—it reacts to form the photochemical smog identified by Californians. Nitrous oxide is a greenhouse gas 300 times stronger than CO_2. These days, NO_x are much more of a problem from diesel than petrol engines and within the EU, where regulation in recent years has focused on reducing CO_2, they consequently enjoy less severe restrictions on these pollutants than petrol engines; although this is not the case in the US, where toxic emissions and human health have been of primary concern.

Most toxic are the various hydro-carbons that are both unbumt elements of the fuel, as well as resulting from the reaction of the fuel with elements in the air, notably oxygen. However, most of it involves unbumt fuel and can include up to 300 different substances, including aldehydes such as toluene, xylene and benzene, a carcinogen with no safe limit. Particulate matter has increasingly become associated with various forms of cancer, as due to their small size, these fine particles can be easily ingested and lodge deep inside the lungs. They consist of emission chemicals bound with small dust particles, made up of soot, rubber, unbumt oil and fuel, sulphates and wear debris from the engine. They are categorized as PM10 if less than 10 microns in diameter and PM2.5 if less than 2.5 microns. Sulphur dioxide (SO_2) and trioxide (SO_3) are also mainly a diesel engine problem and they are due to the sulphur content of fuel, which gradually rose from the 1930s onwards (Kitman 2000). With the more recent advent of low sulphur fuels for cars and trucks this has largely disappeared, although it is still a major problem of marine bunker fuel, something that is only now being addressed.

As we progress through the 21st century, two principal threats are of concern. First is the question of climate change, the other is the peaking of key resources of energy, notably oil (Heinberg 2007). Car use represents a major contribution to both these looming crises. The public appears blissfully unaware of the latter, being lulled into a false sense of security by periodic falls in the price of oil; a feature of the price volatility expected after a resource peaks and adjustments are made in the wider economy and, more recently, also of the adoption of processes such as fracking and the exploitation of tar sands in North America, which has increased the supply of oil. Climate change skepticism is also rife, informed perhaps not so much by the science, as by the fact that most people cannot conceive of a world without ready access to their car.

Today more than half of all oil consumed worldwide is used to transport people and goods, as well as providing services, making the transport sector as a whole 95% dependent on oil (Kendall 2008; Dennis and Urry 2009). This means that transport and logistics—the lifeblood of our economies—are almost totally dependent on oil. In reality this constitutes a very high risk strategy that makes the risks taken by our financial institutions in recent years look trivial by comparison. It also makes "business-as-usual" the highest risk strategy. The current notion is that after oil peaks, the gap will be filled by GTL (gas-to-liquid) and CTL (coal-to-liquid) technologies, thus further perpetuating our dependence on both high carbon energy sources and liquid fuels (Sperling and Gordon 2009; Kendall 2008). Cars are thus an integral part not only of our unsustainable economic growth model, but also of our geopolitical system, as the need for access to oil drives many a foreign policy decision. It is fair to say that in many respects and in many countries, we have become addicted to automobility, yet our relationship with cars is fraught and fickle.

Beyond the obvious

The debates surrounding sustainable automobility tend to focus on the obvious impacts outlined above and nearly always take a technological view. From this perspective, environmental impact is a technical problem and its solution is technological and it is true that the inevitable move towards greater electrification of automotive powertrains will ease a number of environmental impacts. In addition, however, this perspective almost exclusively regards the car as purely a mode of transport, yet the functionality of the car extends well beyond its transport role into cultural, social, psychological and institutional realms (see Boucher, this volume). Without addressing these other aspects, automobility is unlikely ever to become sustainable. Much of the environmental impact of the automobile may be attributed to overproduction prompted by the current dominant mass production system. At the same time, overconsumption prompted by our inability to develop longer term relationships with most of our objects, including "consumer durables," is interwoven with this overproduction, making the idea of SCP (sustainable consumption and production), first mooted at the 1992 Rio Earth Summit, a far-off pipedream.

In order to address this complex set of issues, we need to move beyond the obvious technological and economic approaches, considering aspects of design, consumption and more recent thinking about our relationship with the objects around us, drawing on the more philosophical work of thinkers such as Morton (2010; 2013), Bogost (2012), Vogel (2015) and the lesser known work by Spyker (2007). The basic notion being that if we gain a better understanding of our place on this planet and how this relates to the place of other entities on this planet, we may also gain a better understanding of our relationship with our objects and how we can enhance such relationships into more durable relationships, thereby reducing the need for their premature replacement, thus consuming fewer, higher value objects. Such considerations become even more pertinent in the context of proposed moves towards automated cars, which would lead to even greater alienation of the consumer from the product, which would become further "commodified." A clear distinction between "cars" and "automated cars" is therefore needed, as the latter effectively constitute a new and different transport mode from the cars we know and is likely to develop in parallel, rather than replace the driven car. I will focus here on the car. For a deeper discussion of automated cars, as well as an alternative view, Sperling (2018) is a useful source.

Nature and us

Over the centuries, we have come to think not only of humans as separate from the rest of creation, but also of human-made objects as quite distinct from natural objects. This is a curious distinction; we do not think of ant hills, termite mounds, bird's nests, the "bowers" of bower birds or beaver dams in the same way, so what is so different about us? Many species change their environment to suit their own needs, or perceived needs. Also, other species often share our destructive nature, albeit on a more modest scale. We are in truth part of nature, so why do we believe our creations are somehow not? This section will explore how a change in these perceptions can help in making our activities generally more sustainable. In this, particular reference is made to the car.

We humans have become deeply intertwined with our technology, such that it is not difficult view humans and their technology combined as constitutive of the species. Technology is a natural human characteristic; we would now struggle to survive without cooking our food, which requires the technology of controlling fire; kill much of our prey, which requires the technology of weapons and traps; or grow our crops, which requires the technologies of tools to work the soil and harvest plants. To a large extent we have therefore co-evolved with our technologies; we make them suit us and in return adapt to them such that we increasingly suit them (Spyker 2007); humans thus "evolved" to drive cars. Our control of fire allowed us to keep predators at bay, change our environment and cook our food (Lipton and Bhaerman 2011), similarly, our stone tools did a job for us and then we adapted to become better at making and using them (Reardon 2013). What is true in our relationship with fire and stone tools is true for all our technologies, all our creations ranging from an arrow-head to an iPhone. I will in turn argue that technology is part of our nature and technology is thus a natural phenomenon. We shape it and in turn we are shaped by it.

Field and Conn (2007) assert that what does distinguish us from the rest of creation—as far as we are aware—is the fact that we have foresight and insight. Given the natural laws, to which we are subject, we can therefore—unlike other species—determine possible solutions to the various environmental problems that result from our activities and act upon them. These abilities in themselves are part of our "nature," but they can be "...used to precipitate death as well as to sustain life..." (Field and Conn, 2007, 343). Is it possible that once having "precipitated death," we eventually see sense as part of nature's mechanism to maintain equilibrium, and therefore change tack and proceed to "sustain life"?

Walker and Salt (2006) explain that natural systems can achieve equilibrium in various different states, of varying stability. Some of these are more suited to us than others and these are therefore more desirable to us; they ensure or facilitate our survival or comfort. However, the system, or indeed the planet can exist in any of these states; any of these can be stable in its own way. Therefore, we very often seek to stabilise a particular natural state because it brings those ecosystem benefits we are after. Even when we protect nature, we are therefore shaping it.

This goes well beyond much current environmental thinking, which is governed by a "conservation" ethos. In an ever-changing world, this is an unrealistic approach. Much better to aim to understand the dynamic processes on our planet—of which we are an integral part—and work with those to achieve our own aims, but balance these with the needs of everything else that contributes to those systems. As Krebs (2008) argues, we need to abandon our current "economic world view" and transform our thinking quite fundamentally into an "ecological world view." This implies a significant, but necessary transition, if we genuinely want to make our systems both sustainable, and, more importantly, resilient.

This approach also exposes the fallacy of the "triple bottom line," a neat device to bring those steeped in that "economic world view" on board of the broader environmental agenda as part of an "eco-efficiency" approach, but in reality a misguided view, as these three elements, the economic, social and environmental are not linear, but hierarchical; society operates within the constraints of the natural environment, while economic activity is something societies engage in for the optimum allocation of scarce resources and eco-efficiency can only ever achieve a tinkering around the edges of these real issues.

Respecting our stuff

One place to start with this transition is in our relationship with our objects. Much of overproduction and overconsumption seem due to our inability to respects our things, which makes them seem more disposable than they should be. Premature disposal triggers more demand and results in more production: overproduction and overconsumption are the result. On an ethical level, Kohak (1985, 35-36) explored the intrinsic value of objects and hence our inherent moral obligations towards our artifacts:

> Artifacts are not only products but also gifts, be it of God or of Nature. Their being has been bought at a price, be it of animals slaughtered, trees felled, ore mined. A gift, though, requires gratitude as a response. It is surely one of the most elementary prima facie obligations to treat a gift with respect…It might, to be sure, sound farfetched to speak of my moral obligation to an aluminum beer can discarded by the road side, yet that obligation is real. That aluminum, embodying both a prodigious amount of labor and a part of God's creation or, in a secular metaphor, a non-renewable natural resource, is a gift. Though it might be my privilege to use that resource, that gift, it is immoral for me to waste it.

So, how is this relevant to cars? Car manufacturers use various ways to discourage owners from working on their cars. This is perceived as alienating by many owners and classic car use, as explored by Nieuwenhuis (2008 2014), is to some extent a rebellion against this aspect of modern car consumption, a "consumer pathology," or a recovering of what has been called by Edward Felten: "Freedom to tinker" (www.freedom-to-tinker.com). His concept, emerging from the IT world, has a long pedigree in a tradition of people's relationships with their products. This alienation is a barrier to the potential user/object relationship and the prospects for a long-term relationship therefore seem doomed from the start. In a consumer society, suppliers of consumer goods may, of course, find this desirable; the sooner customers get bored with a product because they have failed to form a long-term relationship with it, the sooner they will seek its replacement.

It is natural for us to want to influence, or change, our environment. We adapt our environment to suit us. In this context, to be presented with a product that discourages input from us is, in a real sense, "unnatural." In the early years of the car, user input was commonplace (Franz 2005). Crawford (2009) explores the benefits for people to maintain a balance between manual and mental activities and argues that trying to diagnose a technical problem in a car is no less an intellectual exercise than working on an academic theory. He points out that while many manufacturing jobs may have left our shores to newly industrializing countries: "If you need a deck built, or your car fixed, the Chinese are of no help, because they are in China." Globalization has led to a freer exchange of capital and goods, but of people, not as much. Making sure such repair skills are retained and developed near where the product is used is therefore crucial. Being able to fix things and maintain them is an important part of any social or economic system. In addition, people make a living enhancing and modifying products, notably cars. Despite globalization, some jobs have to be kept close to the end-user, that is why we still have doctors, dentists, hairdressers, builders, baristas and car mechanics locally. Local activities provide control, understanding, input. Morton (2010) derides the localism and anti-globalism of many environmentalists, but the fact remains that certain things are better done locally, although global awareness and connectedness are no doubt also important as the "mesh" of interconnectedness is indeed global.

Franz (2005) explains that the history of automotive tinkering is as old as the car. She shows that in the early decades of automotive history, amateur tinkerers played an active role in the development of the car; how consumers "reinvented" the early automobile, as she puts it in her subtitle. At that time, their innovations were as likely as those generated by professionals to find their way into a next generation of car and this was actively encouraged by many commentators. She cites social psychologist Donald Norman, who argues that "…tinkering is a common and often overlooked practice that increases the fit between a device and its users; it corrects design failures or shortcomings that engineers are often unable to anticipate" (Franz 2005, 14). In addition to such amateur input there was a flourishing aftermarket in gadgets, gauges and instruments to fill the many gaps in specification left by manufacturers who had become so in awe of the new mass production technologies and its need for a standardized product that they often forgot that customers are not standardized. Franz (2005, 26) quotes Harold Schertzer, a contemporary commentator on the car industry: "Careless and short-sighted policies of manufacturers have brought protest from the automobile public in the form of accessories, accessory dealers and accessory advertisements."

It now seems like a lost business opportunity that Ford supplied his Model T as such a basic device that a large and comprehensive mail order industry grew up to allow his product to match more closely what people actually wanted. Instead, Ford allowed much of his potential earnings to go to this new "aftermarket" subsector. Only with the Budd system, and especially with the advent of monocoque construction (Nieuwenhuis and Wells 2007), did a significantly more restrictive car format develop, that in turn allowed a further expansion of the aftermarket subsector, albeit that a new professionalism set in which increasingly excluded amateur tinkerers from the innovation and creation process. Franz adds to this a trend whereby auto industry professionals increasingly attempted to recover any ground lost to amateur tinkerers by creating a myth of the need for professional input whereby highly trained professionals were best placed to develop what consumers wanted, without significant input from those consumers, who were, after all, mere amateurs. Franz (2005, 130) concludes that under the new culture that developed gradually during the 1920s and 1930s "In the eyes of the industry the perfect consumer did not tinker, but rather told the manufacturer what he or she wanted and then waited to receive the benefits of the 'holy trinity' of the modern age: science, industry and progress," a model we are still familiar with today and that may, in some respects at least, be exacerbated by the move to greater electrification. Electric vehicles are not only likely to need less maintenance, their high on-board voltages also present new dangers to any would-be tinkerer. The Tesla model of "over the air" software upgrades also includes a higher level of control, whereby the manufacturer can monitor any attempt to tinker with the car. Yet, at the same time, software developments and the growth of apps usage opens up a new field for tinkering, while carry-over systems from internal combustion engine cars, such as wheels exterior finish and interior fittings, still offer scope for modification.

Spyker (2007, 13) argues that not only cars, but many of our products have become too complex and he points out this is "…a big factor in our current difficulties in relating to emerging technologies." Among these emerging technologies we could count many of the technologies used by car manufacturers—or at least used as an excuse by manufacturers—to exclude us from true hands-on ownership of our cars. We "create technology, technology affects us, and we in turn create or, rather, refine, technology" (Spyker 2007, 67), but leaving this to a technological elite, divorces us from that important and inherently human bond with those technologies. Spyker explains that it can in fact be "spiritually comforting" to be pleased by an object (ibid., 84). He argues we should "love" our technologies although admitting we cannot quite love our machines like persons, but nonetheless we often treat our machines like persons, something Spyker argues is a good thing. It is also something that will become increasingly pertinent with the advent of more integrated IT systems, smart devices, robotics and the "internet of things." It is significant in this context that the US authorities have ruled that the smart systems driving an autonomous car are to be regarded as having the same status as a human driver (Shepardson and Lienert 2016).

Our ability to relate to our machines also involves an understanding of them and of how they are different from people. At the same time, love, tolerance, understanding and good will are equally good principles for how we get along with our machines as they are for how we get along with people. When it comes to fixing a problem with a machine, we need to learn to understand what it is saying to us; we need to listen to it, argues Spyker (2007). Spyker too places great importance on our ability to engage with technology in order to maintain it and fix it. He further argues that cars lend themselves better to anthropomorphizing than most machines and adds that as technology becomes an increasingly important presence in our lives, we need to learn to get along with it. He predicts that over time it is likely to become increasingly important to our spiritual well-being to be able to get along with our technology and to learn how to love it (Spyker 2007, 99). Vogel (2015) on the other hand challenges such anthropomorphizing, arguing that objects and our environment in the broadest sense are deserving of respect in their own right. It is interesting in this context how many Tesla owners truly "love" their cars. Although their ability to modify the car directly is limited, its regular software updates and upgrades make the car grow and develop in the way living things might, possibly providing the basis for a longer-term relationship built on continuous change and development.

Love your car?

Assuming that premature scrapping is wasteful, or indeed even morally questionable, as Kohak (1985) argued, is it possible to make consumers more attached to their cars, keep them significantly longer and thereby reduce the waste burden? The longer a product lasts, the less often it needs to be replaced and therefore the less often it needs to be produced, thus reducing overall production and resource use. At the same time, durable products significantly change patterns of consumption (Nieuwenhuis, 1994). Although older cars pollute more than newer cars—thus generating an apparently greater environmental impact—this can be largely rectified by retrofitting of equipment. With increasing electrification of the car, this problem will be gradually eliminated, yet the need for durability will grow (Ricardo/Carbon Trust 2011; Hawkins et al. 2012). The mass car industry has long resisted the move towards more durable products (de Groot and McCrossan Maire, 1998), although many specialist manufacturers, such as Volvo, Mercedes-Benz and Rolls-Royce, have prided themselves on their products" long life expectancy. That mainstream cars now last longer and are capable of much higher mileages has been due to the pressure to improve product quality in the wake of the greater reliability introduced by Japanese cars. In addition, Porsche (1976), Stahel and Reday-Mulvey (1981), and Deutsch (1994) have made it clear that cars can be made to last 20-30 years without significant additional cost. The Porsche work by its research arm in Weissach prompted its car division to specify the galvanization of bodies for its cars. Some Porsche models were made by Audi at this time, which then introduced this process on its own cars from the 1986 Audi 80 onwards. Audi also took another idea from the Porsche (1976) study on board, namely the use of aluminum bodies. This led to the Audi A8 with its aluminum spaceframe technology, developed in conjunction with Alcoa. Other firms already had a durability ethos, making long-life cars (LLC) that linked up with their quality image.

Yet, products are often discarded not because of a lack of technical durability, but because the consumer has lost his or her emotional attachment to it (Chapman 2005; Muis 2006). At the same time, products built for an expected lifespan of only 10-12 years, such as many cars from the 1960s, can be made to last many decades, if an owner can be found who is willing to build an emotional relationship with the product. By exploring this type of relationship, it may be possible to discover just how this could be used to build a model for sustainable consumption. The historic vehicle movement creates new local support structures far removed from the mainstream mass production car industry and its unsustainable consumption patterns. Ironically, it helps build the brand values many car firms crave, but often fail to support themselves in their short-term efforts to sell new cars (Dralle 2007; Nieuwenhuis 2008); it also encourages tinkering by owners.

The question remains to what extent these elements can be transferred to mainstream, modern mass-produced cars or their successors, particularly EVs and plug-in hybrids in the future. Nieuwenhuis (2008) suggests that a more modular approach to car construction would allow a higher degree of personalization and regular cosmetic changes. This would allow the car to co-evolve with the user, including updating to the latest fashion as well as new environmental and safety standards. Such modules could be marketed in their own right as well as or instead of new cars. Easy exchange of modules by the owner would also address the tinkering issue, while the greater reliability of EVs could render actual repair less frequent. EVs already have such a module in the form of their battery pack, which can be upgraded over time. Whether the cultural and emotional feature of classic cars could be addressed is less clear. On the other hand, with modularity there may be modules or options that are possible but somehow out of reach to many through limited editions deliberately designed to make such modules collectable and the cars more personalizable. By thus shifting obsolescence to smaller, lower impact modules—which themselves could be passed on to new owners—the greater impact of premature scrapping of the whole vehicle can be avoided, whilst retaining the fashion element of the car. The Smart Fortwo was conceived with some of these ideas in mind. Its colored thermoplastic body panels can be exchanged relatively easily with panels of different color or pattern, although in practice, few owners use this option.

If car replacement became more costly or discouraged in some other way, such systems might well work much better. From this point of view, the fact that EVs and plug-in hybrids are currently more expensive than conventional IC-engined cars may be a step in the right direction. Much is made of this higher cost, but we must remember that buyers do get state-of-the-art technology as well as more durable vehicles with lower day-to-day running costs in return for this price premium. Elon Musk seems to understand this well, arguing that his Teslas should be seen more as a design and technology-led Apple-style product, rather than the "ordinary" PC of the mainstream IC engine car. Also, if the Smart were to be offered as part of a product-service system (PSS) whereby the consumer would buy the use of the car on a lease-style basis, rather than the car itself, and the change in color was taken care of by the service provider at nominal cost, the take-up may well be much greater. In any case, Smart—which is one of the lowest environmental impact car brands available today—has already achieved cult status and their residual values were strong from the start (Jackson 2007).

I will argue, then, the classic car phenomenon as both an example of building the essential product-user relationship and as an example of an automotive product-service system, is a promising area for further scrutiny in the SCP context. It provides some hints at how the automobility system could become more sustainable both from the production and from the consumption viewpoint and also shows the role consumers and designers might play in such a transition.

Discussion and conclusions

One of the side effects of the Cartesian-Newtonian revolution that gradually rolled out across the western world and beyond from the 17th century onwards—and which gave us the scientific method; and many other benefits—is that we have adopted a mechanistic, often linear way of thinking. What we have lost is an appreciation of the interconnectedness of things. In societies we generally regard as less scientific and less rational, each effect has a cause; everything happens for a reason. This way everything becomes in some way connected with everything else. This is something we have lost and with it we have adopted a view of the world in which only those things we know to be connected become connected in our minds. Unfortunately, we have our limitations and assume that where we do not know there to be a connection there is not one. We lose a lot of information and intelligence by this approach, for in reality in our world many things are in some way connected with many other things. These "systems" and the significance of them and their interconnections is something we are only just beginning to unravel, taking us back in many respects to our "less sophisticated" or less rational ancestors. Morton (2010) refers to our ongoing relationship with various "others" or "strange strangers" as he terms them. These include objects around us, but in many respects also fellow humans, who we can never truly understand. However, much of his focus is on the other entities around us, animals, plants, so-called "inanimate" objects, etc. He initially adopts the term "animism" to denote this interconnectedness with the rest of what we encounter on this planet, granting them a status often equal to our own.

Cars, and technology generally, are normally seen as different, even alien from nature, as explored earlier. In this view, anything made by humans is fundamentally different from anything "natural." This artificial distinction may be unhelpful, especially in our move towards sustainable production and consumption. As we have seen, a number of authors, such as Spyker (2007) and Bogost (2012), as well as Kohak (1985) and Vogel (2015), also call for a re-evaluation of our relationship with "things," but perhaps we need to take this further. In any case, the conventional perception of objects as inherently different from living things, "animate" versus "inanimate," which may be obvious to many in the West (e.g., Taylor 1986), is not a universally held view and we must allow for the possibility of different perspectives. A different way of analyzing our impact on our environment, as mentioned earlier, may be helpful in opening the debate. We as humans are part of nature; is it not therefore a reasonable assumption that what we create is also part of nature in the way that bird's nests and beaver dams are natural phenomena? Or, are our creations—Vogel (2015) gives the example of a shopping mall—fundamentally different, and if so how, and why? There is no clear answer to this. The only real argument we could advance here is that the scale of our impact is greater, but its inherent nature is not; we do after all only make things from what we find on our planet in the same way that termites, ants, beavers and birds do for their structures.

Contrary to what may be an environmentalist's immediate reaction, this is not such an heretical notion. In fact, the notion that our impact is fundamentally different suggests that we are not part of nature, and this takes us back to an increasingly outdated worldview, whereby we are separate from—and indeed superior to—the remainder of creation. This is a notion we are in the process of abandoning and by doing so, we are joining many other cultures whose more integrated view of our role in the natural environment is often presented as more sustainable. So, we have a stark conceptual choice: are we part of nature, but our creations are not, or are we not part of nature and therefore neither are our creations?

In reality, the renewed realization that we are, after all, an integral part of the natural environment is—in the West at least—relatively recent and may ultimately be linked with thinkers such as Darwin or Wallace and a "natural" outcome of the Cartesian-Newtonian model. It is not surprising, therefore, that we have not yet made the adjustment of also regarding our creations as natural. The problem is that we have developed the notion that nature is somehow totally benign and therefore anything that is not is not natural. Yet nature can be far from benign, sowing death and destruction. Toxic gases and other destructive forces unleashed by volcanoes, poisonous plants and pathogens have killed people and animals alike, likewise venomous members of the animal kingdom, man-eating crocodiles, etc. From a human perspective, nature definitely has two sides, good and bad, and much of human activity over the past few tens of thousands of years has involved protecting us from the more negative aspects of the rest of nature, through protective shelter, protective weapons, greater control over our food sources, protective SUVs to travel in, etc. Similarly, our creations are not really very much out of step with this mix of positive and negative aspects; cars are great in many respects but have also brought with them a new set of problems, including pollution and a new wave of accidental death; this duality is not unnatural and does not make our creations unnatural.

Lipton and Bhaerman (2011, 33) remind us that cognitive neuroscience now holds that the self-conscious mind represents only about 5% of our cognitive activity. This means that the other 95% of all our decisions, emotions, behaviors, actions are the product of the hidden subconscious part of our mind, making it perhaps our closest "strange stranger" as Morton (2010) would put it. Rational environmentalism on the whole tries to appeal to that 5%. Not surprisingly, most of its efforts to convince us through rational argument towards more sustainable behaviors are ignored. Most of our awareness is formed in our early years using this dominant 95% and when we finally do apply the 5% of the self-conscious rational mind, it would seem that we are largely unaware of what the other 95% is up to—most of our motivations are therefore effectively invisible to our own conscious mind. For this reason, otherwise perfectly rational and well educated (though rarely in climate science) people may feel able to challenge the much greater specialist expertise of climate scientists in ways that they would not accept being challenged within their own disciplines or areas of expertise. As Lipton and Bhaerman (2011, 39) point out, this does not only impact on the individual, but it can "…alter an entire civilization." Diamond (2005) explains how this often has disastrous consequences for such civilizations.

Despite concerted efforts to limit the impact of individual cars, as outlined in the first section, the environmental, economic and social impact of our car system has not been significantly reduced by these efforts. Similarly, the drive towards automated cars is unlikely, under most scenarios, to ease these problems, while taking away the driving function from people may further alienate people from products, thereby reducing the perceived value of cars even further and making them even more disposable in the eyes of the user. Alternatively, shared use could, theoretically, lead to more intensive use of such automotive resources, which could lead to an overall reduction in numbers of vehicles and which could therefore be environmentally beneficial, although this too is not a given (Sperling 2018). The problem of unsustainable automobility lies elsewhere; it lies in those softer notions of culture, psychology and our understanding of where and how we fit into the earth system. Appealing to our reason in trying to bring about change is therefore of limited use; we need to find ways of appealing to those much deeper aspects of peoples' motivation in order to progress to that more sustainable and more resilient way of doing things. A greater appreciation of and emotional relationship with our objects—such as our cars—will not bring about that critical shift from an economic to an ecological worldview, but it may be a first step in that direction.

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CHAPTER FIVE

CARS, CULTURE, CARBON, AND CLIMATE: AN EXAMINATION OF THE MORE AND LESS VISIBLE ATTRIBUTES OF THE AUTOMOBILE

JEAN LÉON BOUCHER

Abstract

In light of the crisis of climate change and the established relationship between household income, energy use, and greenhouse gas emissions, I study how sociocultural and economic forces converge upon the more visible—publicly observable—versus less visible attributes of a popular consumer item: the automobile. Using a 2008, U.S., nationally representative survey (n=2,091) inclusive of respondent demographics, climate change belief, neighborhood effects and motor vehicle data, I test for associations with automotive behavior: vehicle emission rate (more visible attribute), number of vehicles owned and miles driven per year (lesser visible attributes). I find a strong significantly positive association between household income and these attributes, but only a moderate interaction effect from household income and climate change belief for one characteristic: vehicle emission rate. Additionally, in contrast to miles driven, there is a much stronger association and greater neighborhood/site effect for vehicle emission rate and number of cars owned. These findings suggest that vehicle emission rate, a more visible/conspicuous signal, is more susceptible to the constraining and enabling power of social norms than the more invisible/inconspicuous (non-)signal of vehicle usage itself. Furthermore, household income is generally most strongly associated with these vehicle attributes, effectively conferring on its bearer a greater power to pollute. Considering the present challenge of reducing greenhouse gas emissions and the impacts of climate change, I urge scholars of the social sciences to redouble their efforts in understanding and utilizing the "power of the social" and its influence in everyday consumer life.

Introduction[1]

In this study, I examine how the automobile may be an artifact at the nexus of varied social forces, and how it might reveal the ways these forces relate or are in tension with each other.[2] For example, how might personal income be at odds with one's environmental attitudes, consumption lifestyle, or other sociocultural factors? Consequently, one of the broader intentions of this research is to use the automobile, a near ubiquitous sociogeographic item, as a conduit for extending interdisciplinary scholarship—economic, sociological, environmental—while also exploring avenues to shift human behavior toward greater sustainability.

As the crisis of climate change receives greater attention and calls for action grow stronger, I examine how three different attributes of the automobile may be influenced by economic, environmental, and sociocultural forces. Since the automobile is known to be a major contributor to human generated greenhouse gas emission (Padgett et al. 2008)—Jones and Kammen (2011) claim that it constitutes 20-40% of a U.S. household's emissions, I am curious to know what this highly used but environmentally suspect "good" might have to reveal with respect to socioeconomic and cultural norms. Additionally, might the motor vehicle play something of a marker or signal of the human response to global climate change?

In the following sections, I (1) review the pertinent literature, (2) explain the data and methods, (3) report findings, and (4) discuss these findings and conclude. I will argue that there are important ways by which sociocultural forces associate with the more visible attributes of an automobile, though household income has the capacity to trump these associations. For analysts who want to shift motor vehicle consumers toward more sustainable lifestyles, creative uses of visibility may be explored, but it is also necessary to confront the income-carbon relationship: the near intractable relation between higher incomes and more energy intensive behaviors.

Review of the literature

Due to global climate change and other environmental impacts attributed to human activities (IPCC 2014; Melillo, Richmond, and Yohe 2014; Rockström et al. 2009; Zalasiewicz et al. 2015), a wave of scholarship is revisiting human-environmental attitudes and behaviors, especially those associated with energy-use and carbon emissions (Brulle 2010; Dietz et al.

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[1] I would like to thank Paul Nieuwenhuis, Jukka Heinonen, and Maria Juschten for early critiques and suggestions on this chapter.

[2] I use terms like *automobile*, *car*, and *motor vehicle* synonymously.

2009; Maibach, Roser-Renouf, and Leiserowitz 2008; McCright 2009; McKenzie-Mohr 2011).[3] Related to this devlopment, other scholars have identified—in a number of industrialized nations—a positive relationship between income and carbon emissions (Dey 2010; Druckman and Jackson 2009; Jones and Kammen 2014; Ummel 2014); and this relationship is strong enough to override/annul personal attitudes on the environment (Boucher 2016a; Csutora 2012; Gatersleben, Steg, and Vlek 2002; Wilson, Tyedmers, and Spinney 2013). Additionally, researchers in the United States assert that there is a geospatial patterning of GHGEs (greenhouse gas emissions) which is related to population density (i.e., urban, suburban, rural) (Jones and Kammen 2014; Ummel 2014).[4] In short, as income is socio-spatially stratified (Schill and Wachter 1995; White 1987), so are carbon emissions (Boucher 2016; Chancel 2014; Jones and Kammen 2014; Ummel 2014). In one U.S. study, Ummel (2014, 12) found that "the top 20% of polluters accounted for 40% of all GHG pollution," while for Boucher (2016a, 64)—with respect to "mobility-dietary carbon," the top 20% emitted 52.2% of all emissions (equating to more than the other 80% of the population) while the bottom 40% only emitted 13.3%. On a conceptual level, what can be seen in these emissions inequalities is Freudenburg's (2005, 2006) notions of *disproportionality* and *privileged access*—a small group of people having disparate access to environmental resources and waste sinks.

The motor vehicle

The automobile, among numerous other sources, is often seen as a key contributor to human generated GHGEs (Jones and Kammen 2011; Lynas 2007; Padgett et al. 2008). This is due to—besides the energy used in its production—the fossil-fuel-burning character of the internal combustion engine (ICE), whose emissions have long been considered toxic, to both humans and the broader environment (Ott and Roberts 1998; Wallace 1995). This toxicity has the capacity to affect human health directly (i.e., with inhalation) and indirectly by aggregate CO_2 impacts on the atmosphere

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[3] Though in strict measures they are not the same thing, in this chapter, I use the terms carbon emissions, GHGs, carbon, carbon footprint, CO_2 and CO_2e synonymously. They refer to the emitted greenhouse gases and carbon dioxide (CO_2) equivalents emitted during any part of the human extraction, processing, production, distribution, consumption, and/or dumping of a product/good.

[4] Similar findings have been reported in China (Zhang, Luo, and Skitmore 2015), Ireland (Lyons, Pentecost, and Tol 2012), and the UK (Fahmy, Thumim, and White 2011).

(e.g., global climate change). Even automobile noise pollution has effects on human health (Li, Qiao, and Yu 2016; Stansfeld and Matheson 2003). It might pose something of a puzzle, then, that ICE powered vehicles are globally ubiquitous; however, there have been improvements in vehicle efficiencies and emissions and, more recently, the development of alternative fuels, hybrids, and electric vehicles (Høyer 2008; IEA 2016; IRENA 2017). Note, though, that hybrids and battery electric vehicles have their own lifecycle toxicity issues (Brennan and Barder 2016; Hawkins et al. 2013) in what some called "problem shifting" (Majeau-Bettez, Hawkins, and Strømman 2011, 4553).

The automobile is more than a motorized means of transport (with emissions and toxicities), it is also a cultural artifact; and cultural analyses of the motor vehicle, Miller (2001b) argues, can be likened to an analysis of culture itself. Like other goods and possessions, scholars report that automobiles can be imbued with meanings reflective of one's culture and broader social relations, i.e., family, friends, and fashion (Csikszentmihalyi and Rochberg-Halton 1981; Douglas and Isherwood 1979; McCracken 1986; Willis 1978) and/or demographic categories like social class (Garvey 2001; O'Dell 2001), race (Gilroy 2001; Stotz 2001), gender (Garvey 2001; Stotz 2001), and age (Garvey 2001; O'Dell 2001). These findings in *material culture* (Miller 2001b) are comparable to those from studies in consumer tastes and preferences and the way tastes/preferences can function as markers of group distinctions (Bourdieu 1984).[5] Likewise, these group meanings can psychologically approximate that of a personal relationship: where self and group identifications embodied in a good can provide emotional comfort and a sense of belonging (Fournier 1998; Pugh 2009; Willis 1978). In other words, someone's car can become something of a tribal marker: signaling group membership, while simultaneously grounding the significance of the self. Therefore, besides instrumental purposes, scholars find that there are also hedonic, emotional, and symbolic motives for car ownership and use (Dittmar 1992; Graham-Rowe et al. 2012; Steg 2005a).

The research in material culture, then, suggests that the meanings embedded in goods and products—i.e., a motor vehicle—may be more significant to an understanding of the social world than any utilitarian meanings in the good itself (Douglas and Isherwood 1979; Fine and Leopold 1993). From this perspective, considering its ubiquitous use in the repertoire of human daily life and lifestyle, the motor vehicle may have secured—in many cultures—an essential role in what it means to be human itself (Miller 2001b).[6] Additionally, this evidence of embedded meanings in the micro-level automobile can also be seen as an effect of macro-level forces: the workings of power—powerful actors and institutions, markets, and the state (Bourdieu 1984; Garvey 2001; Gilroy 2001; Miller 2001).[7] In other words, automobile analyses may give insight into both the workings of and an individual's positionality—i.e., status—in macroscale structures of political and socioeconomic power. However, scholars also argue that universal meanings cannot be attributed to the motor vehicle: meanings and/or markings are often localized and specific to particular regions and social group categories (Garvey 2001; O'Dell 2001)—or what Miller (2001b) calls *car cultures*.[8]

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[5] Some scholars have used car ownership as a proxy for the middle-class in "developing" countries (Dadush and Ali 2012).

Car culture, lifestyle lock-in, and the income-carbon relationship

Due to settlement arrangements (i.e., urban, rural, suburban) and perhaps justifying the utilitarian motives for vehicle ownership, scholars argue that cars and built environments are caught in a cause-effect loop (Newman and Kenworthy 2000; Vilhelmson 2007). The claim is that cars are a constitutive component of urban sprawl and, consequently, due to sprawl and resultant distances from urban goods, services, and jobs, the automobile has become a necessity of daily life. This vehicle/built-environment dependency also contributes to a kneejerk reliance—a car habit—that is very difficult to alter (Bamberg and Schmidt 2003a; Fujii and Gärling 2007; Hunecke et al. 2008; Verplanken 2011). Furthermore, a long socialization may contribute to vehicle habituation: the self-evident, taken-for-granted-ness of automotive travel. Signs of early automotive socialization can be seen, for example, in the way family life may revolve around vehicle travel and how parents positively frame and gift their children with toy cars for play (Stokes and Hallett 1992).

The automobile habit can also be understood as an element in *lifestyle lock-in*: the way daily consumer behavior is culturally and socio-economically constrained. Lifestyle lock-in is a concept used by some scholars to help explain the stratification of GHGEs (Boucher 2016a;

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[6] Miller (2001b) observes the geographic dominance of car infrastructure on the planet and suggests a reversal in the analytic gaze from humans and their cars to cars and their humans.

[7] For an historical analysis of the power struggles and the political factions involved in the automobile's quest to dominate roadways in the United States see Norton (2008) *Fighting Traffic: The Dawn of the Motor Age in the American City*.

[8] Similarly, then, it is not difficult to imagine "non-car" cultures, or the way a walking, biking, or public transport culture may manifest itself.

Chancel 2014; Druckman and Jackson 2009; Weber and Matthews 2008); the concept is a corollary to the *income-carbon relationship*: the way people generally consume to their income (Boucher 2016a; Gatersleben, Steg, and Vlek 2002; Sanne 2002) regardless of their environmental or ecological attitudes (Boucher 2016a; Csutora 2012; Gatersleben, Steg, and Vlek 2002; Wilson, Tyedmers, and Spinney 2013).[9]

What can be inferred from these diverse findings in cross-disciplinary, psychosocial and material phenomena are the conceptual elements of what some term the "accoutrement of class" (Boucher 2016b; Arblaster 2017; Karl 2009). One's income/class positioning is not only a set of habits or a habitus—a system of engrained predispositions (Bourdieu 1984), but also a collection of material goods entwined with one's social identity.[10] In other words, these accoutrement are the trappings and "equipment" by which individuals both concretize and recognize their own psychosocial persona (Dittmar 1992; Shweder 1990) while simultaneously signaling to others (and themselves) their "place" in the social world (Goffman 1951; Bourdieu 1984). The "social world" being a vast conceptual place: a hierarchical, psycho-socioeconomic field of people and groups, things, power, symbols, and status, and also—under present dominant modes of energy production—disparate energy use and its consequent wastes.

Environmental attitudes, the automobile, and visibility

With respect to environmental attitudes and the automobile, there is evidence that attitudes influence travel choices and car usage. Most of this evidence derives from the European context: countries like Germany (Klöckner and Blöbaum 2010; Bamberg and Möser 2007; Bamberg and Schmidt 2003b; Bamberg 2013; Keller and Vance 2013), the Netherlands (Poortinga, Steg, and Vlek 2004; Steg 2005b; Verplanken et al. 1994), Sweden (Nordlund and Garvill 2003; Nilsson and Küller 2000), Scotland (Stradling 2007), and the UK (Anable 2005).[11] There are, though, a couple of pertinent studies conducted in the United States (Flamm 2009; Kitamura, Mokhtarian, and Laidet 1997). All these investigations primarily focus on travel mode choice—walking, biking, public or personal transport---or reducing car usage, but they do not "drill down" into the automobile as a cultural artifact.[12]

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[9] Gatersleben et al. (2002, 354) argue that "as soon as people have the financial ability to perform the behavior, they are tempted to do so" and Sanne (2002, 280) identifies a "ratchet effect": the more money people have, the more they buy, and the more they buy, the more money they need to support themselves.

[10] Though not mutually exclusive, income and class are not synonymous; I conceive of class as having more cultural qualities and income more monetary.

[11] Some of these studies only focus on university students (e.g., Bamberg and colleagues).

Additionally, they all find that environmental knowledge and attitudes are associated with a reduced energy intensity in travel modes and car usage, but most do not consider associations with income. From those that do, lower income is associated with a more constrained travel behavior while higher income with a more energy intensive behavior (Flamm 2009; Anable 2005; Kitamura, Mokhtarian, and Laidet 1997; Poortinga, Steg, and Vlek 2004). Specifically, in metropolitan Sacramento, California, Flamm (2009) found a clustering of associations related to income: higher incomes related to more vehicles owned and miles driven, but lower fuel efficiencies. Perhaps the primary challenge emanating from Flamm's (2009) study is that pro-environmental attitudes and income appear to be working at cross purposes: in relation to travel behavior, reductions were associated with stronger pro-environmental attitudes and increases associated with higher incomes. Additionally, Poortinga, Steg, and Vlek (2004) found that income, level of education, and household size are positively related with transport use.[13]

These findings in driving/travel behavior relate to other economic and social-psychological literatures: for one, stigma and its avoidance (Goffman 1963; E. E. Jones, Scott, and Markus 1984). Similar to Bourdieu (1984), Goffman (1951) argues that people generally have a "sense of their place" in society and signal as much by the deployment of appropriate status symbols. In this way, one presents an image and manages the impressions of others (Goffman 1959). Implied in this management behavior is the premise that most people care what others think: "people are watching" and appearances matter. Individuals, in turn, generally seek approval and acceptance from their peers; they seek belonging (Pugh 2009), to "fit in." Notions of conspicuous consumption may be argued (Veblen [1899]2005), a type of "keeping up with the Joneses" in order to not feel ostracized or stigmatized.

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[12] There is also a growing number of studies that analyze the factors related to electric vehicle adoption. For a small sample see Bockarjova and Steg (2014) and Higgins, Mohamed, and Ferguson (2017).

[13] There are other insights to be gleaned from these studies: travel behavior can be motivated by different reasons, while different behaviors can be motivated by the same reason (Anable 2005); geography and context matter: in land use patterns and the availability of public transport (Kitamura, Mokhtarian, and Laidet 1997; Keller and Vance 2013); there is a relation between travel behavior and fuel prices (Keller and Vance 2013), personal norms and one's willingness to cooperate/change (Nordlund and Garvill 2003). In the realm of affect, there are different types of drivers ranging from those who love it to those who detest it (Steg 2005b; Anable 2005; Dudleston et al. 2005); women have been found to drive in more environmentally friendly ways than men (Nilsson and Küller 2000). Generally, there is something of a "standard fare" of constructs used in these psychosocial studies: beliefs, values, personal and social norms, awareness of consequences, ascription of responsibility (attribution processes), perceptions of behavioral control, prior behavior and habits.

Concepts from both *positional good* and *mimetic desire* theory can be identified here, primarily through mechanisms of interpersonal comparison which is engaged by observability/visibility. For Frank (1985), the primary principle which sorts positional from non-positional goods is observability (Frank 1985): without observability/visibility (i.e., conspicuousness), the comparable and positional capacities of a good diminish.[14] Positionality is one's location/status in socioeconomic hierarchy and the positional capacities of a good are relative: dependent on how the good compares to goods owned by others (Frank 1985). Frank (1998, 2007) also argues that competitive comparisons gone awry have set off a *positional arms race*—a type of infectious "one-upmanship"—resulting in cascading expenditures as more people try not to fall behind others. In turn, Frank (2008) argues for limits on positional goods through a regulatory intervention or a progressive consumption tax.[15]

With respect to mimetic desire/theory, advocates posit that people's desires are not so much their own as from someone else (Girard 1965). People and animals are known to imitate and mimic one another (Hurley and Chater 2005), and at different degrees of consciousness and even non-consciously (Donald 2005; Girard 1987; Garrels 2005). Both positional comparison and memetic desire appear to be operating in concepts like neighborhood effects, where, for instance, in an example from research in clean energy diffusion, one adoption of a solar photovoltaic system on one neighbor's roof creates a ripple effect---over time---of other solar systems on other neighbors roofs (Bollinger and Gillingham 2012).[16]

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[14] Though I might draw definitional differences between observable versus visible, for my purposes here, I will conflate them and define them as the capacity to be seen by others.

[15] His ideas have been criticized (Kashdan and Klein 2006) and he has responded (Frank 2006).

[16] Though the term *visibility* seems the most accessible, considering the near synonymous character of these concepts, I could have entitled this chapter, "the more and less *observable* attributes of the automobile" or "comparable attributes" or "positional attributes."

Returning to the idea of stigma—a discredited/disqualified social status and one's inability to "pass" due to the display of "wrong" signals, Goffman (1963) asserts that certain personal attributes or "marks" are more easily concealed than others. For instance, physical marks like skin color or sex are more visible and therefore more difficult to conceal whereas social class or some minor physical deformity can be more easily disguised. Therefore, due to their character, some attributes can more quickly *discredit* a person while others may only create a *discreditable* person: a state of possibility—potential stigma—when attributes are less visible (Goffman 1963; E. E. Jones, Scott, and Markus 1984). Similar dynamics may be seen in an automobile and I frame these ideas within my usage of the term *visibility*: publicly observable. I argue that there are attributes of a car that are more visible—like its size, inferred emission rate, and age—and other attributes that are less visible—like the frequency and distance it is driven.

A proposal and hypotheses

Considering this varied yet related scholarship, I propose to study the automobile as an artifact at the nexus of grander phenomena: cultural, economic, social, environmental. My goal is to explore how the automobile, as a possible extension of economic and cultural systems, has something to reveal about human-environmental behavior, lifestyle lock-in, and sociocultural influences. Specifically, my research question is: In what ways might the automobile—in its more visible and less visible attributes—be a marker of social, cultural, economic, or environmental phenomena. My intent is to expand on an earlier study I conducted (Boucher 2016a) by parsing the automobile into these more and less visible attributes (detailed below) while testing these attributes against demographic, neighborhood, economic, and attitudinal factors. In accord with the literature, I propose two hypotheses based on three propositions to operationalize the concept of visibility. First, I hypothesize that:

1. the more visible attributes of the automobile will be more associated with socio-cultural and economic influences than the less visible attributes of the automobile.
2. the less visible attributes of the automobile will be more associated with economic influences than socio-cultural influences.

Note, in these hypotheses, when I use the term *sociocultural*, I am referring to collective forces like group qualities and behaviors; operationally, these include phenomena like education, political ideology, and environmental attitudes. Additionally, income itself can be thought of as more than money; it can be interpreted as a proxy for something else, like "a set of normative, socially positioned behaviors—an income lifestyle, a class culture" (Boucher 2016a, 69).

With respect to operationalizing vehicle visibility. I consider the most visible attribute of an automobile to be its physical body size. I also consider that most related to its size is its mass, and consequent fuel efficiency and emission rate (as in physics and mechanics, mass is an essential property in calculating kinetic energy and the force required to move an object).[17] However, car owners may be more conscious of their car's size and fuel efficiency than its mass (though these are related).[18] Additionally, I am interested in conceptualizing different vehicle types as a self-evident—taken for granted—social signal/positional good: people drive vehicles that they perceive (consciously or not) are socially accorded their social standing—and the same might be said of the number of cars someone owns. In turn, I use emission rates and other vehicle attributes to operationalize visibility and the unspoken social expectations in vehicle ownership. I consider, then, these more visible attributes as an extension of impression management (Goffman 1959).

To operationalize visibility, I propose that:

a. emission rate is the most visible attribute of the vehicle.
b. the number of cars someone owns is less visible (an individual cannot simultaneously drive two or three cars in public view).
c. yearly vehicle mileage is the least visible attribute as it is harder for others, a colleague or a neighbor, to know how far someone might regularly drive.

Data and method

Though I use nearly the same data and methods of an earlier study (Boucher 2016a), in this present study, I focus strictly on the automobile and its reformulation into more visible and less visible attributes: vehicle emission rates, number of cars owned, and miles driven per year. I use these vehicle attributes as dependent variables against a collection of demographic variables and proxies for "neighborhood effects."[19]

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[17] Note: I us the concepts *emission rate* and *fuel efficiency* as opposites, the inverse of each other.

[18] Though cars can have different engines, drivetrains, aerodynamics, and age performance, I assume that these differences are not so great as to overcome the general effects of mass/size.

Similar to the earlier study, I rely on several datasets to accomplish this. My primary data source is the 2008 iteration of the Climate Change in the American Mind survey (CCAMS; N=2,091).[20] This is a weighted, nationally representative dataset from the United States.[21] It includes different respondent demographic data, political ideology, beliefs about climate change, automobile ownership, primary vehicle make and model, miles driven per year, and average number of passengers per trip.[22] To enhance this data, I matched primary vehicle make and model with standard emission rates (grams of CO_2 emitted per mile driven; gCO_2/m) as supplied by the US Environmental Protection Agency (EPA 2015).[23]

Additionally, as the CCAMS data contains census tract locations of respondents, I merged this data to the American Community Survey (ACS 2015). From this merged dataset, I was able to proxy site/neighborhood effects through census tract median income, presence of college degreed households, median home value, and population density.[24] I also incorporate a dichotomous metropolitan statistical area (MSA) measure—MSA/non-MSA; this variable was part of the CCAMS.

With respect to climate change beliefs, similar to my earlier study (Boucher 2016a), I do not utilize the whole spectrum of six segmented

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[19] Though I will not carry these throughout the text, in this instance, I have neighborhood effects in quotes as these effects are more precisely measured over time, a variable not available in this cross-sectional data.

[20] I use this data by permission. The *Climate Change in the American Mind survey* is part of an ongoing study and has been the source of many reports (Yale 2015). Among other things, this survey tracks and examines US public understanding of climate change. For more detail see Maibach et al. (2011, 7 8).

[21] Concerning the representativeness of the dataset, the CCAMS is weighted to be nationally representative using benchmarks from U.S. Census data.

[22] A shortcoming of this study, then, is this data only contains detailed information for a household's primary vehicle (none of the others) and, therefore, I only study the primary vehicle.

[23] There were a few variables with missing values; these variables ranged from an incomplete belief construct, to values missing for automobile ownership or make and model, to missing home values for census tracts. Each set of missing variables was address in a way that was most appropriate for its circumstance: some cases were deleted and for others, averages were imputed. When I received the 2008 CCAMS dataset, it contained n=2,165 cases. After resolving each set of missing values, a sample of n=2,091 remained. Thus, from the initial dataset, 3.42% of the cases were removed. Please contact me for further details.

[24] Since the CCAMS data was from 2008, I used the ACS 5-year estimate for the years 2006-2010.

"belief types" common to many CCAMS publications (Leiserowitz et al. 2012; Leiserowitz, Maibach, and Roser-Renouf 2009; Roser-Renouf et al. 2016).[25] Instead, I split the types into two main groups: the strongest believers—the Alarmed—versus the rest—the non-Alarmed.[26] In accord with my earlier research, this dichotomizing of the belief types is the variable form that delivered the most statistically significant results (Boucher 2016a).[27]

With respect to method of analysis, I use quantitative, multi-model linear regression and incorporate the above collection of variables as estimated socio-cultural proxies of possible group attitudes and/or collective forces. I test these forces against my three measures of vehicle visibility/invisibility: emissions rate, number of cars owned, and annual miles driven (mileage).

Findings

As derived from the respondent sample (n=2,091), descriptive statistics for all the variables used in this study can be seen in Table 4. In the lowest rows of this table are some of the variables of primary concern: vehicle ownership (fourth from the last row) shows that 92.1% of all sampled households own at least one vehicle (therefore, about 8% do not); on average, households own 1.92 vehicles and respondents claimed to drive their primary vehicle about 10,201 miles per year [16,417 km/yr]. Moreover, this primary vehicle emitted an average of 388.9 grams of carbon dioxide per mile (gCO$_2$/m) [241.7 gCO$_2$/km], a figure which seems quite high in comparison to a 2007 European fleet average of 158.7 gCO$_2$/km (European Commission 2016).[28] The average yearly household income of a respondent—an ordinal variable—was 11.13 ($40,000 to $49,999—the median

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[25] In regards to climate change belief, these six respondent segment-types are identified as: *Alarmed*, *Concerned*, *Cautious*, *Disengaged*, *Doubtful*, and *Dismissive* (Leiserowitz, Maibach, and Roser-Renouf 2009).

[26] Note: when I use the term *belief*, I am not invoking a religious concept. Specifically, *belief*, in this study, refers to an individual's affirmative response to the question: "Do you think that global warming [or climate change] is happening? Yes, No, or I don't know" (Leiserowitz, Maibach, and Roser-Renouf 2009).

[27] Thus, with respect to emissions calculations, the belief segments were not normally distributed.

[28] As this study was conducted in the United States, it has the shortcoming of U.S. standards of measure. I do not convert all figures from miles to kilometers, but I have converted these figures to give international readers a sense for the metric equivalents.

Table 4. Respondent descriptive statistics (n=2,091)

	Mean	Std. Deviation	Minimum	Maximum
Age	46.6	16.7	18	94
Sex/gender				
Male	48.1%	-	0	1
Female	51.9%	-	0	1
Education				
Highschool or less	44.6%	-	0	1
Some College	27.5%	-	0	1
Bachelor's Degree	18.8%	-	0	1
Master's or higher	9.1%	-	0	1
Race/ethnicity				
White	69.6%	-	0	1
Black	11.2%	-	0	1
Other (Non-Hispanic)	5.1%	-	0	1
Hispanic	13.0%	-	0	1
Two or more races	1.1%	-	0	1
Household				
Household Size	2.54	1.46	1	10
Passengers (typically)	1.84	1.15	1	10
Political ideology				
Very liberal	6.2%	-	0	1
Somewhat liberal	21.2%	-	0	1
Moderate	39.4%	-	0	1
Somewhat conservative	23.5%	-	0	1
Very conservative	9.0%	-	0	1
Refused	0.7%	-	0	1
Census tract (CT)				
CT Median income	$53,987	$24,598	0	$238,482
CT %BA degree or More	27.6%	18.0	0	91.8
CT Median home value	$236,505	$179,335	$13,300	$1,000,000
MSA Status	83.6%	-	0	1
CT Pop. density	4,635	11,242	0.4	133,518
Primary variables				
Household income	11.13	4.2	1	19
Alarmed by climate change	18.0%	-	0	1
Vehicle ownership	92.1%	-	0	1
Primary vehicle emissions	388.9	141.8	0	740.6
Vehicles in household	1.92	1.42	0	15
Mileage per year (est.)	10,201	12,112	0	100,000

Source: Climate Change in the American Mind Survey (2008); US Census Bureau, American Community Survey 5-year Estimate, 2006-2010 (US Census Bureau, 2015).

Note: (1) I do not report standard deviations for dummy variables as they are not meaningful and (2) the Census data for census tract median home values maximizes at $1,000,000 when values are likely higher. However, the $1,000,000 cases account for only 1.0% of the sample.

was 12 at $50,000 to $59,999/yr.[29] Approximately 18% of all respondents were in the Alarmed category of climate change belief. Note that the standard deviation (12,112) for yearly mileage is greater than the mean itself (10,201), an illustration of the great variance in miles driven per year by different respondents.

Linear Regression. Three regression analyses were conducted: one for the dependent variable of vehicle emission rate (the more visible vehicle attribute), another for the number of vehicles owned (less visible), and one for vehicle yearly mileage (the least visible attribute). These were multi-model analyses where different categories of independent variables were successively introduced to examine variable relations.[30] However, I mostly review the findings from the last two models/columns of each table as this is where the highest explanatory capacity resides.

Table 5 illustrates the findings of the regression analysis for primary vehicle emission rate (gCO_2/mile). Successive variable sets (models) are introduced: (1) a base demographic; (2) neighborhood effects; (3) household income; (4) climate change beliefs; (5) number of cars and annual primary vehicle mileage; and (6) vehicle ownership itself. As vehicle ownership, in model 6, is such a dominant variable, I mostly review model 5. Note that I define a significant relationship below 0.100 as weak and above 0.100 as moderate to strong, and I am mostly interested in these moderate to strong relationships.

In model 5, there are significant positive correlations (in declining order of strength) between vehicle emission rate and household income, number of cars owned, number of passengers, mileage/year and respondent age;

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[29] There are nineteen categories for the CCAMS household income variable: (1) Less than $5,000; (2) $5,000 to $7,499; (3) $7,500 to $9,999; (4) $10,000 to $12,499; (5) $12,500 to $14,999; (6) $15,000 to $19,999; (7) $20,000 to $24,999; (8) $25,000 to $29,999; (9) $30,000 to $34,999; (10) $35,000 to $39,999; (11) $40,000 to $49,999; (12) $50,000 to $59,999; (13) $60,000 to $74,999; (14) $75,000 to $84,999; (15) $85,000 to $99,999; (16) $100,000 to $124,999; (17) $125,000 to $149,999; (18) $150,000 to $174,999; (19) $175,000 or more.

[30] One of the reasons for progressively entering variables into an analysis is to investigate dynamics of misrecognition (Bourdieu 1990). For example, in Table 5, models 1 and 2, the category *female* has a significant negative association with emission rate, suggesting that women drive more efficient vehicles than men. However, when household income is introduced in model 3, female is no longer significant, suggesting that in model 1 and 2 female was something of a proxy for income. To argue for an association with female, then, would be a case of misrecognition—as the true association is income. Though a positive correlation, the same dynamic can be seen with the political ideology category, *very conservative*, in the same table and in the same models 1 and 2.

there are significant negative correlations between vehicle emission rate and census tract population density and the climate change belief Alarmed * Income interaction. There is also a significant but *weak* positive correlation for those who responded as very liberal, and *weak* negative correlations with census tract median home values, higher education, the Other (non-Hispanic) race category, MSA status and those who refused to respond to the political ideology question. The adjusted R^2 is strong at .316 (model 5), it then increases to .670 in model 6. The F values are significant for model 5 at 38.127 and model 6 at 158.180.

Table 6 depicts the findings of the regression analysis for the number of vehicles owned by a household. Again, successive models are introduced: (1) a base demographic; (2) neighborhood effects; (3) household income; (4) climate change beliefs; and (5) both primary vehicle emission rate and mileage.[31] I mostly review model 4 and discuss some differences from the impact of model 5. In model 4 there are significant positive correlations (over .100 and in declining strength) between number of vehicles owned and household income and household size. There are no significant negative correlations above .100.

There are also significant but weak positive correlations for those who responded as somewhat conservative, the number of passengers, census tract median income, and very conservative; and weak negative correlations with the category female, census tract median home value, census tract %BA degree-more, MSA status and Master's or higher. The adjusted R^2 for model 4 is moderate at .180 and the F value is significant at 20.155.

In model 5, with the addition of controls for vehicle emission rate and mileage, there are some weak changes in the significance of some of the independent variables, e.g., age, Master's or higher, number of passengers and somewhat liberal, but a much stronger shift in the power of household income—apparently due to the strength of the emission rate to number of vehicles relationship. In other words, in model 5, there is a higher association between the primary vehicle emission rate with respect to how many vehicles are owned than to the household's income. In a more pronounced way, this table illustrates the positive significant relationship between the three dependent vehicles of this study: vehicle emission rate, number of vehicles owned, and annual mileage driven. For model 5, the adjusted R^2 is strong at .233 and the F value is a significant at 25.467.

Table 7 illustrates the findings of the regression analysis for primary vehicle annual mileage (miles/year). Again, successive models are introduced: (1) a base demographic; (2) neighborhood effects; (3) household income;

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[31] I do not include vehicle ownership in this analysis as it is embedded in the dependent variable for this table, number of vehicles owned.

(4) climate change beliefs; (5) primary vehicle emission rate and mileage; and (6) vehicle ownership. I mostly review model 6 as vehicle ownership does not have the dominating association it had in Table 5. In model 6 there are significant positive correlations (>.100 and in declining strength) between vehicle annual mileage and household income, vehicle emission rate and (somewhat weak) vehicle ownership itself (0.094**); there is significant negative correlation for age and (a somewhat weak) household size (-.095***).

There are also significant (but weak) negative correlations for number of passengers, those who responded as somewhat liberal, female, census tract population density and having some college. The adjusted R^2 is weak to moderate at .107 (model 6) with a significant F value at 10.255. Additionally, though it may seem strange to add the vehicle ownership variable into these analyses—as it should be presumed from having annual mileage values, vehicle ownership has a somewhat weak relationship to mileage, suggesting that ownership, in and of itself, does not dictate how much someone will drive, which also suggests a broad range of distance driving practices (which is confirmed in Table 4, descriptive statistics, where the standard deviation for annual mileage is greater than the mean). In contrast, as revealed in Table 5, vehicle ownership variable has a strong association with emission rates as there is, relatively, not a wide range of rates. In other words, once someone purchases a vehicle, they are “locked in” to a specific range of emission rates. At least regarding this sample (from 2008) where there happened to be no cases of “zero-emission” vehicles.

Table 5. Primary vehicle emission rate (gCO_2/mile) regressed on demographics, neighborhood effects, household income, climate change beliefs, vehicle mileage and ownership (standardized).

	1 Base demographic	2 Neighbor-hood effect	3 Household income	4 Climate change belief	5 No. of cars & annual mileage	6 Vehicle ownership
(Constant)	.--***	.--***	.--***	.--***	.--***	.--
Age	0.096***	0.091***	0.111***	0.115***	0.133***	0.042***
Female	-0.056***	-0.048**	-0.022	-0.020	0.002	-0.014
Some College	0.032	0.049**	-0.021	-0.022	-0.015	-0.022
Bachelor's Degree	0.031	0.052**	-0.053**	-0.049**	-0.044**	-0.059***
Master's or higher	0.012	0.043*	-0.071***	-0.064***	-0.053**	-0.052***
Black	-0.104***	-0.089***	-0.032	-0.032	-0.023	0.006
Other (non-Hispanic)	-0.082***	-0.068***	-0.053***	-0.056***	-0.044**	-0.008
Hispanic	-0.094***	-0.048**	-0.029	-0.027	-0.022	-0.004
Two or More Races	-0.022	-0.023	-0.010	-0.008	-0.007	-0.011
Household Size	0.143***	0.124***	0.014	0.012	-0.011	0.019
Number of passengers	0.236***	0.243***	0.234***	0.238***	0.218***	0.076***
Very Liberal	0.019	0.022	0.030	0.039*	0.037*	-0.009
Somewhat Liberal	-0.045*	-0.019	-0.035	-0.028	-0.030	-0.046***
Somewhat Conservative	0.056**	0.049**	0.043**	0.038*	0.010	-0.001
Very Conservative	0.049**	0.042*	0.030	0.025	0.012	0.015
Refused	-0.059***	-0.062***	-0.051***	-0.051***	-0.045**	-0.003
CT Median income		0.074**	0.027	0.024	0.013	0.033*
CT %BA Degree-more		-0.038	-0.042	-0.041	-0.020	-0.030
CT Median home value		-0.088***	-0.089***	-0.084***	-0.067**	-0.030
MSA Status		-0.048**	-0.053***	-0.054***	-0.045**	-0.016
CT Pop. density		-0.149***	-0.159***	-0.159***	-0.140***	-0.023
Household income			0.371***	0.396***	0.292***	0.057***
Alarmed				0.079	0.053	-0.042
Alarm * income				-0.138***	-0.105**	-0.002
Number of cars					0.229***	0.047***
Mileage/year					0.141***	0.043***
Own a vehicle						0.727***
Adjusted R^2	0.115	0.154	0.247	0.251	0.316	0.670
F value	17.919***	19.091***	32.154***	30.115***	38.127***	158.180***
Number of Observations	2091	2091	2091	2091	2091	2091

Source: Climate Change in the American Mind Survey (2008); US Census Bureau (2015);
Abbreviations: CT Census Tract; MSA Metropolitan Statistical Area;
.-- indicates reference category, * $p < .10$, ** $p < .05$, *** $p < .01$

Table 6. Number of vehicles owned regressed on demographics, neighborhood effects, household income, climate change beliefs, primary vehicle emission rate and mileage (standardized).

	1 Base demographic	2 Neighbor-hood effect	3 Household income	4 Climate change belief	5 CO_2 rate (gCO_2/m) mileage
(Constant)	--***	--***	--***	--***	--
Age	-0.028	-0.034	-0.018	-0.018	-0.044*
Female	-0.090***	-0.084***	-0.063***	-0.064***	-0.057***
Some College	0.045*	0.053**	-0.001	-0.004	0.004
Bachelor's Degree	0.042*	0.052**	-0.028	-0.030	-0.018
Master's or Higher	0.031	0.045*	-0.043*	-0.043*	-0.026
Black	-0.074***	-0.063***	-0.018	-0.018	-0.008
Other (non-Hispanic)	-0.046**	-0.037*	-0.025	-0.026	-0.010
Hispanic	-0.067***	-0.045*	-0.030	-0.029	-0.023
Two or More Races	-0.023	-0.023	-0.013	-0.012	-0.011
Household Size	0.253***	0.244***	0.158***	0.157***	0.157***
Number of passengers	0.094***	0.091***	0.085***	0.085***	0.025
Very Liberal	0.002	0.009	0.015	0.015	0.005
Somewhat Liberal	0.035	0.048**	0.035	0.037	0.046**
Somewhat Conservative	0.098***	0.096***	0.092***	0.092***	0.080***
Very Conservative	0.072***	0.068***	0.059***	0.059***	0.053**
Refused	-0.017	-0.019	-0.010	-0.009	0.005
CT Median Income		0.100***	0.063**	0.063**	0.058**
CT %BA Degree-more		-0.059*	-0.062**	-0.062**	-0.050*
CT Median Home Value		-0.062*	-0.063**	-0.063**	-0.041
MSA Status		-0.048**	-0.052**	-0.053**	-0.039*
CT Pop. Density		-0.023	-0.031	-0.030	0.014
Household Income			0.287***	0.303***	0.191***
Alarmed				0.079	0.056
Alarmed * Income				-0.082	-0.043
gCO_2/mile					0.256***
Mileage					0.040**
Adjusted R^2	0.117	0.125	0.180	0.180	0.233
F value	18.273***	15.206***	21.882***	20.155***	25.467***
Number of Observations	2091	2091	2091	2091	2091

Source: Climate Change in the American Mind Survey (2008); US Census Bureau (2015); EPA (2015)
Abbreviations: CT Census Tract; MSA Metropolitan Statistical Area;
-- indicates reference category, * $p < .10$, ** $p < .05$, *** $p < .01$

Table 7. Primary vehicle annual mileage regressed on demographics, neighborhood effects, household income, climate change beliefs, vehicle emission rate and ownership (standardized).

	1 Base demographic	2 Neighbor-hood effect	3 Household income	4 Climate change belief	5 CO_2 rate (gCO_2/m) mileage	6 Vehicle ownership
(Constant)	--***	--***	--***	--***	--***	--***
Age	-0.114***	-0.116***	-0.104***	-0.102***	-0.122***	-0.124***
Female	-0.069***	-0.067***	-0.051**	-0.049**	-0.042**	-0.044**
Some College	-0.009	0.000	-0.043*	-0.044*	-0.040	-0.042*
Bachelor's Degree	0.064***	0.075***	0.010	0.012	0.023	0.018
Master's or Higher	0.041 *	0.058**	-0.013	-0.009	0.005	0.002
Black	-0.064***	-0.065***	-0.030	-0.029	-0.023	-0.020
Other (non-Hispanic)	-0.051**	-0.049**	-0.040*	-0.041*	-0.030	-0.028
Hispanic	-0.014	-0.004	0.008	0.010	0.016	0.017
Two or More Races	0.005	0.004	0.013	0.013	0.016	0.015
Household Size	-0.011	-0.020	-0.088***	-0.089***	-0.099***	-0.095***
Number of passengers	-0.002	0.001	-0.004	-0.002	-0.049**	-0.053**
Very Liberal	-0.016	-0.017	-0.012	-0.006	-0.014	-0.018
Somewhat Liberal	-0.050**	-0.041*	-0.050**	-0.046*	-0.043*	-0.047*
Somewhat Conservative	0.062**	0.056**	0.052**	0.049**	0.038	0.037
Very Conservative	0.010	0.007	-0.001	-0.003	-0.011	-0.010
Refused	-0.033	-0.033	-0.027	-0.027	-0.017	-0.014
CT Median Income		0.006	-0.023	-0.025	-0.033	-0.029
CT %BA Degree-more		-0.042	-0.044	-0.044	-0.033	-0.036
CT Median Home Value		-0.017	-0.018	-0.014	0.004	0.005
MSA Status		0.021	0.018	0.017	0.030	0.030
CT Pop. Density		-0.075***	-0.081***	-0.081***	-0.050**	-0.044*
Household Income			0.230***	0.247***	0.160***	0.149***
Alarmed				0.059	0.041	0.032
Alarmed * Income				-0.096	-0.067	-0.061
gCO2/mile					0.184***	0.117***
Number of cars					0.047**	0.039
Own a vehicle						0.094**
Adjusted R^2	0.031	0.038	0.074	0.075	0.104	0.107
F value	5.152***	4.942***	8.539***	8.016***	10.366***	10.255***
Number of Observations	2091	2091	2091	2091	2091	2091

Source: Climate Change in the American Mind Survey (2008); US Census Bureau (2015); EPA (2015)
Abbreviations: CT Census Tract; MSA Metropolitan Statistical Area;
-- indicates reference category, * p < .10, ** p < .05, *** p <.01

Discussion

In this study, I set to explore how a material item, the automobile, might channel insights of sociocultural character through the notion of visibility. Specifically, I have hypothesized that (1) the more visible attributes of the automobile (emission rate) would be more prone to sociocultural and economic influences than the lesser visible attributes (number of cars and mileage), and (2) these lesser visible attributes of the automobile would be more prone to economic influences than sociocultural. From one point of view, I can affirm both hypotheses on both counts, depending of course on the viability of the operationalization for vehicle visibility: (in declining influence) emission rate, number of cars, and annual mileage. In each successively "less visible" regression analysis, the R^2—the power to "explain"—progressively declines (Hypothesis 1). This is also supported by the sheer number of significant associations in each analysis: 14 significant variable relationships for vehicle emission rate (model 5) and 12 and 10 significant relationships for number of cars and annual mileage, respectively (both model 6). Though a number of these relationships are weak, their significance does suggest a greater degree of sociocultural association as originally hypothesized. Also, in an exercise to measure the influence of household income: I summed the significant values in each analysis and calculated the contribution of household income—14.4%, 17.8%, and 18.4%, respectively, and found that income successively rose in associative "influence" (Hypothesis 2).

However, as already suggested, income could be considered as more than just money—a proxy for something else, a class culture or income lifestyle (Boucher 2016a, 69)—and therefore regarding these hypotheses and findings, I can critique my own methods of inquiry: how well is one able to operationalize sociocultural versus economic influences? Consequently, this is perhaps a call for future cultural research to target household income as the dependent variable and explore the "sociocultural" associations and markers, i.e., environmental attitudes, behavioral inclinations, positional goods, "accoutrement," energy use, and related GHG emissions. Though there is an academic subdiscipline called behavioral economics, economists might miss cultural markers.

When digging deeper into the details of the regression analyses and when considering them all at a glance, the strongest association—the strongest or second strongest—is household income: significant and positively correlated in all analyses. Regarding a "runner-up" association, there is something of a collection of related variables: emission rate, household size, number of passengers, number of cars owned. These findings appear to corroborate those of Flamm (2009) who reported a clustered association between income, emission rate, cars owned, and mileage. Consequently, as these factors—excluding income—are those that are multiplied to calculate vehicle GHGEs, it is then a mathematical corollary that the affluent are generally the greater vehicle GHG emitting population—something already shown with this data (Boucher 2016a)—and therefore an instance of Freudenburg's (2005, 2006) disproportionality and privileged access. In Flamm's (2009) dataset though, he had the number of licensed drivers per household—which ultimately dominated his models, a variable I did not have. It is easy to surmise that the number of licensed drivers will also relate to household size and perhaps number of passengers—variables I have and of which there is bivariate correlation—see Table 8, Appendix.

Table 8 reveals the collinearity of a number of select variables; some of the more primary and neighborhood effect type. It is notable that household income has a positive significant correlation with each variable. Moreover, it is easy to imagine that larger households will likely house more income earners and therefore have a greater need for additional cars. However, in these analyses, I control for household size and still all the vehicle conceptualized attributes are positively associated with income. This finding, echoing Flamm's (2009), supports the notion of an "accoutrement of class," at least with respect to the automobile. Namely, with each successive increment of income—what Bourdieu (1984) would refer to as "class fraction," there is incremental growth in materiality: vehicle emission rate, annual mileage, and number of cars. These material, behavioral, status-positional phenomena appear to be clustering, rising and falling in unison; also calling to mind Bourdieu's (1984) idea of a class habitus.

As well as being framed as the most visible attribute, emission rate has the highest association with number of vehicles owned, trumping income, and is second to income in its association with annual mileage. It is, in turn, the strongest marker of, if I might say, a culture of number-of-cars-owned. This is an unexpected finding.[32] Additionally, these entangled associations suggest some form of an endogenous, symbolic/instrumental, human-automobile relationship. They also echo Flamm's (2009) findings and deserve greater research attention. For instance, it might have been thought that someone who drives more would also drive a more fuel-efficient vehicle, but this does not bear out from the evidence. Perhaps, those who drive more opt for the safety of a larger vehicle, or perhaps those who are more affluent just buy what and drive how they want? Ultimately, as motivations were not the subject of this study, it is unclear whether, for instance, people behave in clustered ways out of—returning to the review of the literature: a desire for belonging, envy or positionally "keeping up," moments of mimesis/imitation, managing impressions, personal identity, or perhaps some other or nonconscious reason.

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[32] Flamm (2009), however, found that the number of cars owned was more highly associated with the number of licensed drivers in a household, but I did not have access to this variable.

There is also a strong positive correlation between emission rates and number of passengers—which logically seems to necessitate a larger vehicle—and miles driven per year. It might have been hypothesized that those with higher mileage rates might drive more efficient—less emissive—vehicles, but this does not bear out in these findings. In both analyses there were significant correlations with age: positive for emission rate and negative for yearly mileage. This means that older persons or those from an older generational cohort drive larger cars, but they drive them less than others.

With respect to census tract population density, there was a moderate significant negative correlation between density and vehicle emission rate and a similar (negative) but weaker relationship with annual mileage, suggesting a rural/urban continuum where higher densities associate with more fuel-efficient vehicles and driving less. This may relate to public transportation options and/or culturo-spatial patterning. For instance, it is not difficult to imagine two things: there may be an established rural custom of identifying with farming or ranching and the instrumental need for a (less fuel efficient) pickup truck: this custom may have reproduced itself as an affective or symbolic marker as the instrumental need dissipated. Second, more rural areas, being less densely populated, may have longer distances between worksites and social amenities causing higher annual mileage. However, this relationship is more complicated than a quick speculation, there is evidence that people in less dense areas travel less frequently (Millward and Spinney 2011). This finding of a density association with the automobile identifies some limitations in this study: neither including the availability of public transport nor how people drive. For instance, some scholars (André 2004; Eisenmann and Buehler 2018) have analyzed people's driving habits and categorized driving types: patterns, frequency, cycles, adherence to speed limits, and also driving conditions.

Regarding the "traditional" demographic and neighborhood effect variables, age is perhaps the more prominent and singular: with emission rate increasing and annual mileage decreasing with age. There are other relationships that could be noted, but they are weaker. Aside from a weak negative correlation between emission rate and "Other (non-Hispanic)"—the catch all for "Asian" with respect to the referent category White—there are no racial/ethnic associations—their showing in the earlier models they were apparently proxies for income.

There are few singularly strong associations in contrast to groupings of weak ones: the census tract associations in both the emission rate and number of vehicles analyses; the negative emission rate association with higher education; and the positive association with number of cars for those claiming a conservative political ideology. These associations—weak or not—appear to affirm that peer effects matter and that there are cultures and types of goods and behaviors related to one's contexts and social standing. These findings also point to a type of group behavior, "group think," or tribalism. Kahan (2008) has referred to this phenomenon as *cultural cognition*.

When examining environmental attitudes: being "Alarmed" by climate change is inconsequential with respect to the number of cars in a household or the annual mileage of its primary vehicle. Only with emission rate is there a significant negative association from the interaction of income and an "Alarmed" belief segment. As Burgess (2016) argues that affluence grants its bearer a greater range of carbon intensive lifestyles, perhaps when someone is relatively freed of economic constraints, they have more opportunities to live their values, whether they be pro- or non-environmental values. However, from my general findings, which are in accord with the income-carbon relationship (Boucher 2016a), it seems that greater income grants its possessor greater power to pollute, and in multiple behavioral dimensions. Moreover, without external constraints, like social norms, on one's personal freedoms and temptations to consume (Gatersleben, Steg, and Vlek 2002), it appears difficult to eco-responsibly steward one's own economic power.

So what?

What then is to be learned from this study? Considering the climate urgency and the need to rapidly reduce anthropogenic GHG emissions, if policymakers are not able to target carbon or fossil fuel consumption via limits/capping and/or taxation—or some "carrot/stick" type incentive, they could constrain household income or consider making undesirable products and behaviors more visible while framing them negatively. In turn, desired behaviors could be framed more positively and also made more visible, perhaps spurring some type of green competition or emulation (Griskevicius, Tybur, and Van den Bergh 2010). Following this thinking, if electric cars are to be marketed in attempts to help mitigate climate change, could they and their charge points be made more visible and more clearly identifiable? In the U.S., it is generally obvious where gas stations are located: could charge points be the same? Additionally, visibility is not just for the users of a product or service, but for non-users: in order to catalyze interpersonal comparisons and mimesis—and the other related concepts reviewed in this study.

Finally, returning to an early question: might the motor vehicle play something of a marker for the human response to global climate change? From the findings, if the automobile is marking a response, then the response is weak—at least according to this 2008, U.S. survey. However, the markings of a good or service, positional or otherwise, might be different in the U.S.; perhaps this research could be duplicated in another context to check for possible differences and their implications for "visibility in context."

Conclusion

Returning to the literature—and though aggregate measures of carbon emissions were not specifically considered, this study can be added to those that affirm an *income-carbon relationship* (Boucher 2016a; Gatersleben, Steg, and Vlek 2002; Sanne 2002) and the weak capacity of an environmental attitude to overcome the associations of income (Boucher 2016a; Csutora 2012; Gatersleben, Steg, and Vlek 2002; Wilson, Tyedmers, and Spinney 2013). Though I did find an association between vehicle emission rate and the interaction of an Alarmed climate change attitude and household income, there were no direct effects for climate change belief in any of the analyses. Concerning visibility, there were stronger significant associations between sociocultural measures and the conceptualized more visible vehicle attribute—emission rate—than the less visible attributes of number of vehicles and estimated vehicle mileage per year.

While not ignoring the limitations of this study, I will argue that greater household income provides and/or enables its possessor with greater powers to purchase, consume and, under the conditions of this 2008 U.S. dataset, pollute. Additionally, sociocultural forces through visibility have the capacity to both constrain and enable this consumption and polluting capacity. Future analysts and policy makers who wish to reduce the carbon generating capacity of individuals embedded in car cultures (Miller 2001a), should consider the primacy of visibility and income when designing future policy tools.

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Appendix

Table 8. Select bivariate correlations.

Annual mileage	Household Size	Number of Passengers	CTMedian income	CT %BA Degree or More	CTMedian Home Value	MSA Status	CT Pop. Density	Household income	Emission rate	Number of cars owned	Annual mileage
Number of Passengers	.361**										
CT Median income	.000	-.020									
CT %BA Degree or more	-.057**	-.078**	.664**								
CT Median Home Value	-.031	-.002	.651**	.643**							
MSA Status	.001	-.004	.207**	.223**	.250**						
CT Pop. Density	-.042	.063**	.132**	.293**	.388**	.154**					
Household income	.298**	.089**	.241**	.204**	.173**	.066**	.058**				
Emission rate	.177**	.247**	-.014	-.111**	-.142**	-.097**	-.199**	.320**			
Number of cars owned	.286**	.162**	.028	-.052*	-.060**	-.066**	-.071**	.331**	.379**		
Annual mileage	.028	-.001	-.015	-.044*	-.056*	-.001	-.095**	.206**	.243**	.159**	
Car ownership	.146**	.214**	-.001	-.062**	-.108**	-.080**	-.194**	.373**	.802**	.395**	.246**

****. Correlation is significant at the 0.01 level (2-tailed); *. Correlation is significant at the 0.05 level (2-tailed).**

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CHAPTER SIX

COMMUNITY-BASED RESOURCE SHARING: MOTIVATIONS AND SPILLOVER EFFECTS

SPENCER HARBO AND RAYMOND DE YOUNG

Abstract

It can be argued that the sharing of resources has been an integral part of collective society throughout human history. Sharing food, tools, skills, and ideas has allowed humans to adapt to new environments, build communities, and organize the cities where the majority of our global population now lives. However, the current availability of cheap fossil fuels and advances in production technology have accompanied hyper-individualized and highly-consumptive lifestyles. Individual ownership and the rapid replacement of nondurable goods is now the norm among affluent populations within techno-industrial societies. Because humans live on a planet of finite resources, we face the growing challenge of reducing consumption in affluent areas by using those resources more responsibly. Providing opportunities for affluent communities to share physical goods and services may help present a path forward to a new normal in which the planet's increasingly limited resources are used more collaboratively, equitably, and sustainably. In a mixed-methods study of community members in Southeastern Michigan (N=274), the motivations for and conditions that facilitate community-based resource sharing were explored. The conditions that facilitated sharing included convenience, community support, and enjoyment. Common motivations included frugality, social participation, and meaningful action. Results from this study also indicate a spillover from sharing behaviors to other pro-environmental and pro-social behaviors, suggesting that a cultural shift toward community-based resource sharing may further influence values, norms, and actions toward "green citizenship." Policy makers, urban planners, and behavioral practitioners can incorporate these findings into the design of programs and initiatives that motivate community-based resource sharing, thereby promoting

sustainable consumption and fostering transitions to a more equitable and resilient future.

Introduction

> *"We belong in a bundle of life. We say, 'A person is a person through other people...I am human because I belong. I participate, I share.'"*
>
> Desmond Tutu (1999, 31)

The overconsumption of natural resources to meet a global society's growing material demands is causing environmental degradation and changes to the planet's climate that will affect current and future generations (Stocker et al. 2013). The hyper-individualized and hyper-consumptive lifestyles of affluent populations within techno-industrial societies are also contributing to economic inequality (Piketty and Saez 2014) and a decrease in social capital and cohesion (Putnam 2000). Human beings live on a planet of finite resources (Meadows et al. 1972) and a sustainable use of those resources involves consuming them responsibly without compromising the needs of future generations (Norwegian Ministry of the Environment 1994).

Yet, those of us in the more affluent world live in an era characterized by the ever-increasing production and consumption of resources. For example, while the average U.S. family size is steadily decreasing, home size and resource use per home continue to increase (Wilson and Boehland 2005). The United States alone consumes 25% of the world's fossil fuels, even though it comprises only 5% of the global population (Worldwatch Institute 2015). People living in the U.S. now generate more than 250 million tons of trash each year (EPA 2018), a signal of the extent to which the U.S. economy promotes the production and consumption of goods that are used briefly and then discarded, rather than held onto, given a new home, or re-purposed for future use.

Scholars argue that depleting natural resources and fossil fuels may soon make the transition to less resource-intensive and more localized ways of living not an option, but a biophysical necessity (De Young 2014; Hopkins 2008, 141-71). Localization, characterized by a societal shift to more sustainable behaviors within place-based communities, describes a response to climate change and declining natural resources, but also a movement toward more equitable and socially engaged ways of living that are responsive to the culture and history of local communities (De Young and Princen 2012). Some of the more striking examples of such initiatives include Ecovillages (Litfin 2014), TimeBanks (Seyfang 2004), and Transition Towns (Hopkins 2008), but many other opportunities exist for engaging with intentional communities that share resources, skills, and services at the local level.

Examples of localization initiatives highlight aspects of green citizenship, which involves going beyond consumer actions of purchasing green products to pursuing socially conscious and environmentally responsible actions within one's community (Hamilton, Guckian, and De Young 2018). It is now evident that these actions are needed at the individual and household level to mitigate the human impact on the environment (Thøgersen 2014). However, promoting green citizenship behaviors is not an easy endeavor. Creating a sustainable society is not as simple as adopting a pro-environmental outlook (Kollmuss and Agyeman 2002). There are not only political, economic, and physical barriers to green behaviors, but psychological barriers as well (Gifford 2011).

Policies and technologies that promote cleaner and more efficient uses of energy are no doubt important for responding to climate change, but a behavioral shift to less energy-intensive and consumptive patterns of living is critical to achieving a more sustainable use of the planet's limited resources. Achieving this goal will require a transition to a new way of thinking about how those of us in affluent societies consume resources and, perhaps equally important, how we share them.

The modern sharing economy

It can be argued that organized civilization formed as a response to the need to share physical and social resources. Moving into urban societies allowed people to share skills, labor, infrastructure, tools, food, and experiences. However, advances in production technology have ushered a transition from collaborative use to a more hyper-individualized consumption of resources. As a result, there is currently a greater focus on innovation, but much less on maintaining things for long-term use (Vinsel and Russell 2016). Initiatives such as planned obsolescence (Bulow 1986) purposefully make it more difficult, or socially unacceptable, to share durable goods among individuals or across generations. In addition to the environmental costs of a throwaway culture, there are social costs as well. A focus on individual attainment has led to spending an increased amount of time alone and, therefore, less time engaging with other people in community (Putnam 2000).

Yet, the notion of sharing appears to be taking on new and important meaning in the 21st century. The modem concept of the sharing economy is seen as an alternative economic structure centered on using already existing goods and services. Sharing economies include the peer-to-peer distribution of physical resources like cars, household goods, and workspace, but can also include less-tangible items like services, time, and skills (Botsman and Rodgers 2011). This notion runs counter to the current narrative of ever-increasing production and the sovereignty of consumers (Princen 2001) and may provide a path toward a more sustainable consumption of resources (Heinrichs 2013).

However, sharing economy initiatives are not inherently sustainable and may serve to increase consumption, or simply shift it from one sector to another (Cooper and Timmer 2015, 9-10). Indeed, the concept of a sharing economy has been used by corporations that do little beyond pursuing business-as-usual. For example, ride sharing services have tapped into global markets with possible adverse consequences for the environment (Schor 2016) and labor practices (Rogers 2015).

Community-based resource sharing

Community-based resource sharing, on the other hand, describes those behaviors that involve the sharing of both physical and social resources at the local level, with the goal of reducing consumption and promoting quality of life. It is not simply an economic opportunity, but a path forward to providing communities with physical and social resources without compromising the needs of future generations.

From the perspectives of environmental and social sustainability, successful examples of local sharing initiatives can be characterized by living within ecological means by reducing material consumption, protecting and restoring natural systems, building resilience to climate change, promoting equity and social inclusion, supporting local economies, and advancing quality of life by fostering social connections (Cooper and Timmer 2015, 57).

Community-based resource sharing can be as simple as the already common presence of thrift stores, community gardens, and housing cooperatives, or they can be more socially experimental initiatives like TimeBanks (Seyfang 2004), Transition Towns (Taylor 2012), and Ecovillages (Litfin 2014). There are now even organizations like *The Maintainers* that seek to shift engineering and design discourse from innovation to the using, maintaining, and improving of those things we already have (Vinsel and Russell 2016).

Conditions that support sharing

There are numerous conditions—physical, social, political, psychological—that support human behaviors. Consumption behaviors are no different, but perhaps they are more complex in the sense that individual choices may directly affect the environment and the consequences of actions may be non-localized and often delayed to some unknown future. Understanding the conditions under which people pursue green behaviors is therefore crucial to sustainability initiatives.

Because the consumption of resources and the release of greenhouse gases into the atmosphere is a product of individual and collective behaviors, changing those behaviors is critical to a sustainable future. Providing information to influence the knowledge and attitudes of individuals is rarely sufficient to promote durable behavior change (Kollmus and Agyeman 2002). More likely, fostering lasting change will require tapping into deeper psychological motivations. Changing behaviors is not easy; it is a multi-step process that involves identifying psychological motivations that support target behaviors so that they may be promoted through interventions (McKenzie-Mohr 2001).

Psychological motivations that support green behaviors include norms and cultural influences (Kollmuss and Agyeman 2002), the practicality of a given behavior (Blake 1999), and perceived effectiveness in pursuing that behavior (Vermeir and Verbeke 2006). Uncovering these psychological characteristics is perhaps just as significant as policy or urban design in promoting successful resource sharing programs at the local level.

Previous research has uncovered a range of motivations for participating in community-based resource sharing, which include instrumental goals, altruism, and social connections (Bellotti et al. 2015), along with interests in sustainability, enjoyment and economic gains (Hamari et al. 2015). While there are both intrinsic (e.g., contentment) and extrinsic (e.g., financial) motivations for sharing, focusing on intrinsic satisfactions may provide added benefits in the form of more long-term behavior change (De Young 1993).

The role of intrinsic satisfaction

Promoting durable behavior change may be aided by framing actions as potentially intrinsically satisfying, thus making them more likely to be self-maintaining (De Young, 1993, 2000). Intrinsically satisfying behaviors are pursued because the actions themselves are rewarding, not because of financial incentives, social pressure, or other external motivations. This suggests that an environmentally responsible behavior like recycling may be adopted because not only it is good for the environment, but also because there is an intrinsic satisfaction gained from being effective at managing household waste.

Kaplan and Kaplan (2009) have demonstrated that humans have an intrinsic desire to explore, understand our environments, become competent in our actions, be part of a solution to a problem, and participate meaningfully with other people. Intrinsic motivations that are particularly relevant to green behaviors like community-based resource sharing may also include being resourceful (frugal), being part of a thriving group, helping others, and developing skills (De Young 1993, 1996).

It is important to note that it is wholly possible to maintain a desired level of material well-being while also living frugally (De Young 2000). An effective way to accomplish this may be through sharing resources with others in one's community, which could allow one to have access to a broad range of material goods while also participating socially and improving one's community and the environment.

Tapping into intrinsic satisfactions holds promise for fostering durable environmentally responsible behaviors by minimizing the reliance on extrinsic rewards or social policies that tend to only support behaviors when those rewards or policies are in place (De Young 1993; van der Linden et al. 2015). Intrinsic motivations are enhanced when one gains a feeling of competence and, at the same time, a sense of autonomy (Ryan and Deci 2000). There is also the possibility of a generalizing of this effect. The intrinsic satisfactions derived from resource sharing behaviors might spill over, leading an individual to pursue other green behaviors from which they might expect to derive similar satisfactions.

Spillover to other behaviors

Conservation initiatives have traditionally targeted specific behaviors and created conditions that tend to support only those behaviors, like recycling, reducing household energy use, or taking public transportation. However, fostering lasting environmental stewardship may greatly benefit from behavioral spillover, a phenomenon wherein the pursuit of one behavior leads to the future pursuit of a second behavior, either in the same direction (in the case of positive spillover) or an opposing direction (in the case of negative spillover) (Dolan and Galizzi 2015). For example, recycling at home may lead one to pursue water and energy conservation (positive), or rather it could lead to more plane travel (negative) as a reward for the pro-environmental recycling behavior (Thomas and Sharp 2013).

Fostering a spillover phenomenon to promote green behaviors would be easy if there already existed a strong culture of sustainability. Until such a culture is well established, it is necessary to leverage other methods of motivating environmental stewardship behaviors.

Research has shown that there is the potential for spillover from specific actions, such as green purchasing, to other environmentally responsible behaviors (Lanzini and Thøgersen 2014). But, positive spillover does not always occur and may depend on both the type of behavior and the motivation for pursuing that behavior (Truelove et al. 2014), including an individual's intrinsic values and norms (Thøgersen and Ölander 2003). Therefore, understanding an individual's intrinsic motivations is also critical to being able to promote spillover effects to other pro-environmental or pro-social behaviors.

The questions addressed in the research reported here are: First, what intrinsic motivations support community-based resource sharing behaviors among residents in a techno-industrial society? Second, do sharing behaviors and their derived intrinsic motivations lead to the adoption of other categories of pro-environmental or pro-social behaviors? Because community-based resource sharing involves location-specific behaviors, we set out to answer these questions at the community level.

Method

To understand the range of intrinsic motivations supporting community-based resource sharing and the effect sharing has on other pro-environmental and pro-social behaviors, a mixed-methods survey was administered to five communities in Southeastern Michigan. The present study set out to highlight the motivations for participation in community-based sharing initiatives, the conditions that support sharing behaviors, and potential spillover to other socially and environmentally responsible behaviors.

Sample and procedure

This study was conducted in five cities within Southeastern Michigan (Ann Arbor, Chelsea, Detroit, Dexter, and Ypsilanti). These communities were selected as comparison sites due to their diversity in size, population, and demographic makeup. Yet, they all existed within the same techno-industrial society containing similar educational, informational and economic systems. To guide the development of a community-based survey, key informant interviews (n=11) were conducted in each city with leaders of community resource-sharing organizations, including reuse centers, collaborative workspaces, and TimeBanks, as well as more traditional service-sharing groups like senior centers and Rotary Clubs.

These key informant interviews were used to inform a larger community survey (N=274) that was distributed to members of sharing organizations within the five cities. However, in order to obtain a representative sample that varied in age, income, and employment status, seniors from local senior centers and students from the University of Michigan were also invited to participate in the study (see Table 1). The survey instrument was administered on the internet through the Qualtrics survey platform. Paper copies of the survey instrument were provided to organizations whose members did not have regular computer access.

Table 1. Respondent characteristics*

Gender (n=244)	*Freq.*	*%*	*Neighborhood Type (n=249)*	*Freq.*	*%*
Male	76	31	Urban	74	30
Female	167	68	Suburban	112	45
Another gender	1	0.4	Rural	63	25
Employment (n=247)	*Freq.*	*%*	*Residence (n=236)*	*Freq.*	*%*
Employed for wages	93	38	Ann Arbor	95	40
Self-employed	24	10	Chelsea	49	21
Unemployed	3	1	Detroit	22	9
Student	83	34	Dexter	33	14
Retired	44	18	Ypsilanti	19	8
			Other Urban Areas	2	1
			Rural SE Michigan	16	7
Income (n=181)	*Freq.*	*%*			
$15,000-$49,999	56	31			
$50,000-$99,999	67	37			
$100,000-$149,999	34	19			
$150,000 $199,999	17	9			
$200,000 or more	7	4			

* All percentages add to 100%.

The four main constructs being investigated in this study were the frequency of sharing goods or skills in one's community, the motivations for sharing, conditions that would promote one's sharing behaviors, and the spillover from sharing behaviors to other pro-environmental and pro-social behaviors. These constructs were analyzed using exploratory factor analysis. Factors were extracted using principal component analysis, Varimax rotation, and Kaiser normalization. A variable was accepted as measuring a latent category if its loading was .50 or greater and if it did not double-load on another category at or above that same value. The relationships among the resulting categories were then analyzed using stepwise linear regression, treating first sharing behaviors and then spillover behaviors as the dependent variable.

Results

Factor Analysis

To identify common sharing behaviors, respondents were given the prompt, "Please indicate how often you do the following in your community." Sharing behaviors were defined as the sharing of both physical resources (e.g., borrowing, lending, renting, donating, buying used, selling used, co-owning) and non-physical resources (e.g., sharing skills or expertise, volunteering or exchanging time). The term "sharing" was defined by these kinds of activities throughout the survey. Responses were recorded on a five-point Likert scale from "never" to "very frequently." These items were created from previous research on behaviors relevant to local sharing economies (Bellotti et al. 2015; Botsman and Rogers 2011).

Exploratory factor analysis identified two statistically independent forms of sharing behaviors pursued by the survey respondents (Table 2). The first category included responses framed as exchanging skills and time ($\alpha = .69$). The second category included the exchanging of more physical items, including borrowing, buying, and selling used items ($\alpha = .68$). The existence of these statistically independent behavioral categories indicates that respondents appear to conceptualize the sharing of physical and non-physical resources as separate and distinct behaviors.

Table 2. Sharing behavior categories

Category names and items*	Loading	Mean**	S.D.	Alpha
Exchanging Skills and Time		3.53	.99	.69
Volunteer or exchange your time	.89			
Share skills or experience with others	.85			
Exchanging Physical Items		2.74	.86	.68
Buy used items	.80			
Sell used items	.78			
Borrow items for free	.75			

* Stem question was "*Please indicate how often you do the following in your community*." The 5-point Likert scale ranged from 1=Never to 5=Very Frequently.
** Means are significantly different at p ≤ .001

Other actions, such as renting, donating, lending, and co-owning items, did not load highly with either of these categories and were removed at a factor-loading cutoff of .50. One variable, lending things to other people, was removed from analysis because it double-loaded with both categories at ≥ .50. The two behavior categories are only weakly correlated at r = .17.

Motivations cited for pursuing sharing behaviors, as defined by the measures below, were captured by the prompt, "In general, which of the following are your main reasons for sharing?" Responses were recorded on a five-point Likert scale from "not at all" to "extremely." Since the motivations in question are derived from the behaviors themselves, they can be conceptualized as cited intrinsic satisfactions. The items in the survey instrument were developed from previous research on intrinsic satisfactions for conservation behavior (De Young 1996, 2000) and motivations for participating in sustainable consumption (Bellotti et al., 2015).

The factor analysis extracted three statistically independent motivations for community resource sharing (Table 3). These included intrinsic satisfaction derived from meaningful action (α = .81), social participation (α = .85), and frugality (α = .85). The relationship between frugality and social participation (r = .27), frugality and meaningful action (r = .45) and social participation and meaningful action (r = .40) were each only modestly correlated.

Thøgersen (2014) identifies several limitations to changing consumption behaviors. These include limitations to time or financial resources, knowledge about problems and solutions, and skill- and task-specific knowledge. Initiatives to promote sustainable consumption like resource sharing would have to overcome these barriers by fostering conditions that would support sharing. The physical and social conditions that would facilitate opportunities for sharing resources within one's community were captured by the prompt, "Please indicate whether each of the following would make you more likely to share within your community." Responses were recorded on a five-point Likert scale from "not at all" to "extremely." These items were developed primarily from pre-survey conversations with key informants.

Table 3. Intrinsic satisfaction categories

Category names and items*	Loading	Mean	S.D.	Alpha
Meaningful Action		3.69	1.03	.81
Making your actions more sustainable	.86			
Reducing your impact on the environment	.82			
Making the world a better place	.72			
Social Participation		3.45**	.98	.85
Building relationships with others	.88			
Interacting with other people	.87			
Being more connected to your community	.81			
Improving your skills or abilities	.65			
Frugality		3.42**	.96	.85
Getting the things you need	.82			
Saving Money	.82			
Being effective at accomplishing tasks without buying things	.73			
Acquiring things more conveniently	.73			
Learning a better way to get the things you need	.68			

* Stem question was "*In general, which of the following are your main reasons for sharing?*" The 5-point Likert scale ranged from 1=Not at All to 5=Extremely.

** Means are not significantly different at $p \leq 0.001$

Factor analysis revealed a single category measuring the conditions under which opportunities for resource sharing would be facilitated, as shown in Table 4 (α = .86). Each of the items included in this category, even when considered alone, may be an important issue for an individual contemplating community-based sharing. The individual items with the higher mean scores are the following: more convenient ways (3.91); more information (3.89); greater contact with neighbors (3.65); increased community support (3.64); and more fun or enjoyment (3.62).

Table 4. Conditions that support sharing categories

Category names and items*	Loading	Mean	S.D.	Alpha
Conditions that support sharing		3.49	.86	.86
More convenient ways to share	.81			
Increased community support for sharing	.78			
More fun or enjoyable ways to share	.78			
More information about opportunities	.74			
Greater trust in community members	.71			
Greater contact with neighbors	.69			
More financial incentives for sharing	.65			
Increased access to transportation	.63			

* Stem question was "*Please indicate whether each of the following would make you more likely to share within your community.*" The 5-point Likert scale ranged from 1=Not at All to 5=Extremely.

Previous research has demonstrated the potential for spillover among environmentally responsible behaviors (Thøgersen and Ölander 2003). To gauge spillover from sharing to other behaviors, respondents were asked to indicate how much community-based sharing has led to other types of behaviors. Following the prompt, "Please tell us how much your experiences with sharing have led you to," was a list of pro-environmental and pro-social behaviors. Responses were recorded on a five-point Likert scale from "not at all" to "extremely."

Factor analysis identified the two statistically independent spillover categories of pro-social ($\alpha = .80$) and pro-environmental ($\alpha = .91$) behavior in the survey respondents' data (see Table 5). This suggests that prior involvement with sharing behaviors can promote, at least in the minds of the respondents, related but independent actions that focus on helping the environment or other people. The two categories of spillover behaviors were modestly correlated at $r = .49$.

Table 5. Spillover behavior categories

Category names and items*	Loading	Mean	S.D.	Alpha
Pro-Social Behaviors		3.46	1.09	.80
Volunteer or exchange your time	.88			
Share skills or experience with others	.88			
Pro-Environmental Behaviors		3.42	1.05	.91
Decrease the amount of things you buy	.86			
Think about your personal consumption	.84			
Try to use things past their normal life	.81			
Find ways to reduce waste	.79			
Do things that don't rely on buying stuff	.76			
Think about how your decisions will affect the environment	.75			

* Stem question was "*Please tell us how much your experiences with sharing in your community have led you to…*" The 5-point Likert scale ranged from 1=Not at All to 5=Extremely.

Each set of potential relationships were analyzed using stepwise linear regression. Respondent characteristics (Table 1) and the conditions that support sharing (Table 4) were also included in each analysis as potential predictors. All stepwise regression results shown are significant at $p \leq .05$.

Regression analyses suggest that for the sharing of physical resources, only the intrinsic satisfaction from frugality is a statistically significant predictor (Table 6). This finding is consistent with the practice of frugality as a focus on physical resourcefulness. The category measuring the existence of conditions that support sharing also significantly predicted the likelihood that one would pursue opportunities to share physical resources within their community. Respondents also reported that those who are self-employed are more involved with physical resource sharing. The category measuring intrinsic satisfaction derived from social participation was the only intrinsic motivation found to significantly predict the sharing of non-physical resources like time and skills. In addition, being older, a female, and a student significantly predicted this category of sharing behavior.

Table 6. Predicting sharing behaviors

Dependent Variable	Predictor Variables	R	R^2	Adjusted R^2
Physical resource sharing	Conditions for Sharing, Frugality, Self-Employed	.48	.23	.22
Non-physical resource sharing	Social Participation, Age, Gender, Student	.61	.38	.37

Regression analyses suggest that sharing physical goods spilled over to other pro-environmental behaviors (Table 7). Deriving intrinsic satisfaction from both meaningful action and frugality are also important in predicting the occurrence of pro-environmental behaviors. In addition, being self-employed or retired predicted the adoption of pro-environmental behaviors.

Table 7. Predicting spillover behaviors

Dependent Variable	Predictor Variables	R	R^2	Adjusted R^2
Pro-environmental behaviors	Meaningful Action, Frugality, Sharing Physical Resources, Self-employed, Conditions for Sharing, Retired	.77	.59	.58
Pro-social behaviors	Social Participation, Meaningful Action, Sharing Non-Physical Resources, Length of Residence, Conditions for Sharing, Frugality	.68	.47	.45

The regression analyses also suggest that the sharing of non-physical resources spills over to the adoption of pro-social behaviors. Deriving intrinsic satisfaction from social participation, meaningful action, and frugality were also found to be significant predictors of pro-social behaviors, as were length of residence in the community and conditions that supported sharing.

Discussion

The results reported above suggest that there are distinct and different intrinsic satisfactions motivating community-based sharing of physical versus non-physical resources. Furthermore, each form of community-based resource sharing spills over to the pursuit of comparable pro-environmental or pro-social behaviors. Within this sample of Southeastern Michigan residents, the more respondents derived intrinsic satisfaction from frugality, the more they reported sharing physical resources and pursuing additional pro-environmental behaviors. Similarly, the more respondents derived satisfaction from social participation, the more they reported pursuing non-physical (social) sharing behaviors and other pro-social behaviors. Therefore, we argue that the findings support making two recommendations. First, motivating a broad range of both pro-environmental and pro-social behaviors might begin with a focus on the conditions that support community-based resource sharing. Second, this focus should include the leveraging of intrinsic satisfactions.

The category that measured supportive conditions (Table 4) was a fusion of a significant number of conceptually separate conditions; no single item was more salient to the respondents. Indeed, it may be wise to support as many of these conditions as possible rather than privileging any single one of them. These efforts of support and/or promotion may include: creating more convenient opportunities for sharing resources, making opportunities for sharing more visible, and providing fun and enjoyable opportunities to engage in resource sharing with other community members. Providing these supporting conditions may help to create a gateway to engaging in sustainable consumption in one's community, during which derived intrinsic satisfactions are then experienced.

Past research has shown that intrinsic motivations to conserve resources can be nurtured and developed (Vining and Ebreo 1989) and that conservation behaviors can shift from being initiated by extrinsic rewards to being maintained by intrinsic satisfactions (Vining and Ebreo 1990). Leveraging intrinsic satisfactions in this way is likely to result in more durable and lasting change (De Young 1993). This may be especially relevant in an era where environmental policies and agendas can be easily overturned or ignored by the next political administration. Having citizens that support sustainable consumption without the need for external enticements may help to move affluent techno-industrial societies toward a new normal of using resources more responsibly. This is demonstrated by early adopters of green energy, who pursued home solar electricity out of intrinsic interest and enjoyment (Schelly 2014) and people who are experimenting with alternative economic structures in ecovillages and other intentional living arrangements (Schelly, this book).

One intrinsic satisfaction seemed particularly important to the consumption behaviors measured in this study. The spillover from physical and non-physical sharing behaviors to pro-environmental and pro-social behaviors, respectively, were both mediated by the satisfaction derived from meaningful action. This finding is consistent with that of Thøgersen and Ölander (2003), who showed that spillover among environmentally friendly behaviors was greater the more an individual aligned with values of universalism that, like meaningful action, centers on benefitting other people and the natural world—in other words, the capacity to think and care for life beyond the self. Kaplan and Kaplan (2009) also identify meaningful action as being a universal and fundamental human motivation and a necessary condition for fostering pro-environmental and pro-social behaviors.

While meaningful action is an important motivation, there may be situations when other intrinsic motives, at least initially, are equally important. In such a situation, the behavior-specific motivations of frugality and social satisfaction may serve as gateway motivations. Learning to identify an individual's specific motivational circumstance and discovering which intrinsic satisfaction to leverage is a challenge that deserves further attention, within both research and practice. Spillover effects are an elusive yet important notion in the field of conservation psychology. To have found them interacting with sharing behavior is a potentially useful tool; conservation psychology practitioners now have an evidence-based reason for focusing on sharing behavior. Not only is sharing behavior worthy of attention in its own right, it may also serve as a gateway to other pro-environmental actions.

Conclusion

The transition to less energy-intensive and more collaborative, equitable, and cooperative lifestyles may not be optional, but rather a necessary response to the biophysical constraints of our planet. The findings presented here identify an opportunity to create local initiatives for sustainable consumption that tap into intrinsic satisfactions and suggest that increasing engagement in one type of conservation behavior may lead one to pursue other pro-environmental and pro-social actions.

Empowering individuals to take control over their own actions is a strategy that is often overlooked within the scale of our global environmental crises, but the power of individual behavior change should not be underestimated. Individual behaviors collectively affect the planet we all share, and individual behavior change can lead to a more sustainable consumption of our planet's resources. However, in a world where so much is expected of individuals, we should also not lose sight of the importance of community support.

Engagement in any community-based sharing efforts, especially those that are voluntary, like reducing consumption within techno-industrial societies, is more likely to be successful if community members are adequately supported. Policy makers, architects, planners, and other community change agents can work to increase access to, information about, and enjoyment from local initiatives for community-based resource sharing. Leveraging the intrinsic motivations derived from frugality, social participation, and meaningful action may also increase the likelihood that people will continue to stay involved over time, thereby helping to foster a more equitable and resilient future.

List of Contributors

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CHAPTER SEVEN

PURSUING SUSTAINABLE CONSUMPTION THROUGH DIVERSE ALTERNATIVE ECONOMIES: A COMPARATIVE EXAMINATION OF TWO U.S. INTENTIONAL COMMUNITIES

CHELSEA SCHELLY

Abstract

When thinking about how to pursue sustainable consumption, many scholars explicitly recognize the need to change economic organization and activity. Whether through de-scaling, de-coupling, steady state, or plenitude economics, various bodies of work offer useful perspectives on the relationship between economics and sustainable consumption. This chapter works from the ground up, looking at two successful intentional communities in the United States. While both demonstrate potential futures for more sustainable models of consumption, these communities are organized based on radically different economic models. Twin Oaks is a labor and income sharing community, while Dancing Rabbit Ecovillage requires individual households to meet their own subsistence needs through economic activity. Based on ethnographic research, interviews, and participant observation, this chapter offers two reflections. First, the economic organization in each community seems to shape—although, importantly, not determinately—other institutional and cultural arrangements, from housing arrangements to social norms. Second, both communities are arguably successful and thriving, demonstrating the potential to pursue more sustainable consumption patterns through diverse forms of economic organization. This suggests, as these communities themselves acknowledge, that perhaps the most valuable tool for pursuing

sustainable consumption is to allow for flexible experimentation in alternative economic activities and the organization of residential life.

The environmental crisis as an economic crisis

The destructive impact of the globalized, fossil fuel based, capitalist economy on the environment is glaringly apparent. There is scientific consensus on the role of human activity in precipitating a changing climate (IPCC 2014). There is no doubt that the economic activity that humans organize and conduct is negatively impacting the planet, nor that the quality and quantity of available natural resources to sustain human life are both tangible concerns for supporting thriving human communities today and in the future. Human activity, including economic activity and the sociotechnical realities that support it, is inextricably linked with the natural world, and human economic activity under systems of capitalism involves destruction of the very resources upon which human lives depend. Despite claims from so-called eco-modernists about the potential to decouple human needs from nature (Asafu-Adjayeet al. 2015), it seems as if humans are as reliant on the natural world as ever, and the environmental impacts caused by the economic activities that support human society are creating profound impacts on the ability of human beings to live healthy, quality lives.

Many scholars have long recognized the role of economic activity in causing environmental degradation. Karl Marx and Max Weber, core authors in the classical foundations of the discipline of sociology both foresaw the consequentially damaging impacts of capitalism on the natural world. More recent scholars like John Bellamy Foster have carried Marx's ideas forward to the present, describing, for example, the rift in human-nature metabolisms (Foster 1999). Herman Daly wrote about the need to pursue what he called steady-state economics, economic activity without the presumptive need for infinite growth and expansion (Daly 1973; 1977). Others have called this natural capitalism and rallied around similar reformative options for addressing the environmental harms caused by capitalist modes of production (Hawken, Lovins, and Lovins 1999). Some calls for economic restructuring focus on the need for sacrifice (Maniates and Meyer 2010) or the need to live within the limits of sufficiency (Princen 2005), to curb consumption and buy less so that the environment is less damaged by the economic production activities that operate to satiate consumptive desires. More recently, Juliet Schor (2010) has called for a plenitude economy, in which people work less and spend less while producing and experiencing more. Jeremy Rifkin (2011) has called for a third industrial revolution where the technologies of the future allow for descaled production and move away from fossil fuel dominated energy economies. In various ways, these authors all share a concern regarding how to achieve quality of life for humans without the environmental damages currently associated with consumption, growth, and even the meeting of basic needs, currently organized and achieved through economies oriented to capitalist modes of production, accumulation and exchange.

Clear possibilities exist for changing human economies, changes that mitigate some of the disastrous environmental consequences already underway that are so clearly caused by dominant modes (treadmills, even) of productive and consumptive activities and exchange. Examining these possibilities via the case studies presented below reveals the complex relationships among economy, technology, and society as well as the real possibilities for transforming economic activity and organization in a multitude of ways. Optimism about these possibilities stems from the lived experience of those living in intentional communities in the United States, which I accessed via ethnographic fieldwork (Schelly 2017). This ethnographic fieldwork focused on the relationship between technologies (specifically alternative technologies like solar energy and hot water heating, community scale water provision and waste treatment, communal rather than private vehicle ownership, and natural building techniques, to name just a few) and the organization of social practice. In a variety of case study contexts, this research focuses on understanding articulations of motivation as expressed by the people who live in these unconventional communities as well as the constellations of social practices employed in these alternative spaces (see Schelly 2016; 2017).

Among these ethnographic case studies, two are particularly noteworthy for their alternative forms of economic organization. These two intentional communities in the United States have both been successful, maintaining membership for decades (one since 1997, one since 1969). Yet their economies are different, although some of their sharing systems, some elements of their motivating orientations, and some measures of their success are remarkably similar.

This chapter introduces these communities, specifically the elements of their alternative forms of economic organization, with the aim of reflecting on how different economic arrangements seem to offer means of creating social and technological change in terms of environmental impacts, social practice, and quality of life as divorced from consumptive acts. While the need for change to economic systems for the sake of the environment and humanity is clear, these cases provide real tangible examples of some of the possibilities for this change. These cases raise questions about the possibilities for a pluralist approach to economic alternatives that benefit both humans and the natural world. This reflection provides two central points of analysis. The first is that alternative forms of economic organization offer potential viable tools for shifting economies to be less environmentally catastrophic and provide a higher quality of life for more people, but they also involve shifts in social organization, interaction, and practice.

Economic activity can be conceptualized using a framework based on how others have studied and critiqued technology and technological organization (for just a few examples of this vast and diverse literature, see Mumford 1934; Heidegger 1977; Gieryn 2002). Technologies are material things and systems that help humans accomplish tasks, but technologies also importantly form and pose limitations on human activity, habit, and thought. Technologies allow certain human tasks to be done, but they also limit what can be done, what can be seen, and what can be thought about what is done and seen. Similarly, economic organization and activity operates to help humans facilitate the meeting of needs and comforts, but economies also act as material and conceptual boundaries on possibilities for change.

Conceptually placing economic systems in the realm of sociotechnological systems suggests bringing insight from science and technology studies to understand economic systems. This perspective of viewing economic arrangements as just another sociotechnical system sheds light on the co-constitutive relationship between economic and sociotechnical systems while also raising further questions: how do economies interface with sociotechnological realities and choices? What is the value of thinking through how variation in the organization of economic activity corresponds to variation in sociotechnological organization? Linking economy, technology and society reveals the value in adopting Emile Durkheim's idea of a social fact to describe the economy as something separate from society while simultaneously internalized and treated as real nonetheless. Examining how alternative forms of economic arrangement correspond to alternative forms of social organization, interaction, and practice illustrates the importance of considering how economic choices are indeed social choices and how possibilities for changing economies are also possibilities for changing societies.

Reflecting on the questions posed above calls into question how to best conceptualize the relationships among economic organization and other material, technological, and cultural elements of society. Understanding this co-constitution may require what Mary Douglas (1972) once described as "an ecological approach in which the structure of ideas and of society, the mode of gaining a livelihood and the domestic architecture are interpreted as a single interacting whole in which no one element can be said to determine the others." The analysis presented below illustrates this central point regarding how forms of economic organization correspond to forms of social organization, interaction, and practice.

Although the alternative forms of economic arrangements they employ differ markedly, both communities demonstrate the possibility for living a more socially fulfilling life (as described by community members) with a greatly lessened negative impact on the natural world. This, coupled with the community member's own observations that their communities represent an experiment with possible alternatives but certainly not the only option for social change, provides an opportunity to explore the possibility for a pluralist approach to alternative economies, meaning that multiple alternatives to the dominant economic form of capitalist neoliberalism may exist simultaneously and thrive conterminously. While there are many perspectives that bring attention to the need to radically alter economic organization and activity for the sake of the planet and the humans that inhabit it, this call for a pluralist approach to alternative economies perhaps represents a new shift in the conversation about how economists and publics alike talk about the possibility of embracing economic plurality as a means of pursuing more sustainable consumption patterns through diverse forms of economic organization.

The case studies

This chapter is based on ethnographic analysis in two intentional communities in the United States: Twin Oaks and Dancing Rabbit Ecovillage (see Schelly 2017). Twin Oaks (see www.twinoaks.org) is an intentional community with over 45 years of success as a radical alternative to mainstream dwelling, located on approximately 450 acres of land in rural Virginia. The community is comprised of an ever-evolving population of around 100 adult members and their children and is based on an egalitarian, labor sharing, and income sharing economy. Dancing Rabbit Ecovillage (see www.dancingrabbit.org) was founded in 1997, when a group of friends from California moved to the northeastern corner of Missouri in search of land on which to begin an intentional community. At Dancing Rabbit, members cannot own a personal vehicle, thus no one is involved in a daily commute for work. Yet unlike at Twin Oaks, members are responsible for their own livelihoods and for meeting all the necessities of life.

These two communities certainly have similarities. Both organize life based on radically less personal stuff and personal space than many Americans are used to having, and both eschew the consumerist values that typify American culture (see Schor 1998). Both involve levels of sharing,

sharing space and access to material resources and goods as well as sharing meals, time, connection, and friendship, that differ from the lives of many Americans. Yet the communities differ widely in the ways they organize the provision of subsistence and the meetings of needs and comforts. I describe each community in enough detail to provide insight into their alternative forms of economic organization, how their alternative economies intersect with other aspects of life in each community, and what their alternative economic practices offer in terms of viable solutions for pluralist economies.[1]

The economy at Twin Oaks

Twin Oaks is based on shared labor and shared income. Every adult member of the community is required to work the same number of hours per week (the weekly quota was 42 hours a week when I visited in the fall of 2011) and receives the same spending cash allowance each month ($86 a month at the time of my visit; this allowance is $103 as of April, 2016, demonstrating that the community has been much more successful keeping wage growth paced with inflation than the U.S. overall). The community includes several small businesses and makes tofu and hammocks as their main income generating ventures. Twin Oaks community members also produce over half of the food they eat, including all of their own meat, milk, yogurt, and cheese. Members live in seven community structures organized into nine small living groups (called SLGs). Some people may have only experienced this kind of living if they had lived in a Fraternity or Sorority house, where eight to eighteen people share community living spaces, having only a small bedroom (some smaller than others) as personal, private space. The community provides food, housing, medical and dental care, $50 for new shoes each year, approximately four weeks of vacation time each year, and a full wardrobe of clothing through their free for all consignment shop, "Commie Clothes." The community also provides various resource libraries for its members, including media libraries (books, music, movies), tool libraries, musical instruments, and exercise and recreational equipment.

The elaborate systems of sharing at Twin Oaks radically reduce the resource intensity of sustaining human life. The community claims that the carbon footprints of their members are about 20% that of the average American.[2] This unique community has made what one Twin Oaks member calls a "radical sharing economy" work for decades, and the alternative forms of material organization are based on the alternative forms of economic organization that serve as the foundation of the community.

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[1] Much of the empirical material in these following two sections on Twin Oaks and Dancing Rabbit Ecovillage is excerpted from Chelsea Schelly (2017), published by and reprinted with permission from Rutgers University Press.

[2] See https://funologist.org/2014/11/08/how-sustainable-is-twin-oaks/, accessed April 29, 2016.

At Twin Oaks, every member is required to work the same number of hours each week and receives the same access to provisions and resources in exchange for their labor. A member named Mira,[3] a mother of two young children who has lived at Twin Oaks for 11 years, told me that the shared labor system is "probably why we're still around after 44 years; we didn't spend five years arguing about who is going to do the dishes" (as long as they are physically able, every member has to do one shift of washing dishes a week, the only task required of every member). Another member told me that turning in your labor sheets and following the labor system is the "only active requirement" for living in the community.

The weekly work quota is measured in labor credit hours and includes time spent in income generating businesses like making hammocks or tofu or subsistence activities like feeding chickens, milking cows, or working in the garden. It also includes making meals for the community, cleaning public spaces including kitchens and bathrooms, doing the shopping for the community, or taking care of children. Community members can work over the weekly quota to accumulate extra hours in a labor savings account for extra vacation time. If you are ill, you can claim up to six hours a day of "sick hours" and your friend can claim "care hours" for bringing you meals or making you tea. Birthdays, the anniversary of your "join date," and several other holidays throughout the year are also "six hours creditable." To accommodate aging, weekly quota decreases by one hour every year after your 50th birthday.

The Twin Oaks labor system involves several decisions with both financial and cultural consequences that seem important to the community's success. First, the annual labor budget requires figuring out how to balance the multiple needs and resources of the community as they vary across time and with temporal rhythms throughout the year. Some work is seasonal and conflicts in seasonal work can arise; for example, most people buy hammocks in the summer, when work in the Twin Oaks garden is also at its peak, so hammock production goals are set in the winter to ensure that hammocks are available to meet summer sales demands while there is also a highly productive garden.

Second, the Twin Oaks community has had long-term financial success making hammocks. Recently, the tofu production business has become increasingly profitable, and the community has invested in it, both with substantial equipment purchases and by shifting labor hours and community priorities to recognize the importance of this newer income activity. A third important facet of labor organization involves leadership; while there are managers of specific organizational aspects of life at Twin Oaks, actual shifts that involve working with people do not include traditional bosses. "Honchos" are selected and indicated on each person's labor sheet, so everyone knows who is in charge while making dinner or packing tofu that day. "Honchos" change with each shift, meaning you may be "honcho" for the dinner shift one evening but work with a group in which someone else is "honcho" another night that week. People only serve as "honcho" if they enjoy the organizational or facilitator role in a particular job. People choose to "honcho" different tasks. So, the person who came to make dinner with an idea in mind and who already checked on all the ingredients and who asked someone to chop some carrots may, the next day, be asking that someone what needs to get done in the woodshop and checking in with them as they work. This "honcho" system allows people to serve as leaders only when and in tasks they desire, and only temporarily, with no differential reward. It reinforces the equality of community members while allowing them each to pursue their interests.

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[3] Pseudonyms used to protect the confidentiality of participants.

There are very few deviations from the commitment to equitable labor credit, where "an hour is an hour" and every hour counts equally. These deviations arguably serve the community well. For example, visitor labor does not come out of the annual labor budget, which determines how many hours will be dedicated to each aspect of the community over an annual cycle. With three-week visitor programs running concurrently almost every month of the year, Twin Oaks consistently boosts its productivity with the extra visitor hours.

The only deviation from the equal credit given to all labor is that childcare hours are the only form of labor given half credit, meaning an hour of childcare is only worth half an hour toward the weekly quota. Community members say this policy encourages childcare providers to take children to work with them, exposing them to new things and new skills, using the real world for education, and integrating children into the labor system. Children at Twin Oaks actually are integrated into the labor system, because they begin working for a very few number of hours each week at an early age, with their quota increasing gradually as they get older. This policy of allocating half credits for childcare also encourages people to take care of one another's children and get children socializing together. It also discourages people from being isolated in nuclear families when caring for children, corresponding to the community's values of integration and sharing resources.

More generally, the community uses the labor system to promote community values, like taking care of a sick neighbor or bringing the kids to help in the garden. One community value is self-provisioning, and their labor system reflects that. A man named Sam who's lived at Twin Oaks for 30 years called it "vertical integration" when he told me, "In our businesses as in our community, we want to do as much of it as we can." Another community member put it this way:

> We make lots of decisions you wouldn't make if you were running the organization like a business. For example, we have a huge organic garden. And we love the produce that comes from it, and we put a lot of hours into it. But if we were running it like a business, we'd close the garden down and we'd put everybody into the income areas.[4]

Through the labor credit system, the community encourages activities that promote self-provisioning.

The Twin Oaks economy, in many ways, successfully decouples work from income generation. In mainstream America, when people ask, "What do you do?," they mean, "What do you do to earn income?" At Twin Oaks, in contrast, people have the opportunity to explore what they like to do rather than focusing on what they need to do to earn enough money to survive. The community's labor system allows people to pursue their interests, fostering the development of well-rounded individuals with many skills and experiences. The labor system at Twin Oaks demonstrates a new allocation of time, recognizing that:

> …all activities, whether they are monetized or not, have the potential to yield returns. We recognize wages and salaries as the returns to employment. But activities that do not earn dollars create returns as well. Doing work in one's own household, without a wage, is production. The cooked meal, the completed tax return, and the cared-for child all have economic value. (Schor 2010, 101-102)

As one member told me,

> Some people think, 42 hours, that's more than a full-time job, but here, so much is included. Like, so much of just being productive in life that doesn't count as work when you're a salaried employee. And, there's no commuting!

Another member said,

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[4] Quoted in Community Catalyst Project (2004). Visions of Utopia: Experiments in Sustainable Culture.

> One of the keys to the good life is having a flexible work schedule, having a pleasant work environment. If the day is beautiful outside, people can take the afternoon off and go for a walk in the woods, everybody has 4 or 5 different types of work that they do or more. The work that they really enjoy.[5]

At Twin Oaks, work and life become flexibly intertwined. People can do things they enjoy, spend time with people they enjoy, while working for the good of the community in a multitude of ways.

The economy at Dancing Rabbit

For the founders of Dancing Rabbit Ecovillage, it was important to find a place where building codes and zoning regulations would not limit the kinds of experimental buildings and infrastructures they hoped to employ. There are no personal vehicles in the community and the physical layout is intentionally designed to create a walk-able, sociable village. Community members can and do live in individual homes, but there is a large common house with shared facilities for bathing, doing laundry, sharing a meal, using the Internet, playing piano, playing a board game, or just hanging out. Dancing Rabbit is not an income sharing community like Twin Oaks; members of Dancing Rabbit are responsible for their own income to support subsistence needs and comforts. Another way to put this is that, at Dancing Rabbit, labor is not de-commodified. Some scholars suggest that decommodification of labor is necessary for a truly sustainable sharing economy (see Schor 2010), but the longevity of Dancing Rabbit suggests that alternative forms of residential dwelling can be organized around diverse economic forms.

The community is active in thinking about and working toward forms of economic organization that are both socially and environmentally beneficial. The community houses a non-profit educational and outreach organization, The Center for Sustainable and Cooperative Culture, and some community members work for this organization.[6] The headquarters of the Fellowship for Intentional Community is located in the community, and a small number of community members work for this organization.[7] Many members of Dancing Rabbit talked to me about how they were able to spend more time working and volunteering for causes they care about because they need less money to support their ideal quality of life because they live in the community.

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[5] Quoted in Community Catalyst Project, *Visions of Utopia*.

[6] See http://www.dancingrabbit.org/about-dancing-rabbit-ecovillage/dancing-rabbit-inc-nonprofit/; http://www.dancingrabbit.org/introducing-the-center-for-sustainable-and-cooperative-culture-formerly-known-as-dr-inc/

[7] See http://www.ic.org.

In an internal economic survey conducted by the community in the spring of 2015 completed by 23 members[8] who had lived in the community for varying amounts of time,[9] respondents indicated that 32% work online or on the phone; 32% work in person for businesses or individuals outside the community; 77% work for the community; 59% work for business in the community; 18% rely on income from investments; 36% rely on family support/inheritance; 27% rely on government or nonprofit assistance; and 41% reported other income such as loans or IRA payments. Among respondents, 17% said their relationship to money was a lot more stressful than before they moved to the community, 17% said a little more stressful, 44% said they experienced the same amount of stress, 9% said a little less stress, and 13% said a lot less. The community is very conscious of the economic barriers to living at Dancing Rabbit (due to the community vehicle requirement, it is next to impossible for members to commute to work daily, the dominant model of income generation in America). As the community looks to become an economically viable and sustainable village, community members make money working for one another, working for the inn and café that is located in the community (well-known locally for weekly pizza nights),[10] selling eggs, cheese, meat, and produce, providing childcare, building homes, supplying firewood, and finding other ways to exchange goods and services to support one another's economic needs.

The community has established a (suggested, not required or enforced) minimum wage of $9.50 per hour. This was once used as a standard wage, treating all kinds of work as equally valuable, but the community decided to allow wage inequality in order to more highly value skilled labor and trades. One community member told me,

> Some members want to value all labor equally. I'm a fan of an expert labor work force. Do you want an experienced builder building you a house, or someone who's willing to work but has no experience? You'll end up paying for a lot more hours of labor and getting a lower quality house in the end. Not valuing our labor artificially deflates our economic system.

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[8] The survey was completed by 10 women and 13 men; age breakdown of respondents: 18-29 years old: 9%; 30-39: 48%; 40-49: 30%; 50-59: 5%; 60+: 9%.

[9] Less than 2 years: 22%; 2-5: 26%; 5-10: 22%; 10+: 30%.

[10] See http://www.milkweedmercantile.com.

Other members also talked about the need to build the community's own economy by paying one another for the work people exchange, including work on village committees.

The community also has its own alternative (they call it "complementary") currency system, ELMs (which stands for exchange local money). Members can pay one another and can pay their coop fees using ELMs. One member told me,

> I use ELMS almost entirely for all of my living expenses. Almost all of my income is in ELMs.... I pay for nearly everything with ELMs, including transportation, lease fees, my Mercantile[11] tab, all of my coops and utilities, etc.... There is no one here that won't accept ELMs for anything that I know of. It is also routinely used in transactions with folks from the other communities and even some locals who don't live in one of the official communities.[12]

This alternative currency system allows people to provide for much of their subsistence without needing to participate in the conventional moneyed economy.[13] Although the structure of economic organization at Dancing Rabbit is very different from that of Twin Oaks, both communities have developed systems of economic organization and exchange that allow people the freedom to engage in alternative practices when it comes to interactions with money. As one Dancing Rabbit member told me, "People get less attached to making money after living here. They get to explore how much they really need to be comfortable, instead of living like they always need more."

Comparing economies: A discussion

Twin Oaks and Dancing Rabbit have radically different economic structures, but members of both communities are living with a lessened impact on the natural world and a greater sense of social connection and fulfillment. One important point from comparing these case studies is the way that economic organization intersects with technological and infrastructural organization. Twin Oaks and Dancing Rabbit have different economic structures; they also rely on different sociotechnical arrangements for organizing daily life. Twin Oaks community members live together; most Dancing Rabbit members live in independent dwelling structures. Twin Oaks community members share two daily meals; Dancing Rabbit members may choose to join an eating cooperative to prepare and eat food in groups, or they choose to eat alone or in nuclear family units. At Twin Oaks, individual members never have to think about rent or a mortgage or utility bills. At Dancing Rabbit, members may choose to invest in independently generated renewable energy systems or may choose to connect to the community's local utility (called BEDR, Better Energy for Dancing Rabbit) and pay for the electricity they use. In each community, the emphases and forms of social interaction are also different, arguably related to the different forms of economic organization in each community.

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[11] Name of the restaurant/bar/store in the community.

[12] There are several other intentional and alternative communities very close to DR, including Sandhill Farm (see http://www.sandhillfarm.org) and Red Earth Farm (http://www.redearthfarm.org), both within walking distance.

[13] https://www.dancingrabbit.org/social-change/social-change/economy/local-currency/; see also http://matadornetwork.com/life/8-best-areas-united-states-alternative-lifestyles/.

As a way of contrasting the opportunities for change presented by Twin Oaks and Dancing Rabbit, which result from their alternative economic and sociotechnical arrangements, I offer the following thought experiment: what would it look like to transform a typical suburban residential neighborhood to look like Twin Oaks or Dancing Rabbit? Consider a suburban neighborhood of approximately 200 homes, of an average of 3,000 square feet. The neighborhood itself has sidewalks, but those sidewalks do not currently connect to anything beyond the community. Consider a typical home designed for a single nuclear family in this neighborhood, with 4 bathrooms, 4 bedrooms, and a large kitchen.

At Twin Oaks, this home would be organized as an SLG, with perhaps 5-8 people sharing the home. Many of the homes would also have some community space (the kitchen and living rooms would be public for all community members) and space for a shared income generating or recreational activity. Perhaps some houses would be converted to be primarily production spaces; at least one would likely have a larger community kitchen; many would likely have installed solar electricity and hot water. The community of residents would collectively pull funds from their collectively earned income and manage time sheets so that other community activities could also be collectively organized, like gardening (perhaps in dedicated neighborhood lots to centralize production), mowing (this is a suburban neighborhood after all), maintenance, meal preparation, cleaning, and the management of collective systems like labor schedules, car sharing schedules (for the community fleet of vehicles), finances, utilities, and planning. They would own the land collectively, look for ways to increase both incomes and community scale self-provisioning that correspond to the community's social and environmental values, and plan for one another's retirements.

If this neighborhood were organized like Dancing Rabbit, people would also likely share these monstrously large homes, although perhaps in smaller groups. They would also organize sustenance on a smaller scale, with either individual homes transforming their lawns to gardens and eating in their personal kitchens or perhaps with multi-household clusters gathering for meals. These large kitchens would be ideal for eating coops, with several families coming together to share in preparing and eating food, which would open up space in other homes for alternative uses of the kitchen space; perhaps members would organize small scale community gardens among clusters of homes, if members chose to self-organize. Income generation would continue to be an individual pursuit, although groups of people may choose to organize their efforts to start online businesses or non-profits or engage in larger scale income generating food production, perhaps including animal husbandry. Rather than owning personal vehicles or limiting use of each kitchen or washer to a single nuclear family, each person or household unit would be responsible for paying dues for participation in cooperative sharing systems but the cost of accessing these resources would be less than the cost of individual ownership for things like shared cars, kitchens, and laundry facilities. The community would have collective space dedicated to the composting of organic waste, and households would be equipped with waterless composting toilets. Most homes would have rainwater catchment, solar electricity and solar thermal hot water systems, and the community would be actively discussing ways to reduce fossil fuel usage.

This thought experiment is meant to demonstrate how the alternative economies in these two communities shape alternative forms of organization in residential life. When communities share income, manage community businesses, and share community resources, physical space must be dedicated to these activities and to shared efforts at community scale self-provisioning and subsistence. In either case, through community scale labor and income sharing or through individualized subsistence organized with community mindfulness, radical restructuring can arguably take place within the existing sociotechnical conditions of the built environment.

There are two primary commonalities highlighted by this thought experiment, which are worth explicit attention. First, both communities, despite differences in economic arrangements, involve an increase in the number of shared systems. As one member of Twin Oaks told me, “In the United States, 95% of people’s shit sits idle 95% of the time. But here, we choose to share.” Sharing systems, especially for materially and economically intensive resources, makes sense in a multitude of economies. However, in both communities, the transaction costs involved in managing these sharing systems are taken into consideration and accounted for in community economics. Through labor credit for systems management (at Twin Oaks) or through fees paid for participating in the car sharing, eating co-ops, or the common house laundry and bathing facilities (at Dancing Rabbit), these communities highlight the importance of recognizing and providing resources for management of common, shared resource systems.

A second point is the important role of local policy for shaping the possibilities for pluralist economies. Both cases involve a blending of work and home life, which is often difficult given current zoning and coding laws. Both cases involve more localized and community-controlled systems of managing water and organic waste, also often prohibited by local policies. Policies, including state, county and local zoning and coding requirements, formal and informal community policies, and of course the regulations shaping banking, loans, and insurance based on presupposed modes of private ownership, largely work to prevent pursuit of alternative economic arrangements (Moore and Wilson 2014). The point is not (necessarily) that all these rules need be eradicated, but that existing policies deserve close consideration and scrutinization and intentional questioning of how they might unnecessarily limit transformation of economic activities in ways that promote both social connection and environmental stewardship.

Pragmatist, pluralist economies?: Concluding thoughts

People living at both Twin Oaks and Dancing Rabbit talked about the value of living within a group that pays "careful attention to multiple sources of wealth" (Schor 2010, 3). They also talked about the importance of learning new skills that contribute to their own subsistence and the community's wellbeing through firsthand, bodily experience rather than formal training; in this way, members of both communities have opportunities to find the craftsperson within themselves (Sennet 2008; see Schelly 2017). Further, in both communities, members recognize that "human actions are inescapably entwined with a larger web of life forms (human and nonhuman), natural formations, technologies, and built environments" (Meyer 2015, 47). These communities provide living examples of the possibilities for economic transformation that is environmentally, socially, and personally worthwhile.

Based on ethnographic research, interviews, and participant observation, analysis of these two case studies offers at least two points of reflection. First, economic organization at both Twin Oaks and Dancing Rabbit seems to shape other institutional and cultural arrangements, from housing arrangements to social norms. Forms of economic organization are inevitably intertwined with material and social organization as well as social interaction. These case studies suggest a real tangible need for thinking about what works in economic organization, and how the material systems that support economic exchange—-from the built environment to the landscape of lending and insuring—work to shape conditions for possibility in alternative economies. Transforming the economy may require explicit attention to the kinds of social transformation that are either desirable or acceptable.

Second, both communities arguably demonstrate the real possibility of pursuing more sustainable consumption patterns through diverse forms of economic organization. This suggests, as these communities themselves acknowledge, that perhaps the most valuable tool for environmental sustainability is to allow for flexible experimentation in alternative forms of organizing residential life. There are of course many examples of alternative exchange, from Craigslist to Uber, many facilitated by a hyper connectivity in the era of smart technology; perhaps there are possibilities for reorienting these sharing systems to a community scale, with intention.

These cases also demonstrate the real possibility for and potential value of a pluralist approach to economics (Schlosberg 2008), with multiple alternatives in how economic exchange is configured to meet human needs and comforts in ways that benefit both social connections and the natural world. There is real value in rethinking money as simply a way to meet human needs, seeing money as a social fact rather than an inevitably valued good in itself, as ultimately and in the last instance always tied to the natural world, and just one tool among many. There also appears to be possibility, albeit seemingly tenuous, for compassionate capitalism, when exchange is organized on a community scale and with shared community values in mind. Examining these two successful communities as examples of the possibilities for economic transformation provides evidence of the possibility for pluralist forms of economic organization in creating conditions for new possibilities.

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CHAPTER EIGHT

THE PRODUCTION AND CONSUMPTION OF CULTURE IN BRAZILIAN FAVELAS AND CITY OUTSKIRTS: CAN CULTURAL ACTIVITIES BE CONSIDERED AS ETHICAL/SUSTAINABLE PRODUCTION AND CONSUMPTION?

RITA AFONSO, CRISTINE CARVALHO
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Abstract

In Brazil, cultural, artistic and communication activities in favelas and city outskirts are common despite being neglected by government and public policies. The objective of this chapter is to offer a reflection on how these activities can be approached and placed within the context of ethical/sustainable production and consumption and provide signs of improvement in the living conditions of communities.

Through participant observation and interviews in the context of three cases of cultural production and consumption in favelas and surrounds, we evaluate these cases with broad concepts of sustainability according to Sachs (1983), Sen (2000) and UNESCO (2013), who also use territorial, cultural and political perspectives in addition to the traditional economic, social and environmental pillars.

In what results, we find a strong bond between the activities and the territorial, cultural and political aspects of sustainability, such as the way they emerged as a response to problems faced locally, including persistent social problems and the limitations imposed by their territorial context. The cases show the importance of debate concerning local issues in order to valorize the local culture and art in the improvement of living conditions,

providing bottom-up patterns. These patterns may establish sustainable lifestyles and an ethical way to produce and consume, when viewed in their own contexts.

Introduction

In this chapter, we define sustainability as a collaborative way of thinking developed as a network of forces provided by local capital in relationship with global economic and cultural systems. The origins of this term come as a result of high population growth and the environmental impact of industrial production, which also excessively extracts natural resources. Although economic and environmental concern has evolved during the more recent years of developmental processes, how should the local/global challenges of sustainability be addressed? How can a healthy and progressive humanity be supported under a global capitalist system, especially in a developing country where part of the population is still deprived of access to basic human rights?

The research undergirding this chapter emerged from a desire to explore and identify the existing social innovations in the favelas and outskirts of Rio de Janeiro. However, along the way, we realized that we were also dealing with cases of sustainable production and consumption in the general field of culture. Subsequently, we conducted a literature review to explore the proposition that these cases might be examples of sustainable production and consumption within their contexts. Also, we are not highly detailed with these cases, but highlight particular information to subsidize the proposition using material already collected for our research on social innovations. Consequently, we believe that what we propose here is a new look at these activities.

Residents of favelas and urban outskirts are deprived of a range of rights (access to water, housing, security, education, health and information), though in terms of consumption, they acquire many middle-class type products such as TVs, cell phones and computers. The deprivation experienced in the favelas is associated with a lack of urban infrastructure and key public services, extending to a lack of business interest and appeal to consumers. Nevertheless, favelas in Rio are densely populated and house 22% of the city's population. These deprivations can also be held in strong contrast to the reality that is seen inside the favelas considering people’s potential to create solutions with the resources that are available, especially in cultural terms.

Until 1998, the cultural dimension of sustainability generally played a secondary role in relation to other sustainability dimensions economic, social and environmental. In 1998, the UNESCO's action plan, "The Power of Culture," and the later UN-Decade 2005-2014, "Education for Sustainable Development," drew greater attention to the sphere of culture in development discourse.

In the Brazilian reality, new practices, discourses and material expressions of capabilities and habits are being produced and consumed in favelas. These developments reveal some of the uniqueness of the context that empowers an understanding of culture as an important component of community development. When looking closer, social ties, heritage and cultural assets can be viewed as the main resources to promote local identity and political engagement, which can lead to local community development.

Cultural community initiatives in Rio de Janeiro's favelas reveal new ways of sustainable production and consumption when confronted with broader sustainability concepts, based on Sachs (1983), Sen (2000) and UNESCO (2013). In these concepts, the territorial, cultural and political aspects besides the economic, social and environmental pillars are considered.

This study started from three cases that stood out among the 32 cases mapped in the favelas and outskirts of Rio de Janeiro during 2014 and 2015. As investigators, we used a number of qualitative data collection methods: (1) content analyses, (2) participant observation, (3) semi-structured interviews with case study leaders and participants, and (4) monitoring social network activities, especially on Facebook.

The direction of our analysis is led by the following question: Can cultural activities—studied as social innovations in favelas—be considered as sustainable production and consumption?[1]

Following a case study approach, we describe three cultural activities that occur in three different favelas and urban outskirts in Rio de Janeiro which can be considered as sustainable production and consumption, if framed in a broader conceptualization of sustainability.

In what follows, we first (2) propose broader sustainability concepts according to Sachs (1983), Sen (2000) and UNESCO (2013), who consider territorial, cultural and political perspectives besides the traditional economic, social and environmental pillars; we (3) present the cases of communitarian initiatives placed in Rio de Janeiro's favelas; we (4) analize and discuss our results in relation to concepts in sustainability; and finally, we (5), conclude with selected highlights from the discussion with respect to sustainable ways of producing and consuming in the contexts of these peripheral urban areas.

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[1] As an anthropologist, Tylor (1974 apud James et al. 2015, 53) defines culture as "that complex whole which includes knowledge, belief, art, morals, law, custom and any other capabilities and habits acquired by man as a member of society." And in a contemporary variant, "culture is defined as a social domain that emphasizes the practices, discourses and material expressions, which, over time, express the continuities and discontinuities of social meaning of a life held in common" (ibid.). Cajaíba-Santana (2014, 43) defines social innovation as a driver of social change and a transformative "force through the inter relationship between agents, institutional structures, and social systems" (ibid.).

Sustainability theories in territorial contexts

The hypotheses of this research are (1) new cultural activities can emerge as a response to life conditions in areas where certain groups feel disenfranchised; (2) on the ties of friendship and loyalty - or local social networks - favela residents will build networks that strengthen relationships giving rise to collaborative services created within these communities; (3) residents are affected by global trends, such as ICT (Information and Communications Technology), but technology usage does not replace face-to-face articulation.

Lomnitz (2009, 20) identified the central role of social networks in urban studies during the 1970s, when she saw the life strategies of peripheral residents as a result of irregular industrial expansion:

> ... the organization of society in increasingly complex and regulated social structures is achieved at a considerable cost of marginalization (or exclusion) from certain sectors or extracts of society.

The center of these strategies, according Lomnitz (2009), is located in social networks built on the principle of reciprocity and horizontal bonds, as a field of relations between individuals. In her perception, each person or institution is the center of a network of solidarity that is part of other networks. The solidarity of these networks implies a system of exchange of goods, services or information and is done with sociability. The importance of reciprocity in this informal social economy is its presupposition of a psychosocial closeness between the members, which is manifested in the form of trust.

Manzini (2010) asserts that the focus on fostering a large and systemic process of change towards sustainability led to different theories and experiments. These enabled analyses of how grassroots innovations or small scale initiatives empowered by design could foster larger changes while keeping the knowledge, values and power at a local level. The SLOC scenario—Small, Local, Open and Connected—was proposed on the grounds that the "global is a network of locals," i.e. "a mesh of connected local systems, the small scale of which makes them comprehensible and controllable by individuals and communities," making them more effective (Manzini 2010, 8).

In the Brazilian context, sustainability is understood as more of a movement than a definition (Herculano 2002; Irving 2014; Porto 2005; Saisse 2014), it is a way of acting; new dynamics and ways of life integrated by the ecological, social, ethnic, and political spheres.[2] From the academic perspective, it implies the reorganization of the ways knowledge is generated, on the assumption of interdisciplinarity and with the potential to become a privileged field of social reflections and transformations (Becker et al. 1997).

It is a polysemic concept—having multiple interpretations—appropriate for diverse fields of knowledge production, and also for actions relating to specific interests, which have been pointed out by Morin & Kern (2005). The concept can be the trigger of a disregard for environmental rules and an ongoing civilization crisis. Still, according to Morin (2005), society's demands pose a general challenge to many organizations, especially educational institutions. These organizations and institutions are now engaging in a new scientific model that considers the totality, the network, the interrelationships, the uncertainties, subjectivities and emotions related to sustainability.

Originating from earlier ideas about sustainable forest management and twentieth century environmental concerns, Ignacy Sachs (1983) guided the concept of eco-development in which development planning must consider six dimensions: Social—autonomy of people and populations, based on the satisfaction of their basic needs (material and immaterial) and the social equality of conditions; Environmental—awareness about the use, preservation and protection of ecosystem resources; Economic—more efficient allocation and management of resources; Ecological—capacity of the planet, the resource potential of various ecosystems, and the assurance of minimum damage to natural life support systems; Spatial/Territorial—balanced urban and rural configurations, overcoming interregional disparities; Cultural—balance between tradition and innovation, integrated, self-defined and open national projects; Political (National)—universal appropriation of human rights and social cohesion; and Political (International)—war prevention, international cooperation.

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[2] Concerning our reference to "ethnic", it is commonly understood by Brazilian scholars (those cited) that poor people of color black, brown, indigenous though a majority of Brazil, are often overlooked in sustainability initiatives and general discourse. By inclusion of *ethnic*, we therefore land a critique against a myopic sustainability discourse directed by, and for, peoples of privilege. In other words, "sustainability" assumes a voluntarism and capacity to choose to change one's life that is not available to marginalized peoples who may actually be living more sustainable lives. In turn, there may be many things that affluent peoples can learn from the creativity demanded by the poverty and marginalization of those living "without choice."

The Sachs model (1983) originated from a systemic and integrated view of economy and emphasized the importance of local characteristics and appropriate technologies to achieve equity and social justice. According to Sachs (1983), it allowed the compatibility of economic, social and ecological aspects, as well as established specific proposals for different situations. In this way, he proposed that socio-economic change must have endogenous roots to ensure its sustainability. Populations must identify with and participate in the sustainability transformation in accordance with their consumption patterns. This is extremely important for the generation and implementation of public policies. In particular, the developmental potential of a country depends on its population's cultural ability to think and engage endogenously in its desired future (Sachs 2001).

The idea of local development is associated with the transition to a territorial and informational approach of sustainability. Based on Sachs, Vecchiatti (2004, 93) affirms that it is:

> ...linked to the perception, knowledge and awareness that society has its history, its present situation and its future direction. Such a state of collective consciousness requires that individuals see their responsibilities for making part of a larger set of actions, as in case of local development proposals. Ideally, this capacity drives the generation of public policies in different areas of development.

In this way, local development fully incorporates the territorial approach to development, with a characterization from a cultural identity.

Amartya Sen (2000) argues that culture, as a constitutive part of development and historical identity, can be instrumental in the increase of tolerance and the celebration of diversity. Culture influences the identification of a community purpose and the recognition of plausible and acceptable means to achieve those ends.

Civic engagement is influenced by cultural conditions and, in addition to economic participation, even social solidarity and mutual support can be influenced by culture. Such an integrated approach to development will only be achieved when the values promoted by a particular culture of sustainability are explicit and operationalized. According to Sen (2004, 1),

> The real issue (about culture), rather, is how - not whether - culture matters. That is, what are the different ways in which culture may influence

> development? How can the influences be better understood, and how might they modify or alter the development policies that seem appropriate?

Amartya Sen's contribution to the debate on sustainable development is similar to the perspective of human development and freedom used by the UNDP Report (2001, 9):

> Human development is about much more than the rise or fall of national incomes. It is about creating an environment in which people can develop their full potential and lead productive, creative lives in accord with their needs and interests. People are the real wealth of nations. Development is thus about expanding the choices people have to lead lives that they value. … Fundamental to enlarging these choices is building human capabilities, the most basic capabilities for human development are to lead long and healthy lives, to be knowledgeable, to have access to the resources needed for a decent standard of living and to be able to participate in the life of the community.

According to Sen (2001), freedom is accompanied by constant active participation in a social life without inhibitions, and without deprivation of the basic conditions of existence, going beyond simply free political choices. Furthermore, part of instrumental freedom is the guarantee of transparency, where security and trust between individuals is assumed. Amartya Sen believes that individual freedom should be considered as a social commitment. He also points out that such a guarantee relies on residents having the ability to express their values, to be self-reliant, to satisfy basic human needs and to have a greater participation and accountability in their community (Sen 2000).

Similarly, UNESCO considers that cultural diversity creates a rich and varied world that increases the range of opportunities and nourishes human capabilities and values, constituting one of the main drivers of the sustainable development of communities, peoples and nations. A variety of statements from UNESCO informing the political, cultural and territorial dimensions of development have led to international public debates on the theme.[3]

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[3] In 1982, UNESCO described culture as composed of "all the specific features, spiritual, material, intellectual or affective, that characterize a society or human group. Culture includes, besides art and literature, way of life, basic human rights, system of value, tradition and religions." This point is argued mainly in the seminal work, *The Fourth Pillar of Sustainability*, as well as later initiatives. Rana and Piracha (2007) reference the 1982 decision of UNESCO to launch the *World Decade for Cultural Development (1988-97)* and the 1995 report *Our Creative Diversity* as

Since the UN Conference in Rio in 2014, culture has taken a strategic role in sustainable development discussion besides environmental and economic dimensions.[4] UNESCO (2013a) has recognized culture as an important key to sustainable development due to the association of intrinsic values such as creativity, heritage and knowledge with the diversity in economic, social and environmental impacts of production and consumption.

According to UNESCO (2013a), culture can boost the economic dimension generating income and employment, impacting entrepreneurship, bringing creativity and innovation to the economy and social networks: it is the accelerator of resilience, it gives tools to fight against poverty, it facilitates participation of citizens, intercultural dialogue and equality of rights. UNESCO (2013b) highlighted culture as fundamental to ensuring inclusive and cohesive societies as it strengthens identities and creates a sense of rootedness and belonging, in particular for minorities.[5] In its Post-2015 Development Agenda UNESCO (2014, 4), the organization argues that:

> The promotion and integration of cultural values in the development of social policies is crucial to ensure the integration of marginalized and vulnerable groups, women, youth, people in rural areas, indigenous communities, people with disabilities and ethnic minorities and to tackle discrimination and inequalities, as well as violence and social exclusion.

According to UNESCO's consultants Duxbury & Gillette (2010), the elements of our habitus (Berkes 1998) and identity and ethnic allegiances (Rana and Piracha 2007, 21) place culture as "the glue that binds together all other concerns" and:

> …culture provides the building blocks of identity and ethnic allegiances and molds attitudes to work. It underlies political and economic behavior. Most importantly, it builds the values that can drive collective action into a sustainable future in the new global context.

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foundational developments. In 1998, the World Bank joined UNESCO in promoting culture in sustainable development (World Bank/UNESCO 1998 1999).

[4] The event highlighted the importance of cultural diversity and the need for a more holistic and integrated approach to sustainable development.

[5] According to the UN definition, a "cohesive society is one where all groups have a sense of belonging, participation, recognition and legitimacy." Available in http://www.un.org/esa/socdev/sib/inclusive_society/social%20cohesion.html, accessed in January 2017.

Culture can embrace the environmental dimension because it reflects the identities within it and can reciprocally raise awareness on ecological responsibility. According to the UNESCO (2014, 3) agenda:

> The integration of cultural aspects in environmental development enables an inclusive approach to the communities attached to the territories. In addition, cultural identities and local knowledge and practices offer an alternative view and relationship to nature and the environment.

It is recognized that the cultural dimension defines territory because it cultivates identities and shapes the space accordingly; additionally, culture influences political views by creating social cohesion and human rights appropriation (UNESCO, 2013a). UNESCO had included a goal explicitly focused on culture, orienting the promotion of cultural programs that foster creativity and artistic expression. Such programs could build from experiences of the past that promote democracy and freedom of expression, as well as address gender issues, discrimination, and the traumas resulting from violence.

Production and consumption of culture in the favelas of Rio de Janeiro

The economic crisis of 2015 negatively impacted the income of Brazilians and for the first time since 2010, the country lost rank in its United Nations' (UN) level of Human Development. Brazil went from 74th to 75th in a list of 188 nations that are classified based on three indicators: health, education and income. The expansion of access to health and education in the last decade in Brazil (2005-2015) due to social programs such as "Bolsa Família" has improved, although it was not enough to guarantee the socio-economic stability of the program. With the compulsory vaccination and enrolment of children in public schools in order to receive the benefit, the program has raised the quality of health and education of the Brazilian population, even in favelas and the absence of urban infrastructure (which is the theme of another public program, called PAC - Growth Acceleration Program). In the case of the city of Rio de Janeiro, its 763 favelas are the targets of these programs, where 22% of the population of Rio de Janeiro live (IPP 2014). Due to the geographical and constructional difficulties of favelas, schools and health centers were and are still located in the central areas of the city, places of great economic power, regular job opportunities and highly concentrated cultural activities (IPP 2014).

With health and education guaranteed, the residents of favelas still have difficulty with accessing the transport infrastructure and the cost of tickets to cultural events and even work in the city center. Over time, efforts are being made to improve the quality of local life in the favelas, including free wireless internet, technical training courses, social assistance projects, and artistic activities.[6]

From 2005 to 2015, the emergent middle-class population has doubled in Brazilian favelas; consequently, the consumer market has increased as well. According to research conducted by Meirelles and Athayde (2014) and Data Popular (2013) in different favelas in Rio, there is an intense craving for hi-tech electronic products, such as mobile phones, tablets and notebooks. 47% of favela residents already have LED, LCD, or plasma TVs at home, and 28% pay for TV channels, which reflects the great interest of residents in devices that allow access to the media, digital culture, etc. Residents have internet access by purchasing private plans for their houses, offices and cell phones, in addition to free access from a government program (Villela 2013). The people living in favelas also have a greater desire for opportunities and development in their neighborhoods. Governmental social projects were created in order to meet this demand, but were not able to accomplish it.

In Rio de Janeiro, residents of favelas and surrounding areas are discussing local development and designing service tools to communicate inside and outside these territories. Associated with artistic, communication and cultural experiences, these tools are produced and consumed by locals. Examples are seen in three project cases in organizations led by communities in the North Zone of Rio de Janeiro.

(1) “Entrou por uma Porta” (Entered through a Door)[7] is a community theatre project by the residents of favela Asa Branca, located in the peripheral North Zone of Rio de Janeiro. The project was founded in 1980 as an alternative for children and youth who were spending a lot of time on the streets after school. Nowadays the project offers artistic and participatory activities such as acting, dancing and photography, valuing the community's history and debating social issues experienced by young

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[6] Technical and social projects come not only from the government but also from corporate sponsorship (through tax incentives), corporate social responsibility programs and volunteer programs, mostly conducted by NGOs.

[7] According to Reinaldo Sant´ana, founder of the group: "My group is called Entrou por Uma Porta, because we are from a moment where we fought for civil rights in the arts. In these struggles we could meet, but there were also conflicts between us, always. Of our historical foundation we realized that we were a junction of four or five different groups and whoever else entered through the door. From that came the name Entrou por uma porta” (Reinaldo Sant´ana, Personal communication, June 15, 2018).

participants: “in the community, for the community, with the community." From the participatory methodology, the entire creation process of these theatre plays are based on "learning by doing.” The plays are written, produced and directed by the young people. At the end of a performance, they engage in discussions with the public, which is when problems arise and solutions are found on issues related to public policy and local sustainable development. The project participants use social media (Blogs, Facebook, Twitter) to promote their activities and to chat (Facebook, WhatsApp) about the play and production. Via the Internet they keep connected with a community theatre network across Latin America.

(2) “Papo Reto” (Straight Talk) is a network of independent communicators. They live in Rio's two biggest complexes of adjacent favelas, the Complex do Alemão and Penha. Their declared goal is to spread news about events, protests and violence, acting as a channel of critical communication about the favelas’ reality from the residents’ point of view. They call for critical reflection on “the extent to which what mainstream media reports the truth.” Papo Reto’s motto is “nós por nós” (us for us), positioning themselves as an alternative perspective to the dominant media and establishing new patterns of relationship among residents based on trust and loyalty. The collective makes use of web-based communication tools, finding strong resonance within favela residents by providing them with an effective security system against everyday violence. They administrate a ‘WhatsApp’ group with about 200 participants, composed of residents, traders and motorcycle-taxi drivers, sharing real time information about conflicts in the favela. Papo Reto also has a Facebook page and a Twitter profile where, besides their WhatsApp services, they podcast news about events and other topics, often accompanied by criticism of the priorities and practices of police activities.

(3) “Norte Comum” (North Common Collective) is a network of 2,000 cultural producers. They live in the poorer parts of the city, yet engage in high-quality cultural production in their own territories.[8] They create local alternatives outside Rio's mainstream cultural circuit, which is concentrated in the Central-South zones. Despite the "North" in their name, North Common Collective is not confined to the northern part of the city. It also has many other areas (including the densely populated West Zone and other municipalities within the metropolitan region of Rio de Janeiro). North Common Collective emerged in 2011 from discussions in informal groups

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[8] The group produces shows, poetry, plastic arts exhibitions, artistic occupations of abandoned public buildings, etc. When the group began to act, they were focused on the North Zone of the city of Rio de Janeiro (the poorest part of the city). Nowadays activities continue to occur in the North Zone, however, the public that frequents the activities mixes Zona Norte and Zona Sul (the richest part of Rio).

and Internet communities. These young cultural producers are rooted in territories with low cultural funding and facilities and explain their creation due to lack of channels for cultural expression in the region: "There is a lot of cultural production, but to express it and consume it we would have to go to the Central-South zones. Why, if other zones of the city are just as culturally rich?" They aim to articulate, in the North Zone, cultural production sites and networks, enabling mobility with cycles of production and cultural expression in the neighbourhoods. The group has a collective house where many smaller-scale activities take place. However, they continue to hold larger events in the streets.

Lessons Learned

In terms of production and consumption in a broader sense, inhabitants of favelas and peripheral communities feel disadvantages associated with the lack of local urban infrastructure, safety and access to health, education and culture, conditions for human development. However, despite the ongoing need, solutions have been found to promote some opportunities to the population, as seen in the cases of these three initiatives conducted by residents of these communities.

The “Entrou por uma porta” was driven by a demand for local cultural events that addressed everyday life in favelas and the political issues in their context. According to the leader, children and youth from favelas miss school and spend the day at home or on the streets while their parents work in more than one job.[9] The community, besides lacking activities for children and young people, also lacks culture and political debate. Therefore, the group holds the theatrical presentations on political issues, and in this way, discusses with local residents the political scene at various levels of government.

As seen in the “Norte Comum” initiative, they feel like they are outsiders from the mainstream cultural circuit. In these circuits, the language and aesthetics used is very distant from their practices, traditions and the way of life in the favelas and outskirts, reinforcing the necessity to build their own art, media and communication practices, based on local traditions and culture.

With access to information technology and global media, the favelas' inhabitants began to use technology as a tool to promote activities. The primary motivation of the "Papo Reto" activity is the lack of security in the neighborhood (due to the war between the militia and police against the drug trafficking gangs), so the WhatsApp group emerged as a territorial solution. This solution provides information for the residents and workers to enter and leave the favela in safety.

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[9] In the Brazilian favelas it is common (although illegal) for children to be left alone at home while their parents work. This causes many to miss school. It is a requirement of this type of project that children do not miss formal school classes.

In "Entrou por uma porta" the theatrical creations are collaborative. A network of families of young people, friends and project supporters, set up the entire show. Resident-owned supplies are borrowed to build sets, props and costumes. Theme, text and staging are decided together. Presentations are free and open to the neighbourhood.

Concerning origins, the "Norte Comum" initiative was born of a group of friends and has also become a network for new friendships. This network expanded from the North by attracting other like-minded youth. Today, the house they occupy belongs to a member's uncle and young people across the network organize all activities. They work together but also go out together, have fun together and occupy the group house collectively.

"Papo Reto" was also founded by a group of friends. These friends lived in nearby streets in the same favela, and from their conversations about the shared feeling of insecurity, they thought of a solution that included motorcycle taxis and local traders.

In relation to the use of ICT, each group uses it differently and with varying levels of involvement. In "Entrou por uma porta" the relationship with technology is almost exclusively for the dissemination of group activities through a website. "Norte Comum" arose from online group discussion which they now use for research and dissemination of their activities, but the activities themselves are essentially face-to-face. In "Papo Reto," activities already occur through WhatsApp, Facebook and their website. However, the core group, those who originated the idea, meet face-to-face to plan, evaluate and articulate activities.

The cases studied had all been designed in response to the problems face locally, including the persistence of social problems and the limitations imposed by their territorial context. Their work is moved by benevolent affection towards their members and between them and other neighborhoods. The interests of these projects emerge from its member interactions, exchanges, and face to face meetings

Another extremely interesting issue that emerges, from analyzing the activities of these groups, is that their motivation is not primarily financial, but the reaffirmation of peripheral identities. They are interested in generating greater civic engagement within their territories and in creating their own strategies and policies of operation. In all activities, the importance of debate on local issues is evident and almost the primary reason for the existence of the groups. Besides this, the valorization of a local culture and the quality of everyday living conditions also appear as strong issues of resistance to the system. In other words, the relationship between activities and the territorial, cultural and political aspects of sustainability are evident.

As observed by Sen (2004), in the cases studied, cultural issues (in a broad sense) are an integral part of everyday life and can be considered necessary to local development, as an enhancement of living standards. Within the evolution of these cases the participants may be creating their own vision of systemic and integrated development, which considers and affects their social contexts, as they are also imbedded in the territorial contexts. That is, the relationship between the cases and space considers social, environmental, economic, ecological, political and ultimately cultural dimension, as defined by Sachs (1983).

Despite not having a financial gain as a main objective, "Entrou por uma Porta" has been enabled by income-generating activity and has been sponsored by private companies; the youth of "Norte Comum" are expressing themselves through the production of events, often financed by organizations and companies; whereas "Papo Reto" is more removed from the possibilities of financing and is more concerned with political action. However, the latter group has a lot of visibility in Rio de Janeiro, which generates other forms of remuneration, such as invitations to lectures at various seminars involving universities and public authorities. This is aligned with UNESCO (2013), which stated that culture can bring creativity and innovation to the local economy and can be an accelerator of resilience and rootedness, giving visibility to peripheral identities.

It is possible that these identities can become visible beyond the participants themselves and that in feedback fashion they reaffirm their own selves and declare the importance of local traditions and cultures, highlighting the social and ecological responsibility of the participants and other residents in the favelas.

Conclusion

This analysis offers a reflection on how cultural activities can be approached and placed within the field of ethical/sustainable production and consumption and provides signs of improvement in the living conditions of peripheral communities.

The valorization of individual capabilities and local contexts in a globalized market environment requires reflection on the importance of the resultant capital from these social and cultural networks. As an accelerator of resilience and rootedness, these local activities encourage the participation of members in decision-making processes and strengthen social ties locally between neighborhoods. As a consequence, common interest groups and entrepreneurs are formed, towns and movements flourish from the promotion of individual freedoms. The result is a strong bond between the territorial, cultural and political aspects of sustainability, in relation to the way the groups were created, in response to local problems, with respect to their persistence and limitations of territorial context. By expressing identities and raising awareness on ecological responsibility in the political sphere, these projects play an important role in creating change and promoting co-responsibility in their particular environs. They bring intrinsic values such as creativity, heritage, knowledge and diversity, and encourage their own strategies and policies of operation.

To observe and to categorize these cases and their evolution gives interesting clues to more sustainable ways of living and highlights movements that can grow and are deserving of public policy development and expansion, and a recognition of the plurality of practices created in the city. These movements also reveal areas for further research in cultural promotion projects as modes of ethical and sustainable production and consumption.

Perhaps, cultural production as a vector for societal change is more important, to the people producing it, than income generation. Also, it raises an important debate about material production and immaterial production from the perspective of sustainability. In the contemporary context, cultural production may have a stronger impact on the redesign of the ways of living than material production. However, we do not mean to dichotomize these two domains material versus cultural production: we see these dimensions as intertwined.

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CHAPTER NINE

ENTREPRENEURS IN SUSTAINABLE CONSUMPTION: THE FURNITURE TRUST CASE

VESELA VELEVA AND GAVIN BODKIN

Abstract

With climate change accelerating and waste disposal restrictions growing globally, it is becoming even more critical to advance innovative strategies for product reuse and waste repurposing. This chapter demonstrates that environmental entrepreneurs are well positioned to promote sustainable consumption as they are able to offer innovative solutions with significant environmental and social benefits. Their experiments chart a new path and provide valuable lessons for policy makers interested in advancing sustainable consumption. To illustrate this, we focus on furniture reuse and present the case of The Furniture Trust, a small, non-profit company based in Boston, Massachusetts. We first examine the problem of surplus furniture and the dominant strategies for managing it presently. Next, we discuss The Furniture Trust business model and related environmental and social impacts, including the "the multiplier effect." We then examine the main drivers, barriers and future opportunities for furniture reuse. We find that four main strategies are needed to advance furniture reuse: a) improve furniture design including greater modularity and elimination of hazardous chemicals; b) introduce mandates that ban or tax furniture disposal into the waste stream or involve extended producer responsibility (EPR) requirements; c) raise awareness about sustainable options; and d) improve measurement and reporting of the environmental, social and economic impacts of furniture reuse compared to recycling and disposal. In addition, there is a need for greater government support of environmental entrepreneurs through funding, network development, and policy actions, in

order to legitimize such niche players and promote societal transition to more sustainable consumption.

Sustainable consumption and business

The concept of *sustainable consumption* was first introduced in 1994 by the Norwegian Ministry of Environment as "the use of services and related products which respond to basic needs and bring a better quality of life while minimizing the use of natural resources and toxic materials as well as emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardize the needs of future generations" (Norwegian Ministry of Environment 1994). It is closely related to the concept of sustainable development and reflects the recognition that unless we change our consumption patterns, sustainability cannot be achieved.

Related to sustainable consumption is the more recent concept of the "circular economy" (CE), which is broader and incorporates both production and consumption with the goal to maintain the value of products and materials as long as possible and minimize waste and resource use (EC 2018). The CE is based on three main principles: a) "designing out" waste, b) separating the biological from technical nutrients where the former are returned back to the biosphere, and the latter are reused indefinitely, and c) using renewable energy to "decrease resource dependence and increase system resilience" (WEF 2014). Cities and companies around the world are increasingly embracing such strategies and the European Union has launched an ambitious action plan for advancing the circular economy with concrete waste reduction goals, regulations, and measures of success (EC 2017). It is estimated that the CE will provide an economic opportunity of $4.5 billion by 2030 as well as significant social and environmental benefits (Accenture 2018).

Since the 2002 World Summit on Sustainable Development called for accelerating the shift towards sustainable consumption and production, there has been a growing number of global initiatives spurred by governments, businesses and NGOs to define, promote and measure progress. Business has a major role to play in such transition in terms of both adopting more sustainable consumption practices and educating its consumers to use less "stuff." Such an approach, however, requires innovation and adapted business models to combat the present economic system wherein companies are financially rewarded for selling more stuff (Veleva 2014).

Most research to date has focused on original equipment manufacturers (OEMs) taking back and remanufacturing or recycling old products. This option however is not financially viable for many companies with global supply chains, due to a lack of mandates, upfront costs, logistical hurdles that include transportation and technical recovery challenges, and the inertia of 'business as usual'. Moreover, manufacturers often do not want to offer lower cost products as they would erode profit margins from new product sales (Matsumoto 2009; Guide & Jiayi 2010; Veleva et al. 2013). This presents an opportunity for entrepreneurial companies with innovative business models to fill the market gap and provide critical links for corporations in reverse supply chains while creating new business opportunities with social benefits (Heiskanen et al. 2011; Veleva & Bodkin 2018).

In this chapter we examine the issue of surplus furniture and how a small non-profit company, The Furniture Trust, has adopted an innovative business model and strategic partnerships to advance furniture reuse with significant environmental and social impacts. We argue that entrepreneurs are better positioned to advance sustainable consumption as most large companies are focused on recycling which still wastes valuable resources and is associated with emissions and occupational exposures. We provide recommendations for policy actions to advance societal transition to more sustainable furniture use. Our research contributes to the literature on the role of environmental entrepreneurs (also called "ecopreneurs") in launching "innovative experiments" that offer lessons for policy makers interested in advancing a transition to sustainable consumption systems (Gibbs 2009).

The role of environmental entrepreneurs in sustainable consumption

The role of entrepreneurs in advancing sustainable consumption is still underexplored (Heshmati 2015). At the same time, entrepreneurs are critically important for solving complex problems that involve high uncertainty and risk because they are able "to produce value out of uncertainty" (York & Venkataraman 2010). Transitioning to sustainable consumption systems can bring both social and economic benefits and new ways of living that established market players are unable to provide due to strong "inertial forces," according to research by York & Venkataram (2010). Entrepreneurs are also better positioned to deliver social value, an area that has yet to be included into sustainable consumption frameworks and research (Murray et al. 2017).

Entrepreneurship is defined as "the process of starting a business, a startup company or an organization by developing a business plan and securing the necessary resources" (Heshmati 2015). While large companies can also be entrepreneurial, small companies are often seen as "major drivers for economic growth, breakthrough innovations and job/wealth creation" (Tilley & Young 2006; Heshmati 2015). They typically launch a business to address social or environmental problems. They are less concerned with profits (at least initially) and are better positioned to innovate and take risks. According to York and Venkataraman (2010), entrepreneurs are best positioned to solve complex problems and turn uncertainty into business opportunity with social and environmental benefits. While a niche player they are an important source of innovation that may offer solutions for addressing challenges in current socioeconomic systems (Gibbs 2009). Yet, charting a new path is highly risky and requires financial and political resources, which can "easily dampen the enthusiasm of entrants to confront the incumbents head-on" (Heiskanen et al. 2011).

The growing movement to source locally can be seen as an important driver and enabler for smaller companies that are focused on product reuse and waste repurposing (Veleva & Bodkin 2018). Such practices are critically important for advancing sustainable consumption as they help reduce packaging, transportation costs and greenhouse gas emissions (Ghisellini et al. 2016). The idea originated with Schumacher (1973) who emphasized that locally adaptive solutions have less environmental impact than large scale global solutions. With the 2017 Chinese National Sword, which restricted the import of recyclables,[1] it is becoming even more critical to find local solutions for product reuse and waste repurposing as a growing percentage of recyclables are been sent for disposal (Rosengren 2018).

While startup businesses may not be economically viable initially, this can change over time as a result of regulatory action or changes in the market (Bocken et al. 2014). In addition, research has demonstrated that while entrepreneurs have limited resources and reach, their ability to foster strategic partnerships with large players can stimulate disruptive innovation, leading to industry transformations, and if it pertains, more sustainable forms of development (Hockerts & Wustenhagen 2010).

Veleva and Bodkin (2018) propose a new framework for corporate-entrepreneur collaboration in a circular economy, based on developing strategic, mutually beneficial collaborations between entrepreneurs and large companies focused on product reuse, remanufacturing or waste repurposing (see Figure 1). Once an entrepreneur has come up with an idea for a novel product or service from another company's used product, packaging, or waste stream, the next step involves identifying strategic partners who can help in developing an adequate supply chain. Products and waste can be either reused, upcycled (converting into materials or products of better quality or environmental value) or downcycled (recycling into a material with inferior properties compared to the virgin material). Corporations or other large organizations (e.g., hospitals, universities, or nonprofit organizations) become suppliers to entrepreneurs as they generate significant amounts of old products, packaging or waste. Leveraging their knowledge and relationships with materials processors, distributors or other partners, entrepreneurs develop their new products and services, which they then seek to sell to corporations, nonprofits, other entrepreneurs or individual consumers. Veleva and Bodkin (2018) found that entrepreneurs and corporations that are focused on product reuse or waste repurposing must address two challenges in order to establish viable business models: a) create an attractive value proposition for owners of waste and surplus products, and b) identify customers for their new product or service. Being able to balance these two challenges is critical for reducing costs and generating profits (Veleva & Bodkin 2018).

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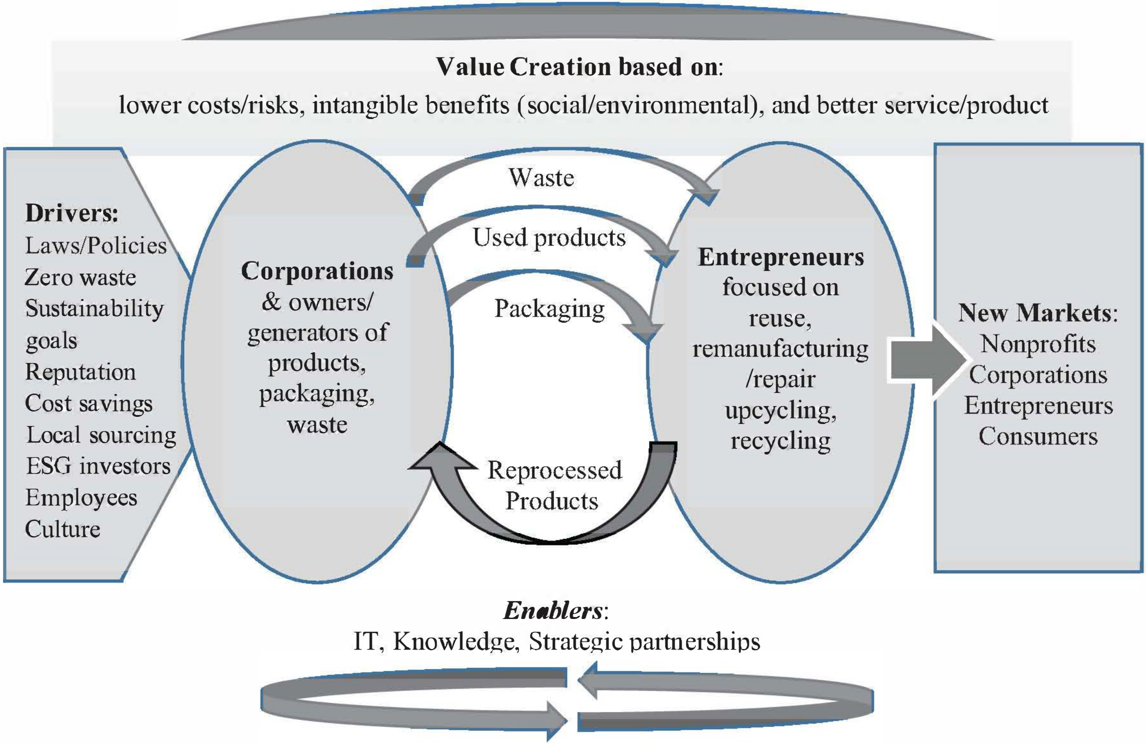
[1] In January 2018 the Chinese government enacted a new policy called the National Sword, which banned the import of 24 recyclables with contamination greater than 0.5%. This policy significantly affected the post-consumer plastic and paper recycling markets in the U.S. as China is the largest buyer of such materials and imported $2.3 billion worth of recycled plastic and paper in 2016 (see: https://cen.acs.org/articles/96/i2/China-restricts-imports-plastic-trash.html).

Transitioning to more sustainable consumption systems requires creation and reinforcement of a new path, as well as "destabilization of the existing path," according to Heiskanen et al. (2011). Path dependence is defined as the self-sustaining characteristics of existing systems, while path creation relates to creating new paths by engaging various stakeholders and generating momentum and respectively, change (Heiskanen et al. 2011). Environmental entrepreneurs are often seen as "agents of change" and "a major force in the overall transition towards a more sustainable business paradigm" (Schaper 2002, 27). While they are more likely to pursue path creation in sustainable consumption systems, the latter requires significant resources, including financial and political power, which they may lack. Therefore, such transition requires collective action and collaborations among various stakeholders, including users, NGOs, large companies and policy makers. Entrepreneurs must also work closely with customers to change their "evaluation criteria" in order to incorporate environmental or social considerations as they "cannot easily compete in production or service delivery efficiency with incumbents" (Heiskanen et al. 2011, 1893).

Figure 1. Framework for Corporate-Entrepreneur Collaboration in a Circular Economy (Veleva & Bodkin 2018)


Value Creation based on:
lower costs/risks, intangible benefits (social/environmental), and better service/product
Drivers:
Laws/Policies
Zero waste
Sustainability goals
Reputation
Cost savings
Local sourcing
ESG investors
Employees
Culture
Corporations & owners/ generators of products, packaging, waste
Waste
Used products
Packaging
Reprocessed Products
Entrepreneurs focused on reuse, remanufacturing /repair upcycling, recycling
New Markets:
Nonprofits
Corporations
Entrepreneurs
Consumers
Enablers:
IT, Knowledge, Strategic partnerships

In the following sections we focus on the case of furniture to illustrate how a small entrepreneurial company is creating a new path for more sustainable furniture consumption by leveraging collaborations with various stakeholders to overcome a range of barriers in the current socioeconomic system.

The problem of surplus furniture

In 2015 the U.S. furniture and home furnishing retail sales reached $111.4 billion (Statista 2017). Over half of the sales were for office furnishings, a market that is projected to grow at 5.2% globally between 2016 and 2023 (Research Nester 2018a). The U.S. and Canada are expected to see significantly higher growth driven by an expanding real estate industry and a shifting of business preferences toward innovative office furniture for increasingly flexible work environments (Research Nester 2018b). The main players in the office furniture segment include Herman Miller, Okamura, Steelcase, and Inter IKEA Group, among others.

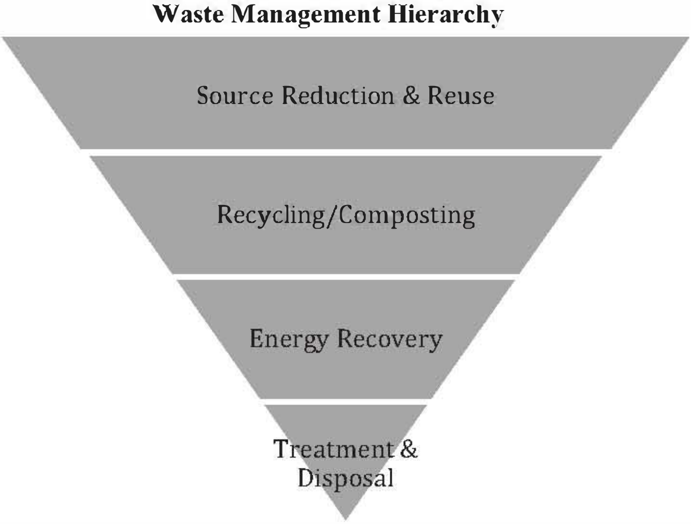
While furniture and furnishings are categorized as durable products, with an estimated average lifespan of 10 to 20 years (EPA 2014), most office furniture is not used until "worn out" but instead is replaced for aesthetic reasons (Besch 2005). This inefficiency in utility produces more waste down the supply chain, while increasing demand for raw materials up the supply chain.

The U.S. Environmental Protection Agency (EPA) estimates that households discarded 9.8 million tons of furniture in 2009 (Reuters 2011). In addition, companies annually discard about 8.5 million tons of office assets, which typically end up in U.S. landfills, representing 4% of organizations' costs (Bertoli 2017). This waste contributes to climate change as an estimated 42% of U.S. greenhouse gas emissions (GHG) are related to materials management (EPA, 2009). In addition, Gamage et al. (2008) report that raw material extraction/refinement and component production contribute to about 90% of the GHG emissions ofan office chair over its lifecycle. As landfills reach their capacity and waste incineration contributes to climate change, companies and policymakers must seek more sustainable ways of managing surplus furniture, a problem some experts now see as the new e-waste (Szczepanski 2017a).

The EPA's waste management hierarchy provides guidance for companies on the most and least preferred methods for managing non-hazardous materials (see Figure 2).

Source reduction and reuse is considered the most preferred way to manage furniture waste. One strategy for reducing the need for new furniture is *design for durability*, where furniture is designed to last for a long time. There are two problems, however with this strategy. First, manufacturers are unwilling to design long lasting furniture since this will lead to selling fewer products at higher cost and thus, negatively impacting their profits. Second, as mentioned earlier, most companies replace furniture for aesthetic or functionality reasons and not because it reached the end of its useful life. While research has found that reusing of old parts in new furniture could lead to cost reductions of up to 35%, this option is challenging due to the logistics of developing a take back system that ensures reliable supply of old parts in good condition (Besch 2005). Remanufacturing of used furniture is another potential strategy which reduces the cost and environmental impacts, however the main challenge is securing a viable secondhand market.

Figure 2. EPA Non-hazardous materials and waste management hierarchy (EPA 2018)



The next preferred strategy is furniture recycling, which has been demonstrated to reduce the net global warming impact of furniture over its lifecycle (Gamage et al. 2008). Several large furniture manufacturers have initiated programs to advance furniture reuse and recycling. In 2009, Herman Miller launched their rePurpose Program with the goal to divert 125,000 tons of used furniture from landfill by 2023, which is about half of what the company sells annually (Szczepanski 2017a). It leverages its partnership with nonprofits like schools, and large customers like General

Motors. Steelcase has focused on developing a circular business model where products are designed for continuous reuse. Its European program called Eco-Services helps companies evaluate their furniture inventory and identify options for reuse, donation and recycling. In 2016, the program diverted 30,600 cubic meters of material from landfill. In the U.S. the company has a similar program called Phase 2, which has helped divert 6.4 million pounds of furniture from landfills (Szczepanski 2017b).

Yet despite such efforts, the majority of office furniture continues to go to landfill or incineration. The EPA (2014) reports that "the recovery of furniture and furnishings for recycling is insignificant." Remanufacturing of furniture "is generally not feasible due to the difficulty in removing wood finishes and stains on the wood. Metal furniture, and in particular office furniture, may be recovered as steel scrap, however, this amount appears to be quite small at this time" (EPA 2014). The EPA has also found that furniture is "the number one least-recycled item in a household" (EPA 2014). In addition, recycling is associated with significant occupational exposures and illnesses (ILO 2012).

Energy recovery (also known as waste-to-energy or incineration) can lead to some benefits in terms of preventing landfill disposal and generating energy, however it still contributes to climate change (EC 2001). In addition, incineration is associated with air pollution as much of the furniture includes toxic chemicals such as flame retardants, volatile organic compounds (VOCs), and phthalates.

Landfill disposal is the least preferred method for managing surplus furniture as it generates waste and emissions, and leads to the loss of valuable resources, thus increasing the need for extracting raw materials to produce new furniture. Landfills have been found to release hazardous emissions as well as methane, a global warming gas 25 times more potent than carbon dioxide (Gabriel et al. 2014). They are also associated with soil and water contamination due to the leachate of chemicals.

A major factor behind the low rate of furniture recovery in the U.S. is the lack of extended producer responsibility (EPR) mandates. EPR is a policy approach where producers have the financial and physical responsibility to manage their products over the entire lifecycle of the product, which includes recycling and disposal. Such a strategy provides incentives for manufacturers to prevent waste at the source, promotes design for the environment (DfE) tactics and supports public recycling and government materials management goals (OECD 2001). While the European Union has implemented EPR mandates for a range of products, the U.S. has mostly adopted such mandates at the state level. As of 2018, mattresses are the only furniture product subject to EPR mandates in the

U.S. that have been adopted in Connecticut, California and Rhode Island. The success of the program was unequivocal in Connecticut, where within the first year alone the state reported a 54.8% increase in mattress recycling (PSI 2016). Yet, researchers have raised concerns that EPR mandates promote recycling over more environmentally and socially preferred uses such as reuse, repair and remanufacturing.

A solution to office furniture waste has coincidentally stemmed from an issue in the nonprofit sector. Office furniture is expensive, and many nonprofit organizations and small businesses cannot afford to purchase new furnishings. Having access to used furniture in good condition allows smaller organizations to allocate their limited funds to more critical, mission-related purposes. One such company that seized this opportunity is The Furniture Trust, a small non-profit business based in Boston, Massachusetts.

The Furniture Trust: Business model and environmental and social impacts

The Furniture Trust was co-founded in 2009 by Christine Mosholder, who has been managing commercial renovation projects for many years and identified a need for responsible solutions to deal with unwanted office furniture generated when a company moves to a new space. Mosholder found that corporations often under tight schedule and budget constraints need assistance with furniture removal at the end of a renovation project. Typically, a corporation writes a Request for Proposals (RFP) for furniture disposition, brokers bid on it making assumptions about what has value on the used furniture market and what will be thrown away, and the broker with the lowest bid wins the contract. Mosholder (2016) identified this wasteful process and decided to launch an organization that provides a social benefit by connecting unwanted furniture with local nonprofits and educational institutions, while limiting the amount of waste sent to landfills and incinerators as stated in its mission:

> The Furniture Trust is driven to make a positive, community impact with used office furnishings, while providing the most economical and environmentally responsible solutions to local businesses. We provide companies of all sizes with a proven process for decommissioning that maximizes the value of unwanted furniture assets. Leveraging our sustainable network, The Furniture Trust connects donated, office furnishings with local schools and nonprofits. (The Furniture Trust 2018a)

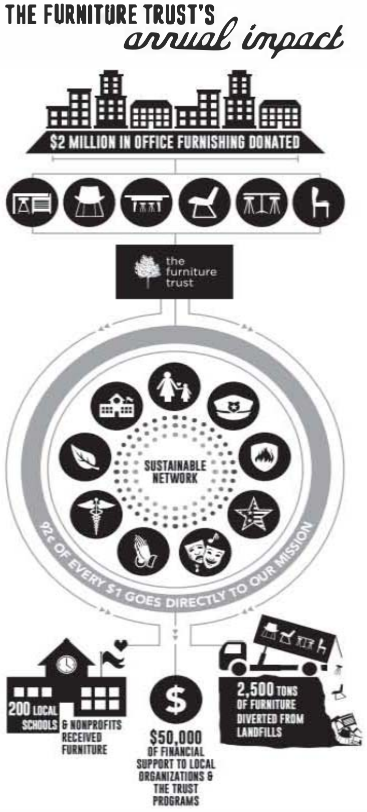
The company had about $2.7 million in revenue in 2016 (Charity Navigator 2018) and served the Greater Boston area, employing one full-time executive director and four part-time employees. The Furniture Trust focuses on repurposing virtually all-secondhand corporate furniture and office supplies.

The Furniture Trust has grown significantly between 2009 and 2016, increasing its customer base from 20 to 150 organizations, which includes more than 80 corporate contributors such as Biogen, Boston Properties, and Vertex Pharmaceuticals (The Furniture Trust 2018). It also has a network of about 900 non-profit recipients, including Boy Scouts of America, United Way and Boston Public Schools (The Furniture Trust 2018).

The Furniture Trust can best be described as a logistics company with a mission (see Figure 3). It relies heavily on partnerships with local laborers, carpenters and movers and takes the project management role to facilitate moves. It impacts the supply chain at the waste removal stage, offering a 3-pronged value proposition. First, it offers value to corporations by sustainably removing their surplus furniture and office supplies. It reports waste diversion quantities and fair market value (FMV) of equipment back to them to include in their sustainability reports. Secondly, they provide environmental benefits by diverting material from landfill or incineration. The Furniture Trust helped divert over 2,500 tons (or about 5 million pounds) of furniture since its founding (The Furniture Trust 2018a). They also provide value for nonprofits allowing them to reduce expenses and allocate funds to their core mission and activities. In addition, the company helps educate young people about sustainable consumption. Its signature program, the Eco-Carpentry Challenge, is an annual competition for high school students to leverage their carpentry skills and create new products from used office furniture (The Furniture Trust 2018b). The program educates students on the importance of upcycling and teaches them new carpentry skills.

According to DeVeau, they are able to differentiate themselves from used furniture brokers primarily by their social impact. Used furniture brokers can remove entire suites, where they generally sell what is valuable and discard the remaining equipment. The Furniture Trust however, makes a concerted effort to redeploy nearly all of the assets that they remove. Therefore, they target organizations with above-average environmental and social goals, since the company cannot compete solely on cost alone. By demonstrating the social impact in terms of served nonprofits, it helps large organizations meet their social and community support goals.

Figure 3. The Furniture Trust Impacts (The Furniture Trust 2018a)


THE FURNITURE TRUST'S
annual impact
$2 MILLION IN OFFICE FURNISHING DONATED
the furniture trust
SUSTAINABLE NETWORK
92¢ OF EVERY $1 GOES DIRECTLY TO OUR MISSION
200 LOCAL SCHOOLS & NONPROFITS RECEIVED FURNITURE
$50,000 OF FINANCIAL SUPPORT TO LOCAL ORGANIZATIONS & THE TRUST PROGRAMS
2,500 TONS OF FURNITURE DIVERTED FROM LANDFILLS

Additionally, the company's model gives them increased flexibility. DeVeau asserts that, "The good and the bad is that we are very flexible. If a customer says we have our own labor, we will just take from the dock out. If they need us to come in and do the whole job, we can do that too" (DeVeau 2016). The nimble structure of The Furniture Trust gives it access to companies with all kinds of removal needs. While The Furniture Trust participates in competitive bidding, it is challenging for it to compete just on cost as disassembling furniture for reuse is significantly more labor-intensive than disassembling for a landfill.

Their model requires minimal overhead, as they do not own vehicles or require storage (they discontinued the use of their warehouse in 2016). They assess an end user for all equipment prior to the execution of removals. This minimizes their environmental footprint by utilizing pre-existing logistics systems, labor and trucks. They partner with labor firms (both union and non-union), movers and carpenters to facilitate removal and equipment reconditioning.

The Furniture Trust receives a majority of its funding from donors and grants, and the rest from their furniture removal services (Charity Navigator 2018). The cost for furniture removal projects can range from $600 to $650,000 depending on the size of the project. Most of The Furniture Trust revenue is used to cover expenses such as labor, truck rentals, carpenters, technology and salaries to its employees.

The Furniture Trust business model generates significant environmental and social benefits, although measuring these is challenging. The company tracks the fair market value (FMV) of equipment removed and donated, as well as the weights of assets diverted from landfill (tons of waste diverted from landfill which is also converted to dumpsters saved). These indicators, however do not fully communicate the so called "multiplier effect" from their activities, or the added social, financial and environmental benefits of repurposing office furniture and supplies. For example, if company X donates equipment, they are not only cost-effectively removing it, but they are creating space for new equipment and preventing the human health and environmental impacts associated with landfill disposal and incineration. Similarly, when providing a non-profit with used furniture, they are allowing the institution to spend saved money elsewhere in their budgets. For instance, if the money saved is allotted to teacher professional development, a student may benefit from having an exceptional education down the road. When conducting the annual Eco-Carpentry Challenge, the company is not just teaching students about environmental protection and sustainable consumption, but also giving them a career path and introducing them to mentors. The ability to measure such impacts, however, is very challenging due to the lack of standardized indicators and the significant time and resources needed (Veleva et al. 2012; Veleva et al. 2017). Yet, it is critically important for raising awareness and shifting waste management practices from recycling and incineration to source reduction and reuse (Veleva et al. 2017).

Key factors for The Furniture Trust's success

A key factor behind the company's success is the growing importance of sustainability goals and commitments by large organizations. Corporations are seeing sustainability initiatives as key differentiators from competitors that increase their value proposition and attract talent (Lubin & Esty 2010).

Moreover, recent research has found that an increasing number of companies are committing to the expansion of their social impact (Winston 2017). Corporations can benefit from community involvement as demonstrated in a recent Boston College Center for Corporate Citizenship study (BCCCC 2016) and are including such information in their internal and external communications. For example, in 2015, Biogen highlighted its partnership with The Furniture Trust and recognized the manager who launched the program. Its 2015 corporate citizenship report states that "over two years Biogen donated 50 tons of furnishings, supplies, artwork, and construction materials" (Biogen 2016, 31). This type of collaboration provides benefits for both parties and increases brand awareness and company reputation.

In an interview, The Furniture Trust leadership identified the Leadership in Energy and Environmental Design (LEED) green building certification as a key driver in the post-consumer market (DeVeau 2016). Launched in 2000, LEED is a globally recognized green building rating system which provides certification based on a building's environmental performance and impacts (U.S. GBC 2018). The certification supports The Furniture Trust's objectives by requiring companies to consider where their furniture and equipment go after the end of their useful life. There are no specific points awarded for equipment recycling on the LEED scorecard, however, engineers and construction managers will attempt to maximize recycling potential by categorizing equipment, raw materials, and furniture, into what *is* and *is not* recyclable. This means that if a construction manager knows about The Furniture Trust services, they can consider working with the company once construction and demolition (C&D) of the facility commences, in order to obtain LEED.

Establishing strategic partnerships with key stakeholders is among the most important factors behind The Furniture Trust's success as demonstrated by Veleva and Bodkin (2018). Its collaborations with large organizations allow them to plan for major renovations and furniture removal needs. The company collaborates with carpenters, movers, and laborers, which maximizes capabilities without upfront investment in labor or equipment. This results in reduced overhead costs and allows their team to focus on bidding and contract procurement. Their partnerships with nonprofits allow them to effectively plan asset repurposing.

The Furniture Trust has discontinued the use of warehouse space by utilizing 'just in time' process—evaluating each piece of equipment and determining an endpoint for it. Enabled by information technology (IT), this approach reduces logistics costs, storage costs, and GHG emissions associated with delivering furniture to and from a warehouse. This sharing model provides flexibility and reduces operational costs. For many corporations, a quick and easy way to remove surplus equipment is the most important factor (Veleva and Bodkin 2017), which can benefit organizations like The Furniture Trust. The ability to be flexible with contracting is also valued. If a corporation has a union labor contract, they need to be able to work with that labor force to complete the project.

Regulation, including disposal bans and EPR mandates, is seen as a key driver for future furniture reuse and repurposing. In addition, a growing number of cities and states are promoting waste reduction and zero waste goals. OneNYC for example, introduced in 2015 by New York City Mayor DiBlasio, has established a goal to reduce commercial waste disposal 90 percent by 2030, and to minimize the waste generated and sent out to far-away landfills (City of New York 2015). In Massachusetts the Department of Environmental Protection (DEP) recently set up more stringent waste reduction goals in its Solid Waste Master Plan and committed to "assisting cities and towns to dramatically increase recycling and reuse" (Mass DEP 2013, iv). Such policies can help create markets for reuse and remanufacturing and support companies like The Furniture Trust.

While the furniture market is saturated, The Furniture Trust can provide a benefit not just to owners of surplus furniture, but also to manufacturers. For example, removing high-end material from secondary markets and mitigating environmental impacts from waste disposal could help furniture manufacturers like Steelcase meet their environmental and business goals. In a life cycle analysis (LCA) performed by Steelcase, the company found that for recycled content to be a feasible concept, material recovery at the post-consumer level is crucial. As such, Steelcase "needs to facilitate those processes either directly or indirectly by setting up proprietary systems (product take-back) or by cooperating with third parties" (Dietz 2005, 98). In addition, Steelcase seeks the use of local transportation to reduce emissions. The Furniture Trust addresses both of these needs, positioning itself well for a mutually beneficial partnership.

Another important factor for The Furniture Trust's success is its growing brand recognition, referrals and testimonials from current partners and clients. In addition, it is listed on Massachusetts Department of Environmental Protection website as provider of used furniture solutions, which helps spread awareness about its services (EOEEA 2017).

Challenges and future opportunities for furniture reuse

Despite its success to date, The Furniture Trust faces many challenges. First, it is at the mercy of the RFP bidding process and must convince customers that its higher-cost services bring value. Companies attempting to responsibly remove corporate assets have to compete against others who are willing to send these to landfill or incineration and, therefore, are able to submit lower cost bids for contracts. For many customers cost is the top factor when evaluating alternatives for furniture removal and presently these costs do not include the environmental and social impacts of end-of-life management (DeVeau 2016). Regardless of the increasing cost of landfilling and incineration in Massachusetts, it is still cheaper to do so compared to using The Furniture Trust services.

One of the most significant barriers for advancing furniture reuse is the lack of regulation. There are currently no regulatory mandates in Massachusetts and the U.S. that ban sending used furniture to disposal. However, there is a possibility for future regulation as states are grappling with the lack of disposal capacity and opposition to building new landfills or incinerators. For instance, the Massachusetts 2020 Master Plan has been developed to reduce waste entering landfills. This plan includes a new goal of limiting waste *disposal* rather than waste *generation* and Massachusetts DEP believes that "disposal reduction is a simpler, more direct, and more effective metric for evaluating waste reduction and diversion progress, including source reduction, recycling, composting, and other forms of diversion" (Mass DEP 2013, 17). In addition, the City of Boston has been discussing Zero Waste policy, although the proposed legislation is expected to only cover residential waste (City of Boston 2017). Another policy to limit disposal could incorporate EPR mandates. The European Commission has drafted a strategy around the circular economy, which includes waste reuse and recycling as a key aspect. As such, it has developed policy that requires manufacturers and producers to take responsibility for the proper management of their products at the end of their useful life (OECD 2001). This type of initiative, however, is unlikely to be enacted at the federal level in the U.S. considering the current trend of environmental deregulation.

Wider adoption of the LEED certification system and its tie to sustainable removal of furniture is another future opportunity as seen by The Furniture Trust. For example, the City of Boston became the first city in the U.S. to require LEED certification for all new buildings in 2007 (City of Boston 2014). Awareness of The Furniture Trust's LEED benefits will help them gain access to larger and longer-term projects and partnerships.

From an operational point of view and similar to many other entrepreneurial companies, The Furniture Trust lacks funding and resources. As DeVeau shares, "we need grants and donation money. Our team is strapped. If we had another 20 hours to give, we could do so much more" (DeVeau 2016). This confirms Rizos et al. (2015, 4) finding that "the lack of government support and encouragement including the provision of funding opportunities, training, effective taxation policy, and import duties, is widely recognized as a significant barrier in the uptake of environmental investments."

The lack of awareness is another significant barrier to the expansion of The Furniture Trust's services. In an interview, Mosholder stated,

> We're exceptional project managers, not sales people, and as a result our brand awareness suffers. By successfully executing projects and sharing our impact stories we are growing steadily based on our reputation. Just because Malisa [from Biogen] knows about us, doesn't mean the organization does. There can be 2 or 3 people who know about us at a dealership, but they don't share the information (Mosholder 2016).

Additionally, a student research project in Massachusetts in 2016 found that most companies would use The Furniture Trust's services if they knew about them (Veleva 2016).

In terms of technical challenges, modularity and standardization of equipment is an area that must be addressed. For furniture to be reused it requires disassembling of components, some of which would be reused and others recycled (for example, nonprofit offices are generally smaller than corporate offices and cannot fit corporate furniture without modification). However, most workstations contain welded metals with plastic and wooden components, which makes it difficult to recycle unwanted parts due to material mixing. Another technical challenge also related to furniture design is the use of hazardous substances like flame-retardants, which must be eliminated to advance furniture reuse (DeVeau 2016).

The use of more effective indicators to measure and communicate the environmental and social impacts of furniture reuse can help The Furniture Trust by strengthening its value proposition. Such metrics would allow large organizations to communicate the impacts of their actions, leading to improved reputations, ability to attract and retain higher quality talent, and programming to support their social and environmental goals. This confirms previous findings by Heiskanen et al. (2011) that promoting alternatives to the current system of consumption requires new evaluation criteria leading to "shorter 'mental' payback periods."

Finally, many countries are experiencing landfill space shortages, which will lead to greater need for alternative methods of disposal. With the Chinese National Sword limiting the import of recyclables, more local and state governments will seek local solutions for repurposing such material. This is expected to create opportunities for entrepreneurs partnering with large organizations and waste haulers to advance better uses of furniture and other surplus products.

Conclusion and recommendations

This chapter illustrates how a small, innovative company is creating a new path for more sustainable usage of furniture despite the lack of supportive government policies. Furniture reuse is associated with significantly greater environmental and social benefits compared to recycling or waste-to-energy disposal, and we argue that entrepreneurs are best positioned to deliver such value. They do so by establishing strategic partnerships with large organizations to source surplus products like furniture, and then donate to nonprofit organizations and others in need. By extending the useful life of furniture, they reduce the lifecycle impacts related to production, use and disposal, and at the same time provide numerous social benefits such as job creation, nonprofit support, student mentorship and career development, among others.

The main drivers behind The Furniture Trust success include large companies' sustainability goals, commitments to local sourcing and community support, LEED certifications, IT, and local waste reduction policies. Raising awareness about their services by implementing alternative criteria to demonstrate their more significant social and environmental impacts are critically important for their success, confirming Heiskanen et al.'s (2011) findings. Yet, the company lacks financial resources to scale up operations and lacks the political power to advance policies that would support furniture reuse versus recycling or incineration.

The Furniture Trust case, however, provides some valuable insights and lessons for policy makers interested in advancing sustainable consumption:

First, there is a need to raise awareness about the environmental and social impacts of reuse versus recycling and disposal in order to change the evaluation criteria used by customers (either large organizations or individuals). One way to do so is by introducing effective indicators to measure the environmental, social and economic impacts of different options and to require their reporting at product levels.

Second, policy makers need to introduce mandates that tax or ban unsustainable disposal methods. Taxing could be used as an instrument to account for the environmental and social costs of disposal and thus make alternative strategies more financially viable. Bans on furniture disposal could create a demand for alternative management strategies and support entrepreneurs like The Furniture Trust.

Third, there is a need to improve furniture design to advance modularity and eliminate hazardous chemicals such as flame retardants. While some companies like IKEA have voluntarily pursued such strategies, a government mandate would ensure that all manufacturers incorporate such practices. In addition, there is a need to address regulatory barriers such as the current fire safety standards which are the main reason for the use of toxic flame retardants.

Fourth, introducing EPR mandates for manufacturers could lead to changes in furniture design that could promote reuse and recycling. These mandates could also incentivize manufacturers to seek partnerships with local entrepreneurs for furniture repurposing. All of these recommendations, we argue, have merit in informing policy makers on how to promote sustainable consumption practices.

Our study has several limitations; it is focused on a single case of a company that is a nonprofit and working with other businesses rather than consumers. A future study should consider analyzing a larger number of companies in a specific sector to examine path development towards sustainable consumption. Future research should also include business to consumer (B2C) companies and examine how business model innovations are able to address both the rational and irrational motives of consumers in an attempt to change their behavior (e.g., buying green or remanufactured products, returning products for reuse or recycling, leasing instead of buying products).

The main contribution of our study is that it demonstrates the role of environmental entrepreneurs in creating a new path towards sustainable consumption. Our research confirms previous findings regarding the ability of entrepreneurs to introduce innovative business models, products and services that address environmental problems, while creating social and economic benefits. It demonstrates that in sustainable consumption initiatives value is created along the value chain, which is seen as a system (e.g., customers become suppliers of old products and waste). Advancing sustainable consumption practices requires redesigning products and packaging to eliminate toxic chemicals and promote ease in disassembly and reuse/recycling. It also requires adopting new indicators which better measure and communicate the impacts (environmental, social and economic) of different disposal strategies. Scaling up sustainable consumption practices, however, requires collective action and collaborations among various stakeholders, including users, NGOs, large companies, and policy makers. Finally, there is a need for government leadership in shifting tax policies and helping to decouple profits from resource consumption.

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CHAPTER TEN

BUYING INTO A MOVEMENT: LESSONS LEARNED FROM THE CASE OF THE FAIRPHONE

FRANZISKA HAUCKE

Abstract

This chapter examines the Fairphone as a case for a lifestyle movement. The Fairphone is both a company and a smartphone and combines ethical and sustainable considerations within the information and communication technology (ICT) market, acting as a potential movement entrepreneur. This study concentrates on the political mobilization and ecological concerns of Fairphone consumers. Hence, I delve into the relation of social movement theory and sustainable consumption by analyzing forms of civic engagement and strategies of market transitions provided by the Fairphone, and how these are translated to its consumers, the Fairphone community.

To operationalize this study, I used an online survey of the purchasing reasons and self-reflections of Fairphone users. The questionnaire allowed statistical as well as qualitative in-depth analysis of N=403 participants. Data was also obtained from the Fairphone blog to gain information on the Fairphone Company, the production process and the smartphone.

Results indicate that Fairphone community members see themselves as actively involved in the construction of the Fairphone and its related meaning, which suggests there is a collective identity accompanied by Fairphone use. They acknowledge their activism as broader than the mere purchasing of a smartphone, whereby the phone itself is considered as an artifact for personal self-expression. Moreover, they view consumption through the lens of ethical and environmental responsibility to change society by forming a group of consumers acting individually yet joined by the collective goal of a broader sustainability transformation.

Introduction

Despite the fact that alternative and sustainable forms of consumption seem to be increasing in public perception, they are not carried over into the technology industry. Taking into consideration that the estimated number of mobile phone users will pass the five billion mark by 2019—of which will be 2.7 billion smartphone users alone (Statista 2018)—turning smartphones into the fastest growing new technology that will highly alter daily life on a global scale (Bento 2016)—the marginal role of sustainable electronics is quite surprising. To exacerbate matters, e-waste and other environmental and social hazards are on the rise and will increase even more drastically due to this enormous growth of the smartphone industry (Zhang, Schnoor, and Zeng 2012; Mont, Neuvonen, and Lähteenoja 2014).

One of few exceptions is the Fairphone Company, which was founded in 2013 and follows an alternative path in the information and communication technology (ICT) market by applying sustainability characteristics to a smartphone (Haucke 2017). Such small firms might enable a transformation of an entire industry towards sustainability (Hockerts and Wüstenhagen 2010) and niche products, like the Fairphone, are assumed to raise awareness for sustainability amidst the public (Seyfang and Smith 2007). Hence, these sustainability companies bear the potential to enable social movements through consumption (Grabs et al. 2016). This potential occurs since consumers themselves can induce social change by self-activism through changes in their lifestyles through their personal consumption behaviors (Wahlen and Laamanen 2015). A decision to purchase a Fairphone can be considered a value and attitude expression (Haucke 2017) and such consumption choices might even become a political behavior (Bennett 2012; Copeland 2014, Pollex, Haucke, and Lenschow 2016) and hence part of social movement activism (Holzer 2006).

The traditional scholarly understanding of social movements views their activism as drawn on capacities, resources (McCarthy and Zald 1977), and political opportunity structures (McAdam, Tarrow, and Tilly 2001) in order to challenge authorities (Snow 2004). Cultural-ideational explanations of movements, however, have typically been excluded from this angle of research by giving prevalence to structural explanations of (internal) organization or (external) political opportunity structures (Snow and Benford 1992). Sustainable consumption makes these analyses even more complicated since it calls for a change of consumer culture and movement activities occur inside the walls of the home. Sustainable consumption considers the social, economic and ecological consequences of the acquisition, use and disposal of goods and services in order to optimize these effects (Phipps et al. 2013). People practicing sustainable consumption integrate a wider social context within their personal shopping behaviors, which presumably include a reflection on political and/or ethical reasons of a purchase (Stolle, Hooghe, and Berlin 2005). This focus on sustainability and social justice goes beyond the fulfillment of personal needs (Black and Cherrier 2010) and therefore inter-connects the public and the private sphere (Evans 2011; Micheletti, Stolle, and Berlin 2012; Micheletti and Stolle 2012; Phipps et al. 2013; Stolle 2005; Wahlen and Laamanen 2015). Consequently, people can experience their "personal politics" in terms of "personal lifestyle values" (Bennett 2012, 22) and no longer organize their lives around traditional group identifications such as social classes or political parties (Cherry 2015).

Few studies transcend the boundaries of personal lifestyles, social movements, and politics, mostly because daily activities are considered individualistic and hedonistic acts. Most scholars argue that consumption practices are tied to dominant cultural patterns and divorced from outcomes in social, economic and environmental domains.[1] On the contrary, I argue in this chapter that consumption practices may be seen to mirror a new form of political participation (de Moor 2017; Haucke, Pollex, and Lenschow in this volume; Pollex, Haucke, and Lenschow 2016; Micheletti and Stolle 2012) and engender a politicization of everyday life (Baringhorst 2015). I study the Fairphone as a form of political consumption because it unites activists that aim to change the production and consumption of smartphones. They also want to reach a broader transformation of institutions and structures, which produce the problematic aspects of capitalist markets, such as social inequality and environmental hazards. This might be done, for example, by direct and ongoing relationships between producers and consumers improving social and environmental conditions within producing countries (Forno and Graziano 2014). These interactions evolving around the Fairphone might contribute to behavior and consumption changes that establish consumption as a movement tactic (Holzer 2006). Similar important, "[s]ocio-technical changes associated with the Internet allow for new ways of communicating and interacting in the social sphere, which has impacted on the everyday lives of individuals and communities" (Cruz, Ganga, and Wahlen 2018, 2) making the Fairphone not only interesting as a "sustainable product" but also as an enabler of new forms of interaction. The Fairphone, therefore, might serve as a new type of social movement in which individuals "consciously and actively promote a lifestyle or a way of life … to foster social change" (Haenfler, Johnson, and Jones 2012) referred to as lifestyle movement (Dobemig and Stagl 2015; Haenfler, Johnson, and Jones 2012; Haucke 2017; Wahlen 2017; Wahlen and Laamanen 2015). Consequently, the Fairphone can form such a movement centered on the usage of a smartphone (Haucke 2017).

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[1] For an exception see Dobernig and Stagl (2015); Haenfler, Johnson, and Jones (2012); Haucke (2017); Haucke, Pollex, and Lenschow in this volume; Pollex, Haucke, and Lenschow (2016); Wahlen (2017); Wahlen and Laahmanen (2015).

In this chapter, I argue that Fairphone's potential of lifestyle mobilization necessitates an extension of movement literature in three domains. First, given the marginal role of sustainable electronics, it is hardly surprising that studies applying the concept of lifestyle movements are rather based in the area of food---e.g., foodsharing, see Wahlen (2017); veganism, see Cherry (2015); urban gardening, see Dobemig and Stagl (2015). I try to close this research gap by investigating the Fairphone as it is well known that "the use of smartphones … has changed the role of the Internet in daily life, enabling [individuals] to communicate with each other from anywhere, buy the latest fashion, order a taxi, do grocery shopping, show friends what [they] are eating, etc. and stay continuously connected" (Cruz, Ganga, and Wahlen 20018, 2). Therefore, smartphones may have an impact on all areas of social practices. Second, digitization has changed contemporary life, which does not stop at the process of social movement organization. The online mobilization and concentration around one single product – as far as I can tell – has not been described so far, pointing to new mechanisms in lifestyle mobilization. The Fairphone Company's ability to harness new technologies and embrace novel approaches to progressive social change, based on grassroots community mobilization, is in many ways unique. Yet, the Fairphone can also be viewed as a part of an emerging cluster of sustainable products that are implementing similar processes and strategies. Thus, another objective of this study is to open up new avenues for future research on product and internet-based lifestyle movements.

Methodology

A case-study approach is applied to empirically investigate the Fairphone as a lifestyle movement by using both quantitative and qualitative approaches to bypass methodological limitations (Wahlen 2017; Yin 2014). The data used for this study is based on an online survey as well as quantitative data gained from the Fairphone blog via the homepage of the Fairphone Company. The survey consisted of both standardized multiple-choice and open-ended questions covering basic information about Fairphone, mobile phone usage, personal sustainability habits, and sustainability in general. A four-point Likert scale indicating [1]=agree, [2]=partly agree, [3]=neutral and [4]=disagree was used on the instrument.

Such an unbalanced scale is suitable if it is hypothesized that one direction is more likely to appear. In the case of the Fairphone, it was assumed that the participants had positive attitudes towards sustainability, which motivated them to purchase a Fairphone, especially given the technical disadvantages of the Fairphones compared to other smartphones. The survey was available in German, English and French and circulated via Facebook fan groups as well as the forum on the company's homepage during November 2015. The survey's duration time was 14 days. The total number of complete questionnaires was 403. It was a voluntary and purposive sample of convenience, since the participants didn't receive any benefit for their participation.

The mixed-method approach of this study allowed different aspects of individual smartphone choice and consumer behavior to be included. In doing so, the data was analyzed in two manners. First, a quantitative approach was conducted to provide an overview of the Fairphone community's values and consumption habits (see also Haucke 2017). Second, a qualitative in-depth analysis of the open items (added to each survey question) and open questions was undertaken to understand the meaning of the Fairphone to its users. The open item option was chosen to enable Fairphone community members to articulate their personal and individual interpretation of Fairphone and everyday sustainability practices. For this purpose, two open questions—in addition to the open items —were integrated in the survey. One was placed at the beginning, for example, before starting the survey, it was asked "we would like to ask you to describe thoughts on Fairphone that spontaneously come to your mind. What is of particular importance about Fairphone? Do you have any associations?" The other one was presented at the end of the survey and was only available for those participants that responded in former questions if they would describe their lifestyle as sustainable: "You answered that your lifestyle could be described as sustainable. How did you shape such a lifestyle?" For the purpose of this study, I have personally translated German and French responses. To supplement the survey data, excerpts from the Fairphone blog were used, in order to obtain information on the Fairphone Company. The blog is hosted by the Fairphone Company and written by Fairphone employees or contains byline articles, for example, by employees of NGOs that cooperate with the Fairphone Company. All articles mostly contain information on the production process of the smartphone, the cooperation with NGOs and the smartphone industry as well as background information on sustainability and smartphone consumption.

The unique case of the Fairphone

The Fairphone represents a unique case within social movement research as it bears the potential to form a movement based on a product. This potential occurs since the Fairphone combines movement characteristics for its users through sustainable consumption, organizational networking, and online communication enabling ordinary people to connect and form collective claims, e.g., by forms of civic engagement (Pattie, Seyd, and Whiteley 2003) as well as through sustainable business strategies (Demaria et al. 2013) realized by the company itself (see Figure 1).

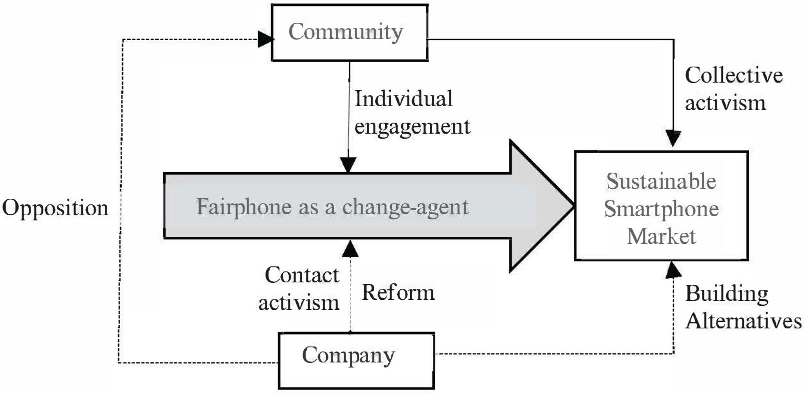

Figure 1. Fairphone's movement process comprising sustainable business strategies and civic engagement.

Fairphone as a product and a company combines three forms of civic engagement (Pattie, Seyd, and Whiteley 2003): individualistic activism (i.e., buying Fair Traded resources), contact activism (i.e., signing a petition, engagement with political institutions), and collective activism (i.e., attending a public demonstration respectively collective online activity), as explained further below.

The Fairphone Company's advertising slogan "start a movement buy a phone" is convertible into a simple mode of personal action that can easily be undertaken by any ordinary individual. The 'buying' aspect expresses consumption as a form of activism. The 'movement' character is related to the raising of awareness of the working and production conditions in the manufacturing countries, offered by the Fairphone Company. By surfing the company's homepage, for instance, people can get information about resources needed and working conditions in the production process of smartphones. People can also get information on the various initiatives and institutions the Fairphone Company cooperates with in order to enhance sustainability and fairness within their business practices. The company itself offers a solution to the problem: buying a Fairphone, which was the first phone that included considerations on sustainability within their operations—as detailed in this chapter. Hence, Fairphone's operations enable forms of *individualistic activism* because individuals not only access the possibility of rethinking their consumption behavior but also have the possibility to realize a more sustainable form of smartphone consumption.

Private decisions like the purchase of a smartphone can operate as a tool to enhance sustainable behaviors if articulated towards policy and political institutions (Pattie, Seyd, and Whiteley 2003; Wahlen 2017). For example, Fairphone representatives attended a conference at the European Parliament regarding a proposed European regulation on responsible sourcing in conflict areas (Fairphone 2013). In addition, the company undertakes public visible media campaigns and cooperates with NGOs, e.g., "Closing the Loop" (Fairphone 2013a). Therefore, the Fairphone Company is also an intermediary actor, which offers opportunities for consumers to engage in forms of *contact activism.*

Collective activism is encouraged through the formation of an online community (that will be described in more detail below), which motivates people to express their support for campaigns through posting comments or "liking" others, as well as active participation in the design and development process of the Fairphone through its co-productive approach (van der Velden 2014).

This co-productive approach is characterized by an open-design strategy, for example, it allows users to edit the Fairphone software to their own needs, to open up the smartphone to repair specific items, to be a part of the funding process of the smartphone due to crowd funding, and to develop a phone according to their needs (e.g., Fairphone 2013b Fairphone 2013c, Fairphone 2015). This approach is also a strategy of the company towards more sustainability, offering opportunities of political engagement through sustainable consumption based on the voluntary engagement of consumers in terms of time and resources (Grabs et al. 2016). The Fairphone (smartphone) generates the potential for behavior change because it "operate[s] in civil society arenas [the daily life of its consumers] and involve[s] committed activists experimenting with social innovations as well as using greener technologies" (Seyfand and Smith 2007, 585). In doing so, Fairphone supports the evolution of a green niche to the smartphone market, which might entrap leaders of the broader phone industry to take a greener path once the market share reaches observable importance (Hockerts and Wüstenhagen 2010). Hence, companies might also act as leverage toward sustainability by other means such as lobbying (or as illustrated above: contact activism), for example, if they offer niche products (Hockerts and Wüstenhagen 2010; Seyfang and Smith 2007).

Fairphone offers a smartphone, in a unique marketing approach that combines sustainability and fairness characteristics within a co-design process. It is therefore possible to identify three basic business strategies towards a sustainable economy within the business concept of the Fairphone Company (see Table 1).[2] These span between the reformism of contemporary systems (i.e., by offering sustainable products within the traditional distribution channels), a building of alternatives (i.e., a development of alternative systems like the sharing economy) and an oppositional activism (i.e., by the boycotting of the current capitalist markets, like for example self-supportive groups in the area of food) (Demaria et al. 2013; Haucke 2017).

Looking at both the business strategies of the Fairphone Company and the forms of civic engagement described above, it seems that the business strategies for sustainability and the forms of civic engagement work together to enable a social movement occurring around a product. In particular, the reformism strategy seems to open up an avenue for individual activism in the form of sustainable consumption. In addition, this strategy also seems to support contact activism for consumers, as the intermediary role of the company, characterized through the cooperation with NGOs and the broader phone industry, connects consumers to the public and political sphere. The building of alternatives in regard to traditional consumption, again, offers consumers the opportunity to engage with individual activism in the form of behavioral change. Even the strategy of opposition activism helps individuals to engage with collective activism, e.g., by organizing boycotts of unfair traded smartphones and manufactures. Hence, it seems that the combination of both civic engagement and business strategies for sustainability provides the potential of the Fairphone to form a social movement based on a product.

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[2] Demaria et al. 2013 developed these strategies in regard to degrowth, however degrowth is assumed to be one part within a broader sustainability discussion.

Table 1. Business strategies within sustainable consumption applied to the Fairphone.

Strategy	Description	Consumption	Fairphone
Reformism	Social change occurs within current system: contemporary institutions need to be improved and defended in strengthening political participation and democracy.	Eco-Labeling	Applying the Fair Trade concept to a Smartphone; Cooperation with the industry.
Building Alternatives	Development of local, decentralized, small scale and participatory alternatives outside of the present system. Main target is the behavior and value change of individuals as well as lifestyle changes.	Eco-villages, time banking, reuse, sharing economies/ collaborative consumption, vegetarian- and veganism.	Open design strategy; changing smartphone production system; rethinking material use and reuse via repair support and modular design for longevity; raising awareness of production background.
Opposition activism	Questions dominant cultural habits. Solutions are created outside the current system as oppositions of contemporary processes (presentation of alternatives is not necessary).	Boycotting, Campaigning	Starting as a campaign; replacing unfair/unsustainable mobile phone production.

Source: Haucke 2017.

While the Fairphone merely as a product does not form a social movement, there are dynamics related to the company and the phone that enable movement potential. First, processes in which both individual (Fairphone community) and organized (company) actors are involved in a collective action in pursuit of a shared goal are known to lie at the bottom of social movement organization (Della Porta and Diani 2006). Yet, against the backdrop of traditional movement studies, online communities like the Fairphone have not been considered a social movement as they neither have a political purpose nor address political institutions. Rather, they target cultural and economic codes while demonstrating their collective action with non-institutional tactics (Diani 1992), for example, private consumption choices. Second, according to Cherry (2006), the embeddedness of the Fairphone within the daily life of its consumers associates the Fairphone with a lifestyle movement that "measure[s] success in terms of change to everyday behaviors and lifestyles" (156). Therefore, the following section will consider the Fairphone not only as a product, which enables the pursuit of ethical and political ideals, but also as a collective political platform. Third, especially the interactive and co-productive design process of the Fairphone connects various actors ranging from ordinary individuals to NGOs and other players of the smartphone industry (van der Velden, 2014), which opens up an avenue for public perception of the sustainability challenge within the ICT market. The aim of this chapter, therefore, is to delve into the dynamics connected to the phone, such as the company's activity as well as the online community.

The Fairphone community

Fairphone shows interesting aspects of micromobilization processes based on Internet technologies, which have recently gained prominence in the transport of movement ideas and ideologies, organization of activities, and mobilization of the public (see Haucke, Pollex, and Lenschow in this volume). Especially social networking sites (SNS) like Facebook and Instagram are increasingly important to connect individuals and are a major part of a movement culture (Della Porta and Diani 2006; Kim, Kim, and Yoo 2014). With their participation in such online communities, individuals are able to share (virtually) their beliefs and ideas. In doing so, social networking "allows individuals to express themselves not only in the analogue world, but to an increasing extent in a digital version of the self" (Cruz, Ganga, and Wahlen 2018, 2). Therewith, these communities fulfill the core requirement for lifestyle dynamics, which is, that individuals become aware that their behavior does not only have an effect on themselves but also on the external world (Black and Cherrier 2010) and, therefore, they provide or increase the political awareness toward a given protest issue (Passy and Giugni 2001). These locations might occur via social media (Haenfler, Johnson, and Jones 2012), but they are not limited to the virtual world, since in the area of food such communities also occur offline in different local areas (Cherry 2015; Dobemig and Stagl 2015; Haenfler, Johnson, and Jones 2012; Laamanen, Wahlen, and Campana 2015; Wahlen 2017). Irrespective of the context, whether it is online or offline, such communities form an interactive structure enabling individuals to define and redefine their framing of the social world (Passy and Giugni2001). For instance, the communication of ideas and beliefs concerning topics like sustainability and sustainable smartphones in particular might increase perception of these topics within groups (Fine and Kleinman 1979). This is made possible as individuals can communicate with each other their shared frustrations, solutions and possibilities in order to develop new behavioral patterns to increase sustainability within society. This so-called socialization function of social networks intervenes at the beginning of social movement processes and performs a cultural role of a social network. Community participants gain a political consciousness with regard to a practical issue such as sustainable consumption and develop shared values, beliefs and identities (Passy and Giugni 2001) simply due to the interaction with link-minded people.

The socialization function of the Fairphone is characterized by a constantly growing community, which follows Fairphone's progress through the company's forum and through social media and shares knowledge and experiences concerning the Fairphone (Meier and Mäschig 2016). As a consequence, members of the Fairphone community neither need to have physical contact nor belong to the same group of individuals (e.g., in regard to nation, social group, etc., see Table 2). However, they form a collective – if only online – around a shared goal, the Fairphone (Haucke 2017).

According to previous studies, members of Internet communities claim that their virtual involvement alters their offline life (Borrero et al. 2014), e.g., through the facilitation of communication between people that are already involved in social or political networks (Mosca 2010), which opens up an avenue for movement potential. Looking at the interactions via social media of Fairphone's community members, the potential of ICT based mobilization is empirically supported. In particular, the communities' interactions seem to lead towards shared beliefs as well as an ongoing communication within and outside of the community (see Table 3). Similar results were found by Alexander Meier and Florian Mäschig (2016) that conducted a discourse analysis of the Fairphone forum showing that the ongoing communication between the Fairphone users and the company via the online forum of Fairphone creates and consolidates a discourse on the smartphone itself that mostly is short-term but might also establish ongoing social relations between the consumers and the producers. Hence, the Fairphone (community) seems to enable individuals to work together and inspires a deeper commitment for sustainable practices and therefore shows a socialization function.

Table 2. The profile of the survey participants (N=403).

Variable	N (number)
Male	226
Female	170
Fairphone users ordered by country	
Germany	211
France	53
Switzerland	47
Austria	16
Sweden	16
Belgium	14
UK	9
Nederland	6
Denmark	6
Other European countries	18
Non EU	5
Age of Fairphoners	
<20	19
21-30	157
31-40	107
41-50	69
51-60	36
>60	15

Source: own.

Table 3. Strong and weak ties within the Fairphone Community.

Variable	N(umber)	Valid Percentage
Active via Fairphone's forum.	82	33.7
Active on Fairphone's Facebook Community.	110	45.3
Went to a Fairphone meeting (offline).	16	6.6
I meet Fairphoners on a regular basis (offline).	8	3.3
I have Friends or Family who also own a Fairphone.	155	63.8
Fairphone users are similar to me.	51	21
I feel that I am a member of a community.	80	27.2
Fairphone users have similar beliefs and attitudes to me.	171	58.2
I connect via social media to communicate about sustainability.	78	40.2

Source own.

Based on the finding that a collective understanding of the Fairphone within the community is tied to an environmentally friendly attitude, it is of particular interest that the Fairphone was named as a form of symbol to express such attitudes:

> I have used [the Fairphone] for about one year. It becomes increasingly a symbol of status within environmental-friendly-circles (Fairphone community member number 106[3], as a response to the first open question).

As a symbol, the smartphone seems to express personal attitudes towards sustainability and sustainable behaviors. It also supports individuals in expressing to others their membership in a sustainable oriented group, also known as symbolic consumption within subcultures (Belk 1988; Schouten and McAlexander 1995). This feature of a product is called signaling. It describes a process of providing information about oneself implicitly to others through behavior patterns and characteristics connected to the product that rub off on its owner (Hartmann and Apaolaza-Ináñez 2012). Hence, high signaling products enable individuals to express their social role as well as evaluate others and place these other persons in a social context. This dynamic underlies an understanding of consumption, where products are chosen by personal preferences and reflect the identity of a person (Solomon 1983; Schouten and McAlexander 1995). Consequently, the Fairphone (and other sustainable products) might be a tool to display proenvironmental and ethical attitudes (Hartmann and Apaolaza-Ináñez 2012). The Fairphone as a smartphone, therefore, has two meanings. First, it can be considered as an artifact of the Fairphone community used to express personal values, belief and an orientation towards sustainability. Second, it can be valued as the origin of the online community since it displays the topic that led to socialization within the Fairphone community. In particular, the Fairphone seems able to support a feeling of membership and even establishes a product community as well as supports individuals in expressing an identity. Hence, it not only shows a socialization function that is fundamental in micromobilization processes, but also creates a so-called *culture* of a group, which is formed around a range of elements composed of physical and visible aspects like artifacts and behaviors as well as ideational components like values and norms (Fine and Kleinman 1979). These behaviors are important within lifestyle movement studies, as they form the collective action through which movement participants intend to create a change towards the goal of the movement, simply by changing their everyday life practices (Haenfler, Johonson, and Jones 2012). Thus, from the participant view, they start to change the world by changing themselves.

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[3] The number is from my own coding system for the respondents.

Therefore, social interactions between movement participants are not only fundamental in terms of similar attitudes but also in regard to ongoing social relations that recruit individuals for collective actions, referred to as the structural function of social networks (Passy and Giugni 2001). Social networks need to have enough connectivity for ongoing activity and communication to gain compelling societal impact. This kind of consistency is made possible if community members form strong and weak (personal) ties based on shared values (Kennedy 2011). Strong ties are related to close friends or family members while weak ties mainly refer to acquaintances (Granovetter 1973) or netpals. Especially, the activity within different online communities and the evolution of personal ties between netpals offers opportunities for social movement recruitment since it not only influences movement participation through the socialization function (in regard to belief, attitude and identities) but also to the structural connection function (creating a contact between prospective participants and the movement) (Passy and Giugni 2001). Hence, personal ties can support individuals in political and behavior change by the provision of information and could therefore contribute to the formation of a social movement (Granovetter 1973). The survey data demonstrates a possible development of personal ties between Fairphone community members, which is illustrated among other things by a sense of connectivity and community feeling according to 27.2% of the Fairphone community members (see Table 3). These findings point towards a structural connection and a socialization function of the Fairphone online community upon which a social movement might be formed and maintained, based on weak and strong ties (Passy and Giugni 2001). The community enables members to ongoingly communicate on sustainability and develop new behavioral patterns beyond the usage of a smartphone (socialization function) and structurally connects individuals by offering an opportunity to communicate, and hence enables those individuals to participate together under a shared goal.

The lifestyle movement of veganism, for example, illustrates that the behavioral changes that are needed to maintain a vegan lifestyle are not only "dependent on individual willpower, epiphanies, or simple norm following" but are also more importantly "dependent on having social networks that are supportive of veganism" (Cherry 2006, 157). Accordingly, movement-based social networks, like the Fairphone community, seem to be of great importance to induce behavior changes. However, movement scholars, so far, have considered physical networking as an important factor for motivating behavior change in environmentalist subcultures and lifestyle movements (Saunders et al. 2014) while online communities have been neglected. The following section therefore delves into the motivation of behavior changes based on the participation within the Fairphone online community.

Behavior patterns of Fairphone's community members

It is empirically evident, that Fairphone online community members have high intentions to change contemporary society through consumption patterns (Table 4) and as a corollary develop new behavioral patterns.

Table 4. Beliefs and attitudes of the Fairphone community

Variable	Mean Score	Std. Deviation
Fairphone is a sustainable alternative in the mobile phone market.	1.46	0.91
Fairphone is fashionable.	3.18	0.99
Environmental protection is important.	1.07	0.29
I am able to make a difference with the Fairphone.	1.46	0.91
Important to always own the newest electronic device.	3.63	0.66
Necessity to change current economic	1.24	0.46
Important to improve labor conditions in production countries.	1.04	0.22
Commitment for the society is important.	1.17	0.4
Sustainability is important.	1.27	0.49

Source own. Mean score according to Likert scale: [1]=agree, [2]=partly agree, [3]=neutral and [4]=disagree.

The most visible examples for such a new behavior are found within the Fairphone community in the extended usage time of the smartphones compared to traditional smartphone users—who use their phone 12 months on average (see Paiano, Lagioio, and Cataldo 2013). The vast majority of the Fairphone community (87%) uses their smartphone longer than 2 years (Table 5).[4]

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[4] The data do not give any indication whether the behavior is a prerequisite for a changed thinking on smartphones in general or induced by the activity within the Fairphone community.

Table 5: Smartphone behavior of Fairphone community members

Variable	N (number)	Percentage
Owner of a Fairphone.	237	57
Waiting for delivery of a Fairphone.	24	13.5
Fairphone will be future phone if present phone breaks.	41	23
Support Fairphone.	182	77.1
Like the idea of Fairphone.	232	98.3
Like modular approach of Fairphone.	109	46.2
Include sustainability in daily life.	403	98.2
Use of cell phone		
< 1 year	3	0.7
1-2 years	50	12.2
2-3 years	136	33.2
3-4 years	103	25.1
4-5 years	67	16.3
5 > years	51	12.4

Source: own Calculated percentage in relation to number of participants answered the particular question; mean score according to Likert scale: [1]=agree, [2]= partly agree, [3]=neutral and [4]=disagree.

This behavior might even become more important due to the second generation of the Fairphone that is designed in a modular style with the aim of facilitating reparability.[5] The survey showed that 46.2% of participants (Table 5) saw a major advantage in this modular approach, of which they expected an increase of the longevity of the smartphone (as stated in the open items). The change in mobile phone consumption is also evident for the understanding connected to the Fairphone itself. Community members clearly articulate an understanding of their smartphone purchase as a way to transform society towards sustainable consumption:

> Directing future, new ways of consumption, hope that Fairphone might support a rethinking of society, sustainability (Fairphone community member, number 737, as a response to the first open question).

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[5] The delivery of the second generation of the Fairphone started during the duration time of the survey.

One survey participant furthers this understanding by pointing to elements of a sustainable development that exceed the smartphone usage and links an overall path towards a sustainable transition to the Fairphone:

> Sustainability through consumption: Fair, good for humans and environment, resource optimized, longevity, transparent. The product supports changes in society, economy and finance and minimizes resource and climate exploitation.… Helps [humanity] to be sustainable, respectively to survive (Fairphone community member, number 676, as a response to the first open question).

It comes as no surprise that the features of the Fairphone related to sustainability were named often as characteristic and important to the survey participants.

> I would like to buy a phone that is as close as possible to a Fair Trade phone. […] In the electronic industry there is still a lot of work to be done to make it more sustainable. Fairphone is both a way for a consumer to consume in a more sustainable way and a way to show the industry both that it is possible to produce a phone that is sustainable and that it is something the consumers want (Fairphone community member number 508, as a response to the first open question).

This quote highlights the power of consumers to use consumption as a political behavior as described by Holzer (2006). The survey participant is also aware of consumer power that could enable a change of the mainstream economy due to the success of sustainable niche products (Seyfang and Smith 2007). It further seems that members of the Fairphone community are well informed on the consequences of traditional growth oriented consumption and have a willing to change this:

> Emphasis on avoidance of exploitation is the most important feature [of the Fairphone]. To have the luxury of fantastic communications is important to me, but I don't want this to be at the expense of other people's life chances. Environmental sustainability is also very important the support for economical repair is valuable and the consideration of cradle-to-cradle life cycle thinking. It is also nice to buy something from a small independent group, which is not part of any multinational corporation (Fairphone community member number 480, as a response to the first open question).

This quote is remarkable because the survey participant highlights the functionality of the Fairphone as one important feature enabling sustainability, underlining the reparability of the Fairphone as well as the alternative business model of the company. That reparability increases the life span of smartphones and therefore should be a highly sought-after feature has been showed by previous studies – however these studies simultaneously point toward the small market share of such phones as oppositional to this argument (Makov et al. 2018, 2). It therefore is not remarkable that the Fairphone as a niche product for modular smartphones seems to aggregate individuals with unconventional smartphone consumption desires. The quote further highlights the importance of technological features of the Fairphone but also that the person does not aim to place his or her smartphone on the same level as environmental and social wellbeing. Hence, it seems that sustainable products only have the chance to become mainstream and support people in behavior and attitude changes, as long as people do not have the feeling of minimizing their wellbeing and comfort but also want to contribute to environmental and social justice.

These statements above expose an understanding tied to the Fairphone that targets cultural and economic codes rather than political institutions. Participants consider their consumption choice as the basis for a path towards a change of consumer society and the economic system beyond the usage of a product. In doing so, it appears that Fairphone community members adopt new behavioral patterns and increasingly reflect on their broader consumption behavior.

Motivation of Fairphoners

While the evidence so far shows that there is a socialization as well as structural-connection function within the Fairphone community, which leads to shared beliefs and the adoption of new behavioral patterns, motivations for such changes are still missing. Closing this gap is important, since most research describes the phenomena that occur when people join a movement but do not explain the mechanisms of such recruitment (Cherry 2015). To enable a transformation of sustainability of all society it is crucial to display such mechanism of recruitment because they underlay possibilities for a motivation of so far unsustainable consumers. Moreover, many studies conclude that environmental and social concerns are rarely the only reasons people chose ethical products. In fact, it seems that a change in behavior is often driven and discussed in terms of the joy of the experience, the beauty of things and the decision for a particular lifestyle (Schoolman 2016). These motivations are in turn connected to the personal identity of individuals, which influences the development of a collective and shared identity within a group that is fundamental for social movement formation (Della Porta and Diani 2006). This collective identity is also part of the socialization function that builds the ground for a structural connection of individuals to collectively act together towards a change of contemporary consumption patterns. Therefore, these mechanisms of recruitment and motivations for sustainable consumption should be considered alongside the organizational and structural explorations (de Bakker et al. 2013) in order to disclose the agency of public and private interrelations in social movements.

As described above within the quotes of Fairphone community members, sustainability related aspects of the Fairphone are shared among community members as the main reason to purchase a Fairphone, but participants also seem to use these as additional aspects of self-expression and identity. A statement of a French participant, who supports the protection of the environment and criticizes prevalent consumption behavior as well as the economy at large, exemplifies not only this shared credo within the Fairphone community but also supports a tendency to understand Fairphone as a lifestyle movement. The user mentions Fairphone as a way to increase sustainability and as a solution to unsustainable (mobile phone) consumption:

> I don't see myself 100% ecological but I try my best. I have been concerned about these issues for a few years. I am concerned how humanity changed and how much we destroy nature. I don't want to be part of such a thing. I am aware, that today, you can vote in the form of your preferred way of life … I see Fairphone as a suitable solution to connect people and spread information in regard to mobile phone and the related environmental problems (minerals). But as I don't only want to criticize I also commit myself, like for example to non-profit organizations … (Fairphone community member number 518, as a response to the second open question).

Besides drawing attention to the expression of the transformative character of Fairphone and the self-expression towards a sustainable way of life, the respondent highlights the possibility to connect with like-minded persons via the Fairphone forum. The Fairphone is considered as a solution for the unsustainable development of humanity and the participant also mentions that she wants to exceed the articulation of criticism by actively participating in the sustainable transition of society through the Fairphone.

Many participants also articulated that they continually aim to improve their effort towards sustainable behaviors. They also consider their shopping behavior in regard to purchasing Fair Trade, organic products, and regional goods as a part of their lifestyle. Other practices like traveling or recycling behaviors are integrated within their description of their sustainability practices. Therefore, sustainable consumption within the Fairphone community clearly does not only concentrate on the Fairphone itself. Rather, some community members regard themselves as pioneers, which have the responsibility to encourage other individuals to advance their behavior towards sustainability:

> I try to live a less wasteful life than others (although I admit, I don't go as far as some people, for example, who have completely stopped eating meat). I figure that it is my duty to do more than the average, in order to encourage others to do better. If the average gets closer to my level, I try to do even better... (Fairphone community member number 292, as a response to the second open question)

Even though many activities people practice in their everyday life are performed out of habit without reflecting on their utility or efficiency nor on normative rightness (Schoolam 2016), it seems that within the Fairphone community a practical consciousness exists, as people reflect on their activities as well as the potential of these towards ecofriendly improvements. It also seems that this conscious behavior for the smartphone consumption spreads onto other practices of their everyday life (see chapter on “spillover” in this volume). Even though, it is not possible to say whether the sustainable concern existed before the Fairphone or occurred through the interactions within the community based on the data collected for this study; it is empirically evident that the Fairphone community members share a sustainable attitude.

> The more complex the world around us seems, the more important it is for me to integrate a "policy of little steps" in my personal environment. Many think that they couldn't change anything, but in my opinion, that's wrong. … To change things e.g., through renewable energies, the purchasing of regional and organic products and the support of initiatives like Fairphone … these are all things that are manageable on an individual level. I'd invest in forms of companies, which respect nature and improve working conditions, even if this means to pay more. … Well-being and sustainability are not contrary to each other (Fairphone community member number 725, as a response to the second open question).

This participant not only mentions a personal attitude but also goes even further by stating that her everyday choices are assumed as a form of politics to improve societal and environmental conditions. The person sees certain aspects of society as changeable at an individual level in a way that has impact on all humanity. Even though, the individual is aware that she needs to invest more energy and time to fulfill efforts towards sustainability. This engagement revealed through everyday choices is of outmost importance within a lifestyle movement formation (Powell 2002):

> …it is through enactment of values in lifestyle that the Vegetarian Movement succeeds in affecting change within other members of the movement, those external to the movement, and the larger world market. While collective efforts and news reports on the health danger of meat are also effective, it is individual lifestyle that appears to be a substantial means through which this social movement is achieving change (Powell 2002, 186).

To relate Powell's argument to the Fairphone it seems that the campaign of the Fairphone Company as well as the economic and political initiatives related to the Fairphone affect a wider public but that the individual choice of a Fairphone owner must be considered at least as equally effective. In this respect, the embeddedness in other social networks outside of the Fairphone community will presumably increase overall public perception as Fairphone users are assumed to communicate their knowledge concerning a sustainable smartphone to others. It further seems easier to start a conversation on sustainability with others, if persons can report on their everyday life experiences with their "sustainable" smartphone. Also, the prior quote of community member number 725 illustrates that change towards a goal of a movement is possible even by small steps in daily practices. Powell (2002) further specifies the relation between public and private movement strategies:

> public movement strategies would not have a great influence on one who is not already aware of a dissonant relation between their values and behaviors. One would be more likely to ignore such information since that information did not strike a responsive chord. (Powell 2002, 186)

Following this argument, a movement potential for the Fairphone mostly exists because community members already have been aware of the problems within the smartphone production process. By continuously communicating about their smartphones with other people, they contribute to the distribution of sustainable thinking on ICT and smartphones in particular. Even though not all community members will buy a Fairphone, at least the awareness of the related environmental and social problems will increase in general. In addition, it is well understood that people join collective action mainly because of interpersonal ties (Passy and Giugni 2001), which suggests that the Fairphone community bears enormous movement potential.

Overall, the data reveals that members of the Fairphone community share a core element of personal identity, namely the goal to enhance sustainability, and they feel they are part of a transformative process. Survey participants clearly identified themselves with the message they saw connected to the Fairphone. Some even felt a duty towards society and the environment to consume in a particular way in order to issue a statement towards the economy at large and political institutions to change current systems. Survey participants were convinced that single products like the Fairphone could have such an impact. In addition, the interaction via social media seemed to support Fairphone community members in developing such attitudes, values and form new behaviors (Table 4). The personal confidence of participants to affect a change towards the goal of the movement through a low threshold activity such as the change of personal behaviors might assure the transition from small-scale to large-scale processes (Passy and Giugni 2001) and could be one reason why lifestyle movements increasingly gain public perception.

Discussion

In this chapter, I have sought to build on the extant movement literature in order to include new technological developments such as ICTs. I have also sought to include the interests of movement scholars as well as expand case studies conducted in the area of lifestyle movements towards internet-based communities. The case of the Fairphone enlarges scientific debate on social movements in three domains:

First, ICT and other electronics play a marginal role in lifestyle movements despite their rise within mobilization processes (see Haucke, Pollex and Lenschow in this volume). The evidence revealed that the Fairphone enables a movement formation based on a product, especially since Fairphone community members expressed a behavior change in their day-to-day activities.

Second, while digitization is increasingly recognized within movement studies, online communities such as the Fairphone community have yet to be considered as potential social networks that enable movements. The findings displayed a socialization and structural-connection function for the Fairphone community that are of outmost importance within micromobilization processes of social movements. The chapter also outlined an occurring culture within the Fairphone community with the smartphone as a symbol to express membership within a proenvironmental group. Furthermore, sustainable products like the Fairphone are instrumental in helping individuals to express their identity and might even spread to social practices, which are not connected to the product itself. Similar beliefs and attitudes among Fairphone community members were visible in the open responses as well as standardized items, with nearly all survey participants articulating concerns of sustainability and consumption as being important.

Respondents revealed the importance of sustainability related attributes of their phone as a major reason for its purchase. Community members also articulated that the alternative approach of the Fairphone would lead towards changes of the contemporary economic system. These results then affirm the movement character of the Fairphone as the company has succeeded in drawing attention to its sustainability-oriented approach to enable a change in the smartphone market. Since consumers value these characteristics, Fairphone not only offers a product suitable for sustainable consumption but also encourages consumers to understand their potential power through consumption practices. With respect to collective action and identity as prerequisites for social movement formation (Della Porta and Diani, 2006), responses to the open items especially affirm a Fairphone movement with community members acknowledging a sense of collective action expressed in their purchase. The results point towards a micro-mobilization structure of the Fairphone based on personal relations, exemplified through a majority of Fairphone community members who acknowledged themselves as similar to other members of the Fairphone community. Therefore, social movement scholars need to transcend the traditional understanding of movement organization and acknowledge that social movements also appear around informal networks (Dobemig and Stagl 2015; Haenfler, Johnson, and Jones 2012; Laamanen, Wahlen and Campana 2015), for example, online communities. By drawing on the example of veganism (Cherry 2006), this study argues that the structural-connection function of social networks is of utmost importance within lifestyle movements and supports people in their ongoing adoption of environmental behaviors. Moreover, as habits are interwoven in the social context they occur, it becomes evident that this particular context should be modified (Neal et al. 2011). It is, therefore, necessary for a promotion of sustainable consumption, to offer new contexts to enable new habits (Verplanken and Wood 2006). The Fairphone online community offers such a new context. For instance, an involvement in the online community supports changes in the behavior of Fairphone users, which could be indicated through the longer useful life of community members' smartphones compared to the average. One reason might be the accessibility to information about resource requirements and working conditions within traditional smartphone industry (see Table 4); this encourages consumers to critically reflect on the duration of phone use. The survey showed that the material used for the production of smartphones and the connected environmental and social hazards are widely known within the Fairphone community. Additionally, community members help each other in providing assistance for self-repair (Meier and Mäschig 2016). As community members interact and communicate about their attitudes, beliefs and habits concerning sustainability, and in particular of smartphones, Fairphone has become a change-agent for social change towards sustainability. Survey results show that Fairphone is positively valued as an option to make a difference and is mentioned as a symbol of environmentally friendly circles. Also, in the responses to the open questions, Fairphone was commonly connected with personal and societal changes. This carries two implications: it seems that changes in consumption habits occur through the participation within the Fairphone online community, but also that the commitment to Fairphone does not exclusively involve the ownership of a Fairphone (Haucke 2017). Rather, online communities need to be acknowledged within movement studies as social networks upon which a social movement might occur.

A goal of this study was to open up new avenues for future research on product and internet-based lifestyle movements. Most consumer products seem to carry a symbolic meaning that often affects the decision for a purchase and its usage. This symbolism is of even greater importance in sustainable consumption as individuals are more willing to consume in an environmental and ethical context, when they see a greater chance of signaling, that is, that others will recognize their behavior. Products that may have a higher signaling potential, seem to deliver a greater benefit from association with pro-social behaviors (Hartmann and Apaolaza-Ináñez 2012), making the signaling potential of the Fairphone a viable channel for identity expression and group belonging purposes. Future research should therefore identify such signaling processes within lifestyle movement mobilization. Additional benefit could be achieved by the integration of anti-consumption movements such as zerowaste or minimalism, especially in regard to symbolism or the absence of it.

Besides the contribution to social movement studies, this study contains certain limitations:

First, the infrequent purchasing of smartphones might provide a limited basis for generalization to overall strategies of actions within lifestyle movements. The Fairphone, therefore, might then mobilize consumers who already identify with sustainability or related practices and already belong to such social networks. Further case studies could overcome this limitation by combining different sets of daily practices like smartphone consumption, food shopping, and mobility behaviors. In doing so, social practices that might differentiate according to frequency, investment and social context could be integrated to illustrate the interrelation of daily practices across social areas within lifestyles.

Second, since few survey participants connected offline with other members of the Fairphone community, the data does not indicate a development of strong personal ties (Table 4). Even though, a trend was observed that family members or close friends might also own a Fairphone, the data does not give any link whether these persons together decided to buy a Fairphone or one person influenced the decision of the other. Therefore, the present study observes a trend for online communication, which might indicate a tendency towards weak ties but there is also evidence for offline communication that might indicate strong ties (see Table 4). Future research could overcome these limitations through further case studies in the area of internet-based lifestyle movements.

Conclusion

The present study delves into the concept of lifestyle movements and tries to provide a conceptual bridge between the dualism of lifestyle and social movements by demonstrating that a group of individual actors not only consume smartphones in isolation, but that these actors can also engage with others on a broader social cause. By combining quantitative and qualitative research methods, a social movement potential for the Fairphone Company was found. However, rather than focusing on the political rationalities of the company—looking at organizational resources and strategies or entrepreneurial mobilization as common in social movement theories—my analysis was broadened towards the Fairphone community and investigated the link between company and community as well as interactions within the community. Fairphone encourages consumers to regard themselves as actors actively involved in the construction of the Fairphone product and the related meaning. This helps to generate a collective identity, expressed by shared values and attitudes. In doing so, Fairphone operates as a change-agent enabling collective action in encouraging a sustainable smartphone industry.

Fairphone is not simply one of many players in the smartphone industry, rather it is an intermediary actor providing options for civic engagement to its consumers through cooperation with NGOs and public media campaigns, its sustainability approach, as well as its online community (as shown in Figure 1). It therefore not only offers potential for activism within the company and to its consumers but also influences the broader smartphone industry and society. Hence, the conducted case study approach offers interesting aspects for movement research. For example, through the co-productive process of design, Fairphone broadens the concept of sustainability. It is no longer a concept that is provided by a company to the market with consumers only able to choose from available products. Rather, it is becoming a co-produced good, which not only involves services needed but also adds personal and social value to the product. Thus, it is not merely a smartphone but rather a symbol of a political attitude, and consumers voluntarily contribute with time, knowledge and efforts to the product.

Nevertheless, changes in behavior can only be achieved if they are repeated regularly in a new context. This not only involves the consumers themselves but also other actors like production companies and policy that can introduce mechanisms that bring about change. Therefore, sustainability efforts need to be nurtured within the technological industry. This can already be observed in the food market, where consumers' demand for fair traded and sustainable products influences production patterns; perhaps the introduction of a wider range of electronic devices with sustainable credentials will trigger changes in purchasing decisions.

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CHAPTER ELEVEN

CONSUMPTION FOR SUSTAINABILITY? EXPLORING SOCIETAL AND POLITICAL DYNAMICS IN DIGITAL SOCIETY

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Abstract

Sustainable consumption is a complex issue linking individual decisions, social structures, and policy. The process of digitization can pose challenges for individual consumption and political action but also holds the promise for new forms of consumerism. Although sustainable development has become a key feature of political action and lifestyles, sustainable consumption is still politically marginalized.

In this chapter, we analyze the gap between individual and political action by examining consumption movements and policy in the European Union. Based on the observation that consumers are primarily considered within the framework of a weak sustainable consumption perspective, we argue that there are political blind spots for a sustainable consumption policy. Concurrently, we see an increasing dynamic in the self-organization of individuals aiming to foster change towards sustainability through personal change.

The process of digitization has strengthened countervailing dynamics. First, though digitization is a driver for economic growth that incorporates notions of ecological modernization, the promotion of strong sustainable consumption approaches through public policy seems unlikely. Second, new models of economic production and consumption are emerging, e.g., sharing economies, which are facilitated by digital technologies and support citizen access to consumption information and networks. Third, digitization eases global connections between people enabling citizens to collectively

confront political elites through transnational engagement. Considering these features of digitization, we discuss the potential of political regulation and citizen-induced consumer movements to promote sustainable consumption. The central question is whether these dynamics are interrelated or parallel and independently evolving. Therefore, we investigate the mobilization of digital society and individuals becoming ecological citizens. Without neglecting the growing environmental challenges posed by digitization, this chapter explores the effect of digital technologies on sustainable consumption.

Introduction

It seems that ever since the 1972 publication of 'Limits to Growth' (Meadows et al. 1972), individual consumption patterns have played an integral part in policy agendas for sustainable consumption. However, scholars argue that despite the many attempts of European and global governance to influence knowledge or attitudes of consumers, no significant changes in contemporary consumer trends (resource-intensive consumption patterns) can be observed (Jackson 2005; Lorek and Fuchs 2005). One reason might be that sustainable consumption behavior and supporting policies are unlikely to gain footing in the spheres of markets or the state if they challenge the prioritized notions of growth. Thus, instead of transforming political and economic institutions to meet ecological limitations, the underlying focus on economic growth often forces environmental policies to fit existing economic paradigms (Brulle 2010). What follows, then, are constraints in formulating binding regulations and integrating new moral issues—like environmental impact—and non-economic needs into the process of decision-making (Melucci and Avritzer 2000). For example, general criticism of policy at EU-level targets the prevailing but weak discourse on 'green consumerism', which widely neglects the risks of so-called rebound effects. Criticisms further ignore that the replacement of traditional consumer goods with ethical ones does not also address resource overuse (Alcott 2005).

Although this discussion is anything but new in the European scientific debate, political resonance has been limited. Instead, we see an increasing dynamic in the self-organization of individuals, aiming to enhance sustainability by altering personal consumption choices (Micheletti, Stolle, and Berlin 2012) and building grassroots initiatives in the area of sustainability. Examples are the growing number of individuals practicing veganism or vegetarianism for ethical reasons (Cherry 2015) or the symbolic consumption of particular personal products like Fairphone (see Haucke in this volume). Other types of social behavior like urban gardening, sharing communities, as well as repair cafés are among the many examples of the new social dynamics in regard to the Commons (see Ostrom 1990).[1] This chapter intends shed a light on these recent developments. In particular, we ask what are some of the underlying mechanisms and structures that support individualized actions performed as political behavior in the context of sustainable consumption?

Our argument points to the dissemination of information and communication technologies (ICTs) and the emergence of transnational online communities that support the evolution of global networks of individuals connected under a shared goal like sustainability. Although important in the research on digitization, this chapter will not reflect on the technical implications of ICT tools themselves in terms of sustainability, i.e., neither on merits of automation nor on dangers related to e-waste or socially unacceptable production conditions in the manufacturing industry (Kostakis, Roos, and Bauwens 2016). Rather, we focus on the chances of digitized social interaction for sustainability. In particular, we examine the crucial role of the Internet and social media in facilitating new social dynamics, which in turn might foster new ways towards sustainability.

In a first step, our contribution focuses on the European Union (EU) consumer policy and instruments for supporting sustainable consumption. We are interested in the role assigned to consumers in the EU policy agenda on sustainability. Public policy offers a significant context for sustainable consumption as it might steer or enable (ecological) citizens. For example: buying sustainable products might be made easier through information-providing policies. On the other hand, public policy may refrain from imposing positive steps toward sustainable consumption and, following liberal principles, respect the individual freedom to also behave unsustainably. Our analysis aims to map such patterns in order to better understand the political context for the self-organization of consumers. With respect to self-organizing patterns, we distinguish between *conventional* bottom-up (e.g., interest representation by formal organizations in the process of policy-making) and *individualized* bottom-up processes (interest representation through individual action).

In a second step, our focus moves to the empowered and informed (ecological) citizen that increasingly embraces a modified understanding of the role of consumers as market actors. Central to their market activity is a reconsideration of sustainability in their consumption choices. Hence, this consumer type overcomes personal (e.g., habits, knowledge) and structural (e.g., dominant consumer culture, availability of sustainable alternatives and information) limitations that (strong) sustainable consumption faces (Isenhour 2010). He/she acts as a change agent, introducing new products and services as well as spearheading new lifestyles (WBGU 2011). What follows is our exploration into how the new self-understanding of consumers is turned into political action. While from a traditional political science perspective consumption is not defined as political behavior, we argue that consumption represents a form of political action (Stolle, Hooghe, and Micheletti 2005) and constitutes a part of social innovations in political participation “that are hallmark of a vibrant democracy” (van Deth 2014, 364).

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[1] ‘The Commons’ is a term introduced by Elinor Ostrom that refers to natural and cultural resources accessible to all members of society.

The third section argues that digitization is one cause for the recent evolution of new forms of sustainable consumption, which include new forms of social movements referred to as lifestyle movements. The final section summarizes the chapter and outlines future research and implementation strategies.

Consumers and their role in EU policy

The role assigned to consumers in EU policy varies to a certain extent across different policy areas. Mostly, consumers are addressed in the context of the creation and the functioning of the EU single market. Indeed, consumer policy in the EU dates back to the Treaty of Rome (1957) in which the European Economic Community formulated the goal to give “…consumers a fair share of the… benefit” provided by the creation of the single market (Treaty of Rome Art 85/3). Nevertheless, the mentioning of consumers (in the Treaty of Rome as well as in other EU treaties) was not intended to form the basis for an elaborated European consumer policy (Weatherill 2013). Rather, “the assumption of the original Treaty… is that the consumer will benefit from the process of integration through the enjoyment of a more efficient market… allowing wider choice, lower prices and higher-quality products and services” (Weatherill 2013, 4). Furthermore, due to the principle of mutual recognition each “member country is required to recognize the relevant laws and regulations of all the others…” (Mitchell 1999, 65) and national consumer protection laws delimiting the import of specific goods have to pass the test of non-discrimination. By setting standards and harmonizing rules, the EU established a set of consumer protections that guaranteed level playing field within the common market. In this context, first attempts to improve the consumer position were undertaken to protect consumers from wrongful information, health risks and to guard their economic interests (Joerges 1979). Therefore, EU consumer policy first and foremost regulates the relation between consumers and producers in the market (Rauh 2016). With the consolidation of the European integration, especially in the Maastricht Treaty, the EU affirmed the aim to protect consumers through standard setting and to empower consumers as market actors: "Policy measures to reinforce consumer confidence are, therefore, essential to economic prosperity and any additional costs for business are generally outweighed by the overall benefits for them or improved consumer confidence in the market" (Consumer Action Plan 1999-2001, 6). The legal status and legal protection of consumers (e.g., in the area of contract law) is one of the main goals within EU consumer policy (see e.g., Consumer Policy Strategy 2007-2013). Thus, the creation of opportunities for consumers to act freely on the market and to use their market power is a result of the integration of consumer policy into EU policy. In the next sections, we detail the opportunity structures available for consumers to act on the market to foster sustainable development. We first investigate how EU policy addresses consumers (top-down) before we turn to patterns of interest group advocacy (conventional bottom-up) for sustainable consumption interests.

Environmental and sustainable consumption policy in the EU

Following the consumerist turn in research and the increasing relevance of environmental protection in general, the EU started focusing on consumers not only in regard to the functioning of the single market but also from an environmental policy angle (Spaargaren and Mol 2008). Jordan et al. identify in EU environmental policy a shift "from industrial pollution control towards bringing about more sustainable consumption patterns" (2009, 161). This shift can be placed in the context of global environmental policy: With the Rio Earth Summit in 1992 the role of consumption habits "was identified as a major cause of global environmental problems" (Murphy and Cohen 2001, 3). Yet, in contrast to the dominant command-and-control type regulatory policy aiming to improve the environmental performance of producers, EU sustainable consumption policy relied only on *soft* policy instruments, mostly information labels, to address individual behavior.[2]

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[2] In general, policy instruments can be differentiated based on the level of coercion used to change behavior. While soft instruments rely on persuasion (e.g., information provision to persuade addressees of a healthy lifestyle), hard policy instruments rely on coercion (e.g., forbidding behavior). In the middle of this continuum of coerciveness we find economic instruments inducing the desired behavior through financial incentives or sanctions.

The introduction of labeling schemes and other elements of soft regulation tools corresponded to the turn towards *new environmental policy instruments* at the EU level after the first Environmental Action Program (1992) and desires of the member states more generally (Jordan et al. 2003; Wurzel, Zito, and Jordan 2013). Furthermore, consumers in EU environmental policy are framed as autonomous and rational, making individual choices undeterred by state preferences and thus playing an important role as free market actors.

In its central agendas, the EU follows a sustainable consumption approach that is linked to concepts like ecological modernization or green economy.[3] Within this approach the EU acknowledges the relevance of individual consumption and the consequences of unsustainable consumption patterns, but merely focuses on win-win aspects of sustainable consumption: the uptake of environmentally friendly products is expected to help protect the environment and foster sustainable development while simultaneously providing economic benefits (e.g., Spaargaren and Mol 2008).[4] In general, consumer policy is characterized by a *catch-all* character. Sustainable consumption is introduced as a complex issue impacted by many factors. EU policy, therefore, tends to be non-specific and not tailored for special groups (like an ecological citizen). Rather, it addresses consumers in general (Paterson 2008). Furthermore, the EU characterizes consumers as "average-rational" in the sense that consumers are expected to base their consumption choices on an assessment of costs and benefits, while consumption habits or other non-economic factors are not addressed. Therefore, the reliance on soft policy instruments to facilitate well-informed consumer choices—and in that context more sustainable behavior—fits the overall weak conception of sustainable development and the characterization of consumers as average-rational (Pollex 2017). Thus, the EU (viewed top-down) falls short of more ambitious goals linked to the idea of sustainable consumption promoted by the literature on the relevance of consumption behavior for sustainability.

The following section adopts a bottom-up perspective as we ask how consumer interest groups, as representatives of consumers in the policy process, deal with sustainable consumption. We want to know to what extent EU consumer policy, with an "average-rational consumer" at its core, is stabilized by dominant self-images of consumer groups or to what extent consumer and environmental groups offer new framings that might trigger stronger policies toward sustainable consumption.

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[3] The three relevant agendas are: Integrated Product Policy, Sustainable Consumption and Production Agenda, Single Market for Green Products Agenda. For more detail see Pollex (2017).

[4] For a critical assessment of green economy see Brand (2012) and Borel-Saladin and Turok (2013).

Consumers between market and sustainability

Democratic polity, not least since the participatory turn in public policy making (Jachtenfuchs, Diez, and Jung 1998), relies on citizens' input to the formulation of policy. Conventionally, such "bottom-up" processes build on interest organizations representing collective interests (in our case consumer interests). At the EU level, we focus on the two big interest groups dealing with consumer and environmental policy: the European Consumer Organization (BEUC)[5] and the European Environmental Bureau (EEB) (Bomberg 2007). Both organizations follow the goal of representing European consumer interests and address explicitly aspects of sustainable development and consumption. We focus on general aims of the organizations and their priorities regarding sustainable consumption policy in order to find out the level of correspondence with EU policy and its notions of 'the consumer'.

The EEB focuses on the EU Eco-Label as the main instrument to support sustainable consumption that delivers benefits "by driving both producers and consumers towards more environmentally friendly products" (EEB 2017a). While the organization is well aware of the role of individual consumption and its impact on the environment, there seems to be no room for the usage of stronger instruments to change individual behavior within the EU's environmental policy (personal communication with EEB representative 2017). Especially, the consumer's freedom to choose is a central objective in the Union's (sustainable) consumption policy. Thus, tax discrimination of unsustainable products or even a ban of those products is in oppositions to this goal. Therefore, and although in principle supportive of stricter policies, the EEB perceives it as unlikely that measures beyond soft instruments informing consumers are going to materialize in the current context of EU policy priorities (ibid.).

The European Consumer Organization BEUC, in turn, focuses on consumer protection rights and the risks of misleading information. Thus, the organization attributes responsibility for sustainable products and development predominantly to producers and the retail sector. While supporting the notion of a consumer's freedom to choose, the BEUC is also concerned that consumers may be overburdened by the "right" to make good, i.e., informed, choices (in almost every sector of everyday life ranging from insurance products to food). Therefore, it does consider the option of eliminating unsustainable products through political standard setting (BEUC 2017a). Nevertheless, for BEUC clearer information on products represents the important first step in consumer policy before using stronger policy instruments, which typically addresses producers rather than consumers directly (personal communication with BEUC representative 2017).

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[5] Bureau Européen des Unions de Consommateurs

The positions of BEUC and EEB both rooted in a framing of consumers as potentially disadvantaged actors on (complex) markets suffering from information asymmetry: consumers do not (in many cases) have full information about products or services, their environmental impact or consequences. Therefore, the first step is to provide consumers with reliable information. This position is linked to the concept of ecological modernization or weak sustainable consumption approaches, which suggest that more sustainable practices and solutions can be developed within existing market structures (see Lorek and Fuchs 2005; Cseres 2005).

To sum up, the representatives of consumers in EU interest intermediation operate within the same understanding of sustainable consumption as the EU Commission; there is no advocacy in favor of strong sustainable consumption approaches despite the EU's generally ambitious environmental agenda. Therefore, in the next section, we concentrate on consumers who are not formally organized as actors potentially pushing for social and political change in a new and unconventional 'bottom up' process.

The addressees: citizen-consumers

What follows from our focus on policy and interest group activities is a growing public perception that neither political nor market actions are sufficient to resolve sustainable consumption issues (Brulle 2010) or, even more radical, that these systems even fail to protect the environment (Stein 2015; WBGU 2011). Such public critique draws on widely accessible scientifically based studies on the unsatisfactory path of humanity towards sustainable development (e.g., Meadows et al. 1972; WBGU since 1993) and a growing media coverage on sustainability issues along with a rather sophisticated and elaborated reflection on the concept of sustainable development itself (Fischer, Haucke, and Sundermann 2017).

Additionally, we observe that current consumption patterns negatively impact the quality of human life (in general and of individuals), due to environmental hazards, and are increasingly incapable of satisfying people's needs. Thus, alternative approaches of strong sustainability, which focus on the reduction of overall consumption, have gained prominence. Examples are found in sufficiency and decommodification strategies, which essentially demand reductions of material and energy consumption and are connected to a new understanding of wellbeing. This new understanding is founded on an emphasis on social relations, and a mutual responsibility for human and non-human life, as well as civic engagement, as opposed to the traditional materially based understanding of human welfare (Jackson 2005).

Of major concern for our study is the (self-)understanding of consumers as responsible actors in achieving strong notions of sustainable consumption. While (EU) policies may facilitate behavioral change through soft, information-based instruments, critics claim that these instruments are too weak to ensure behavioral change, and even less capable to ensure change in the direction of strong sustainable consumption (Stein 2015; WBGU 2011). Accordingly, we now turn to conditions at the level of the individual consumer that trigger the self-restriction of consumption choices towards sustainability—in the absence of political restrictions. These conditions imply a self-identification going beyond that of a reactive consumer with a limited capacity for responsibility, towards that of taking radical (non-) consumption action, i.e., not restricted to the mere choice between ethical or ecofriendly and traditionally produced products (e.g., political consumerism, see Stolle, Hooghe, and Micheletii 2005; Holzer 2006; ethical consumption, see Dubisson-Quellier 2009). In particular, such individuals seek to create alternatives outside traditional economic relations like the self-production of goods (e.g., 'prosumption', see Ritzer 2014; Ritzer and Jurgenson 2010) or the foundation of start-ups grounded on concepts like sustainability (e.g., sustainable business models, see Prendeville and Bocken 2017; sustainable entrepreneurship, see Belz and Binder 2015). Dobson (2003) refers to such individuals as ecological citizens who act under a shared environmental responsibility due to the awareness of global, social, and ecological consequences of their own consumption choices. Combining all these theoretical angles, we follow Grabs et al. in defining a strong sustainable consumption approach emanating from the individual consumer engaging in "pro-environmental, sustainable behavior as well as collective practices and lifestyles that aim to redefine both the purpose and the underlying mechanisms of consumption, including the self-production of goods and services as well as the change of consumption infrastructures" (2016, 99).

Forms of strong sustainable consumption can become a driver for sustainability since they imply deep-structural changes in transport, energy, agriculture and other systems (see e.g., Geels 2011; van den Bergh, Truffer, and Kallis 2011; Fischer-Kowalski 2011; Vergragt et al. 2016 for detailed discussions on respective transitions). These fundamental changes call for social innovation and learning (Heimlich and Ardoin 2008), both processes being central to the new role of consumers. However, the leverage point towards a sustainable society is not individual consumption action but the association of single consumers to a collective of change agents providing opportunities for social learning. Social learning processes are of major importance in the context of sustainability because it is well understood that knowledge (regarding consumption) is context-bound and mostly grounded in everyday actions (Shove and Walker 2010; Warde 2014). Hence, individuals come together to form collectives of sustainable consumers and organize learning (of sustainable consumption habits) as a social process within media communities (e.g., in online fora or magazines) or communities of practice (e.g., urban gardening communities, regulars' tables and sharing communities) with the intent of leading to action (Heimlich and Ardoin 2008, 228). If such groups build strong social structures, they themselves provide the opportunities for civic engagement, social relations, and adopting responsibilities previously identified as sources of wellbeing.

Contemporary social movements and grassroots initiatives from the broad field of sustainability (see Haucke in this volume on Fairphone) are examples of people as agents of change. These initiatives question the interlinkage between materialistic growth and human wellbeing (Vergragt, Akenji, and Dewick 2014) and intend to transform contemporary consumption culture (Haucke 2017; Yates 2015; Wahlen and Laamanen 2015). In what follows, we elaborate on these contemporary dynamics in more detail.

Social movements and the politics of lifestyles?

Social movements enable the mobilization of individuals that connect with others under a shared goal (like environmental protection) and offer the opportunity to collectively articulate their grievances (della Porta and Diani 2006). In doing so, social movements have the power to build alternative worldviews and to introduce these views to the broader public aiming for their adoption by existing social institutions (Calhourn 1993). It is hoped that this public identification of societal problems and the proposition of solutions might place sufficient political pressure on political institutions or other systems of authority (Snow 2004).

Some political issues (at a national and international level) have become so diverse and complex that they span across sectors of conventional social movements: labor and human rights discourses, for example, often form common agendas and economic development may align with environmental causes (Bennett and Segerberg 2011). Movement examples can be found in the Fairtrade movement in regard to working conditions (e.g., Clarke et al. 2007) or the degrowth movement, which demands a reconsideration of the dominance of political and economic notions of growth (e.g., Demaria et al. 2013). These movements differ from classical forms of collective action usually captured in social movement theory in their local and decentralized action patterns. Thus, (non-) consumption is understood by (ecological) citizens as a form of politics expressed in everyday life (Stoll, Hooghe, and Micheletti 2005; Black and Cherrier 2010). These localized lifestyles, which are nevertheless oriented on a larger public good (Wahlen and Laamanen 2015), seem to be a blind spot in typical social movement studies, especially, since lifestyle choices in the private realm rarely come to the fore of collective public action (Baringhorst 2015, 19). Nevertheless, politically or socially motivated lifestyle choices (e.g., based on conscious consumption) share with social movements the aim to change society at large. In particular, consumption movements are acknowledged as a direct activism against the (mis-)behavior of companies and (mis-)developed economic notions of growth (Kozinet and Handelman 2004). Therefore, Haenfler, Johnson, and Jones (2012) defined these dynamics as *lifestyle movements*, which form a new type of social movement that comprises private and public forms of engagement in targeting everyday practices in an attempt to change contemporary society. These lifestyles are based on shared perceptions and objectives to challenge cultural and economic practices by the enactment of alternative practices for a wider social, economic or cultural change.[6] Fundamental here is an understanding of lifestyles as a set of practices, which individuals perform not only based on utilitarian needs but self-narratives of individuals, capturing one's self-understanding and image of the person they want to be (Giddens 1991).

Equally significant, the impact of these ecological citizens is not only theoretical but actually visible. Micheletti and Stolle (2007) as well as Dubuisson-Quellier (2009) found that sustainable consumption can change entire industries and markets if consumers force with their consumption choices an increase in the demand for ethically produced and sourced products. However, from a traditional political science perspective this market logic makes it hard to conceptualize consumption as a form of political behavior. The traditional perspective on political participation considers "citizens' activities affecting politics" (van Deth 2014, 351) and therefore targets political decision makers. However, ecological citizens confront cultural codes like consumer culture (Haenfler, Johnson, and Jones 2012) rather than political institutions and traditional civil society organizations (like the BEUC or the EEB). Yet, going beyond a traditional understanding of political activity, acts of consumption can be interpreted as political participation (van Deth 2014) voicing social concerns and (moral) motivations outside of the narrow political sphere. In light of widespread unsustainable behavior, sustainable consumption might be the expression of a social grievance within society in response to the political irresponsiveness towards sustainable development. As a consequence, citizens may develop solutions and most importantly put these into practice, mainly in a private realm (Stein 2015).

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[6] Haenfler et al. (2012) refer to various types of lifestyle movements that are not limited to a motivation of sustainability, but also can have religious origins. What they all have in common is, that they are not a fulfillment of personal goals but withhold a subjectively shared sense of social change.

In a nutshell: there appears to be a growing citizen perception that demands for a transition to sustainability are not being addressed by economic and political leaders—even to a weak concept of sustainability as currently prevails in political discourse and is mirrored in the soft instruments designed to prompt responsible consumption behavior.

The next section will detail the historical path of this political dissatisfaction channeled into new decentralized and privatized solutions that nevertheless amount to a collective lifestyle change towards sustainability.

The politics of lifestyles and citizens' political opportunity structures

Our point of departure for this section is a weakened state in the governance for sustainability. On the one hand, the rise of market-focused liberal economic policies that favor globalization imply a shift of power from politics to markets that grant increased power to multinational corporations and weaken traditional state structures (Baringhorst 2015). On the other hand, della Porta and Tarrow (2005) point to the emergence of transnational non-corporate collective actors in global politics. Transnational mobilization, in this respect, creates linkages between different social and political actors across nations, but also social and cultural groups. Beginning with the social movements of the 1960's and 1970's, we observed an increased politicization of society and the daily life going along with an increase in public negotiations of societal as well as individual aspects of wellbeing (e.g., gender and race equality, freedom and environmental protection). Social movement scholars refer to the spread of movement ideas, practices and frames—across nations and new groups (like consumers)—as diffusion (della Porta and Tarrow 2012). Both dynamics—

the empowerment of multinational corporations and the increasing global orientation of consumers—encourage citizens to voice their claims through consumption. Hence, consumers that sense a global responsibility might connect with other citizens in the light of shared grievances and address corporations rather than a single state.

While the diffusion of social movement practices like global protest may help to explain the politicization of individual wellbeing—including consumption behavior—scholars still need a better understanding of the movement tactics grounded in the everyday and thus contrast these to traditional social movements. Here, we can turn to McAdam (1983) or della Porta and Tarrow (2012), who emphasize the role of the larger political/organizational context like the organizational readiness and political opportunity structures at national and global levels. As reviewed above, in Europe (and probably elsewhere), opportunities for a strong sustainable consumption movement appear weak, both because of limited political readiness (given the market-oriented path set in the European Union) and because classical political opportunity structures offer hardly any entry points for alternative discursive ideas. Therefore, citizens replace traditional forms of political participation with informal and commercially oriented forms like consumption, which, although widely perceived as an individual act, can be considered a possible location for politically and morally shared concerns (Rebughini 2016). Social movements in general integrate needs, issues and actors that have remained outside of the political system (Melucci and Avritzer 2000). Especially consumption, as a low-threshold practice, might bear high potential for such integration. This potential responds to wider social developments like a decrease of the importance of social class (Melucci and Avritzer 2000), leading to a need for new identity processes. In particular, the notions of a consumer culture and society might release such dynamics because acts of consumption bear the potential to co-opt processes of identity formation and group belonging (Baurillard 1998) and can symbolize a particular lifestyle, attitude or value (Belk 1988; Haucke in this volume).

What clearly stands out is that sustainable consumption has grown on the heritage of previous social developments like an increase in individualization and the politicization of society, and, in particular, social movements like the environmental movement (Rebughini 2016). Especially younger citizens, who are without other political experience, consider consumption as a new form of activism grounded in daily life activities. Hence, an historical pathway can be seen from new social movements and the global justice movements since the 1990s to recent consumer induced movements emerging in a diverse and constantly evolving society

(Rebughini 2016). These developments are matched by historical changes in the dominant collective reference points, i.e., shifts from the representation of a social class in traditional social (labor) movements, to the belonging to different cultural sub-communities in new social movements (e.g., gender, race or environmental groups) and now to individually shared lifestyles.

Digitization for sustainable consumption?

We now turn to the question of the underlying mechanisms and structures that explain these new forms of political behavior, in the context of sustainable consumption, and point to the dissemination of ICTs. In fact, many forms of lifestyle related engagement and movements have become popular through the Internet. This can be observed both, with regard to environmental movements aiming at the protection of the Commons as well as to movements focusing on dietary behavioral change following ethical considerations. Also, types of co-production and open-access approaches may operate as online real-world-laboratories that influence the offline world (Mosca 2010; Borrero et al. 2014; see also Haucke in this volume for the co-creational process of Fairphone). They support the dissemination of unconventional practices like, for example, foodsharing as an alternative to typical market practices and consumer cultures in growth-oriented societies through a reduction of food waste (Wahlen 2017).

Especially, smartphones and digital media are related to real-world practices of sharing (Belk 2014) and a general change in cell phone related practices like charging and managing the power of smartphones (Bento 2016; Horta et al. 2016; Thulin and Vilhelmson 2007). Further, the Internet not only offers space for a newly evolving culture of sharing but also supports individuals in actively changing their lifestyle. Certain apps, for instance, aim to facilitate sustainable consumer choices, for example through barcode scanning or other additional information of particular products (Heidmann, Bauer, and Warth 2011). Also, alternative search engines like Ecosia offer, apart from traditional informational services support, the opportunity for users to actively contribute to the wider goal of sustainability.[7] Other examples are found in crowdfunding, where collaborative finance supports the development of alternative start-ups. These developments reflect feelings of solidarity in the self-reflexive act of identifying a common condition with a distant other (see Melucci and Avritzer 2000), which can be the basis for social movement formation. In sum, the gap left by interest group mobilization, which fail to change the (too) weak regulatory activity of the state (and the EU), is filled by the mobilization of individual consumers. This engagement in political consumption and the formation of lifestyle movements is mainly enabled by the possibilities offered through ICT technologies.

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[7] Ecosia.org is an Internet search engine that uses its earnings to plant trees.

We think it is worthwhile investigating to what extent ICT is also changing traditional patterns of interest intermediation, i.e., allowing political decision makers to engage more widely with consumers, thus widening access to new consumer voices. This chapter draws on the EU consultation process to get a first idea on the impact of digital media and communication on policy making. Consultation processes form a way to incorporate individuals and their positions into the rather complex process of policy making and thus seem promising for the incorporation of social or lifestyle movements. Ideally, every EU citizen can contribute to a consultation process regardless of organizational status and voice his or her concerns and policy preferences. Especially in the EU with its now 28 member states, online consultations in principle lower the bar for participation since individuals can contribute from their home using their personal computer or smartphone.

In the area of sustainable consumption, the EU conducted two consultation processes: one in 2007, prior to the formulation of Sustainable Consumption and Production Agenda (2008) and another one in 2012, in the context of the formulation of the Single Market for Green Products Agenda (2012). In the process preceding the 2012 Single Market for Green Products Agenda, a significant number of 111 individual citizens and 287 representatives of private or public organizations responded to the EU's online questionnaire (EC 2012). The consultation report found that the majority of individual citizens and environmental NGOs would appreciate mandatory information (e.g., environmental footprints for products) and even more coercive instruments, while representatives of producer organizations preferred voluntary information (EC 2012).

Clearly, there is a complex structure of interests articulating a broad range of possible options to influence consumer behavior. While we cannot yet judge what impact the introduction of online consultations will have in the evolution of EU consumer policy, EU scholars of interest intermediation draw critical conclusions. They point to uneven capacities to organize and uneven access routes to political elites, which are not easily repaired through consultation procedures. Therefore, high-profile actors and lobby groups (e.g., business associations or internationally established NGOs) are expected to remain more influential in these processes than individual citizens or consumers (e.g., Klüver 2012 and 2013). Furthermore, according to Bunea and Thompson (2014), the EU Commission's consultation process should be seen as a strategic instrument used by the Commission to generate formal legitimacy rather than as a genuine attempt to open up policy making to the public. Considering that citizens' calls for more mandatory and stronger policies have not (yet) been heard, we share the expectation that the soft approach in EU sustainable consumption policy will continue.

Finally, as elaborated above, even consumers and consumer organizations who are fully capable to articulate the unsustainable consequences of widely common consumption habits, face cognitive barriers with regards to the consumers' role and responsibilities to get strong positions of sustainable consumption represented. Examples might be found in food production systems and connected issues of food and packaging waste or the production of daily life products like smartphones (see Haucke in this volume). Given these deeply embedded cognitive structures, it is highly unlikely that mere consumer information and education will alter current consumption culture. It seems therefore crucial, that public policy approaches (top-down) support strategies of strong sustainable consumption, and that these strategies are implemented to encourage any progress towards sustainability. Isenhour points to the crux of the matter: "Without mutual cooperation, the contemporary focus on consumer responsibility and choice is not likely to result in significant long-term change—no matter how many people change their light bulbs or buy ecolabeled laundry detergent" (2010, 466). The question arises, "How to get there?" Especially, in light of the pattern of policy making referred to above.

The EU seems to have room for improvement in regard to citizen involvement beyond online consultations. A development of more promising methods to incorporate individual citizen positions into policy-making seems necessary. Especially, since highly involved individuals (and members of lifestyle movements) are to some degree experts themselves without having this formal status. Thus, their interests and knowledge can be important to policy makers.

Turning to the original question that animated this chapter: How is the new self-understanding of consumers turned into political action? Our answer is twofold pointing at digitization as opening new opportunities for sustainable development. First, digitization enables connection, information and co-operation of individuals. Thus, the formation of lifestyle movements profits from opportunities provided by processes of digitization. However, second, the formation of a lifestyle movement is surely just one aspect of fostering possibilities of connection and collective action. Also, with regard to participation opportunities in more traditional policy-making processes, digitization provides new opportunities for individuals. Nevertheless, there remain structural advantages for classical interest organizations since they provide not only input but also information and legitimation to the EU system (or other political systems). This aspect is connected to recent discussions of power in sustainable development and sustainable consumption (research) (Fuchs et al. 2016). While a change in consumption might translate into market power, it does not necessarily translate into political power. In the political arena, power still tends to impose ones will onto others (Weber 2015). Thus, some form of organization is required to organize and exert power. We see little evidence of a sustainable consumer formation in this manner.

Conclusion

Our study asked what underlying mechanisms and structures lead to an increase of individualized actions undertaken as political behavior in the context of sustainable consumption. Focusing on the European Union, we began with the observation that neither top-down policy approaches nor conventional bottom-up—that is interest group based—advocacy push very hard towards sustainable consumption. Instead, both favor weak sustainability approaches. At the same time, however, we also see an increasing number of 'ecological citizens', practicing strong sustainability approaches within their consumption habits and general lifestyles. Since globalization might limit the scope of traditional national regulatory approaches and corresponding limits to the scope of traditional social movement activities, conscious consumption choices may evolve into new forms of collective behavior and systemic change. Thus, consumption choices may become politicized and can be understood as individualized bottom-up advocacy, which aims at changing policy and society while bypassing traditional structures of interest advocacy in the policy process.

Underlying mechanisms contributing to the perception of consumption as a political activity are (1) the semi-constitutional role of liberal market policy in the European Union (Sbragia 2000; Joerges 2003) and globalization processes, which are empowering corporate market actors at the expense of nation states. Such market dominance at ideational and corporate levels is likely to delimit the cognitive horizon of the core political actors to policy options compatible with an economic growth paradigm. However, it may also invite protest by some. (2) With an increasing politicization of "everyday life," beginning with social movement formations in the 1970s, the private sphere gained prominence in the enactment of citizenship and consumption. Thus, formerly private acts like the purchase of consumer goods become intermediaries in the performance of the citizen's role. (3) The increasing volatility of classical group identities (like social class) opens space for other processes of identity formation like symbolic consumption. Finally, we suggest that all these mechanisms are supported by (4) the evolution of digital media.[8]

Especially benefitting from these developments are lifestyle movements, understood as new forms of social movements, which are based on shared lifestyles and comprise everyday life as well as public forms of engagement which aim to change contemporary society and identities. For instance, individuals seeking to change their habits easily gain access to corresponding information via social media sites and other information tools. The Internet further provides opportunities for individuals to connect with others and exchange ideas about alternative practices, not only addressing shared (political) concerns, but also capturing the image of the person they want to be. While we are fully aware that there exist negative aspects of digitization, e.g., security leakage of personal data, our focus lies on the potential for a sustainable development. Digital media may play a crucial role in overcoming bottlenecks in organizational and political opportunity structures in support of strong sustainability approaches. They may facilitate the formation of lifestyle movements and help ecological citizens enact new forms of political behavior and may open new political pathways for mobilized citizens to address problems and demand policy changes.

At the same time, the evidence presented reveals that the path towards stronger notions of sustainability and sustainable consumption is likely to be a long and rough one. For example, ecological citizens connecting in sustainable lifestyle (movements) still remain the-odd-ones-out in society and political responsiveness is still biased towards organized groups. In order to better understand the conditions that social practice and policy making converge in pursuit of normative goals that are not (yet) deeply anchored in society, further research is needed to explore the role of consumers-at-large and in different areas of consumption (e.g., different domains like food consumption or different political approaches dealing with consumer empowerment or protection). In short, why does policy limit consumption options in some areas (e.g., tobacco) while other areas are not addressed at all? In other words, how do culturally embedded notions of appropriate behavior impact processes of social and policy change?

Another field of research lies in the take up and the impact of new political opportunity structures created through digital media, like the online consultation processes in the EU. Evidence so far, indicates that these new pathways for advocacy are far from eliminating participatory biases. We could not fully discuss this perspective in this chapter, but it seems important to further investigate the relevance of individual advocacy and its perception by policy-makers. This is especially true for the current situation of EU politics where new ways to generate legitimacy are needed and looked for.

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[8] Obviously, digital media may facilitate also any other kind to social mobilization. There is no built-in bias for pro-environment or critical consumption movements. In that sense digitization facilitates mobilization at the dimension of process not substance.

Finally, lifestyle movements still play a minor part in social movement studies. Research aiming at empirical accumulation of evidence and theoretical consolidation is needed in order to understand variation and interaction of movement organization, identity and tactics, and (potential) political impact. The combination of these research agendas moving from analytical heuristics (Pollex, Haucke, and Lenschow 2016) to rich empirical data might lead us to better understand the social and political dynamics emerging in an age of continuing ecological challenge.

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CHAPTER TWELVE

THE ROLE OF SOCIAL MOVEMENTS IN SUSTAINABLE CONSUMPTION: POWER RELATED COGNITIVE PRAXIS

SATU HUSSO

Abstract

This study examines the sustainability movement's role in tackling the issues of power that are embedded in the discourses and practices of consumer society. This examination includes the power-related framing of knowledge practices, people's roles as consumers and citizens, and certain movements such as Degrowth, Carrotmob, and the cultural critique of consumerism. The data and evidence for this study is mostly gathered from groups in Finland, although the intellectual background and action networks of the groups are international. By taking a collective action approach to the concept of cognitive praxis developed by Eyerman and Jamison (1991), I find that the discourses and practices established by these particular movements, such as alternative economical discourses and consumer campaigns, were created to encourage people to adopt sustainable lifestyles and to engage in broader systemic change. I also find that the politicization of knowledge practices can reciprocally impact various actors with the responsibility to usher in a sustainable transition. In this way, social movements function as spaces and processes in which new knowledge practices are constructed and processed, and the conception of democratic participation is reconfigured. Thus, knowledge practices are essential for making alternative consumption choices as well as advancing broader institutional change.

Introduction

"Sustainable development" is a widely accepted strategy by which many governments and NGOs might frame their activities. However, critics state that sustainable development is narrow in scope, like greening businesses and politically accepted tools without considering a deeper change to consumerist lifestyles (Seyfang 2008, 43). It is commonly accepted that western consumption levels exceed the Earth's biocapacity, and the responsibility for this global, environmental inequity—a growing moral issue—-can be placed squarely on the shoulders of individual consumers (e.g. Lury 2011; Micheletti 2003). Thus, many studies consider the significance of the role of individual human actors in trying to change lifestyles and consumption behavior (Lury 2011, 211). European Union (EU), the Government of Finland, and environmental NGOs often offer information for individuals in the hopes that consumers with heavy carbon footprints will make consumption changes[1]. However, despite the increase in general environmental awareness, behaviors have not drastically changed (Spaargaren and Oosterveer 2010). Thus, the need to change consumption patterns in order to solve global socio-environmental problems remains, and the role of social movements is a weakly explored area of research. Spaargaren and Oosterveer (2010, 1892–1893) assert that many citizens feel disempowered in relation to transnational global politics and economics. Moreover, a large number of studies identify a lack of individual and consumer empowerment (e.g. Lury 2011; Micheletti 2003).

Although there are an increasing number of studies on participation through market places, they often ignore the role of social movements in transforming political action (Balsiger 2010). New social movements are important because they can alter the logic and appreciation of practices and thus foster knowledge-producing and alternative lifestyles (Melucci 1989). However, these alterations are bound with issues of power because they are premised on challenging the incumbent system and consumer culture, and in envisioning a new cultural mindset (Lorek and Vergragt 2015). Movements can also challenge the definitions of the foundations of social and political life (Casas-Cortés, Osterweil and Powell 2008). As such, social movements have the potential to realize a societal change toward sustainability at the micro level, and by molding social actors to realize a societal change on the macro level.

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[1] European Commission:
http://ec.europa.eu/environment/green-growth/sustainable-consumption/index_en.htm;
Ministry of Environment:
http://www.ym.fi/en-US/The_environment/Sustainable_consumption_and_production;
Finnish Competition and Consumer Authority: https://www.kkv.fi/en/education/and
The Finnish Nature League: http://www.luontoliitto.fi/en/.

This present study takes a collective action approach and examines the cultural role of social movements in striving to impact sustainable lifestyles and advance societal responsibility to address the challenges of climate change. In this study, I ask how social movements are tackling the issues of power that are embedded in the discourses and practices of striving for a sustainable society. In this examination, I hope to illuminate the cognitive practices engaged when social movements encourage people to construct their roles as consumer-citizens. These roles are crucial in establishing a change toward a sustainable society. This study builds on Eyerman and Jamison's (1991) understanding of social movements as forms of activity by which individuals create new kinds of social identities. They argue that social movements create knowledge by connecting everyday actions and larger societal changes. Eyerman and Jamison view social movements as processes that generate meanings.

In the next section I discuss previous studies in the field of social practice approach on social movements. Then I explain my research methodology, followed by findings, a discussion of results, followed by conclusions.

Literature review

There is important research being conducted on sustainable practices. The social practice approach sees a connection between agency and structures, and practices are understood as the building blocks of social life (Shove 2003; Huddart Kennedy, Cohen and Krogman 2015). This approach helps to link micro- and macro-level processes of endeavors toward sustainable consumption. Social movements play a key role in recognizing the practices that lead to mainstreaming sustainable behavior (Krogman, Cohen and Huddart Kennedy 2015). In this study I am interested in ways social movements encourage the adoption of more sustainable practices and roles as responsible actors. Spaargaren and Oosterveer (2010) formulated three ideal-type roles for citizen-consumers who decide to confront global environmental and climate change. These three roles correspond to forms of environmental agency, when people are mobilized to strive for a change: as environmental citizens, as political consumers, and as individual moral agents. The three roles illustrate the different dimensions of citizen-consumers and these roles are overlapping in a global modern World rather than making distinctions between "citizen" and "consumer." These three modes of commitment have effects at the micro and macro levels. Agency and the subjectivity of the citizen-consumer are critical parts of climate change policy, and the three ideal types are used to show the various ways in which the citizen-consumer can respond to global change.

Since the 1970s, political consumption has been on the rise and it has also been subject to various studies on how it can impact systemic transition. The concepts of political consumption and consumerism are often used synonymously. Nevertheless, Bossy (2014, 181–183) raises the need to make a distinction. Political consumption is a repertoire of actions that consumers can take in various contexts, but political consumerism is a critique of consumerist culture and an aim to bring about alternative types of consumption. Political consumerism refers to power relations in the market context and especially to the actions of people who make choices among producers and products with the goal of changing institutional or market practices (Balsiger 2010; Micheletti 2003; Spaargaren and Oosterveer 2010). Micheletti (2003, 182–185) divides the strategies of political consumerism into four forms: boycotts, buycotts, discursive political consumerism, and lifestyle political consumerism. Boycotting refers to abstaining from buying, whereas buycotting refers to intentionally purchasing a product for political, ethical, or environmental reasons. Discursive political consumerism is communication on issues and problematic ethics of products and production and does not require purchasing. Lifestyle political consumerism is about changing one's lifestyle, such as veganism or voluntary simplicity.

In this study, I am interested in the collective endeavors designed to usher in sustainable practices, hence I decided to use the Eyerman's and Jamison's (1991) concept of cognitive praxis that sees social movements as generators of new knowledge systems. Cognitive praxis does not exist automatically within the actions of social movements, but it is created in articulation and formulation of thoughts and ideas that movements might define in a society. For instance, social movements can change everyday knowledge into professional knowledge, providing new contexts for the reinterpretation of the latter (Eyerman and Jamison 1991). Cognitive praxis includes three dimensions: knowledge, meaning, and rules. Knowledge can be theoretical or practical, abstract or concrete, and professional or popular. Meaning motivates action and it includes ideals, values, interests, and emotions. Rules are socially accepted and sanctioned ways to act (Boström 2004); they refer to the law, but also to the social norms that guide established ways of being.

Knowledge-practices are politically meaningful, as the practices of knowledge are power-related in a way that social movements create new knowledge that can engage and encourage people to resistance and changing their thinking and habits (Casas-Cortés, Osterweil and Powell 2008). Therefore, according to a cognitive approach to social movement analysis, social movements are not primarily protesting against societal changes, but they are creating subjects and producing practices that nurture a reconfiguration of politics (Casas-Cortés, Osterweil and Powell 2008; Eyerman and Jamison 1991). Melucci (1989) sees social movements as challenging the logic of consumer society and politicizing every day actions, and in addition, by constructing alternative definitions of citizenship and consumers, social movements are affecting the boundaries of cultural and political normality.

Research method and data

My goal is to explore cognitive praxis through focus group discussion with movement activists, as well as by analyzing some of the texts they produce. The key actors of the Degrowth, Sharing and Moderate Workshop, and Moderation in Danger groups were recruited to join focus groups from 2014–2016. Focus groups were used to gather data because group processes can help to clarify the ideas and visions of social movements in a way that would be harder in a one to one interview (Kitzinger 1999). My aim is to grasp the mutual experiences, strategies and visions the movement activists construct, thus the topics of discussion were social movement strategy, views of the current state of sustainability, and future visions. Each focus group discussion took 1.5 to 2 hours from 4 to 6 movement activists, and the discussions were held in activist work places, homes, or in the side room of a restaurant. The data was mostly gathered from groups in Finland, although the intellectual background of the groups is international.

Analyses of movement websites and blogs—written from 2010 to 2016 and each consisting of 20 to 115 pages—will complete this study. As analyzed, the Carrotmob blog was written by the founder Brent Shulkin and other "carrotmobbers," but the group members in Finland were not interviewed because the group has not been active since 2014. Though inactive for some time, some campaigns of the Carrotmob (begun in 2008) still emerge occasionally, especially in Germany. There were Carrotmob campaigns in Finland during 2008-2014, but the data was not sufficiently available for this study.

I conducted content analysis of focus group discussions and movements websites and blogs; knowledge-practices can be studied by analyzing the texts, images, media, tactics, events, and other activities of social movements (Casas-Cortés, Osterweil and Powell 2008, 25). The ideal types introduced by Spaargaren and Oosterveer (2010) function as a conceptual point of departure for this analysis. The three ideal types refer to different roles, which can be mobilized and used as legitimate sources of power and can emphasize a different dimension of the role of citizen-consumers. This study does not take a comparative approach with these groups, but I will analyze them as visionaries of alternative paths toward a sustainable society.

Case study: Social movements

Carrotmob

The Carrotmob (*Porkkanamafia* in Finnish) is a movement that aims to solve environmental problems such as global warming and carbon dioxide emissions by harnessing consumer power in a particular way. It was founded in 2008 in San Francisco, where it organized its first campaign in a local liquor store. Campaigns have been organized in over 20 countries, but the most active countries have been the USA, Germany, and Finland. To carry out a campaign, activists organize themselves locally and decide what kinds of local companies they wanted to target. Then they organize a bidding contest among the companies and select the company that promises to invest the largest percentage of sales for ecological improvements of their business. Information about the bidding contest is shared on social media in order to mobilize consumers to participate in the event, which increases the sales of the company. After the event, the activists encourage and help the companies implement changes with the assistance of volunteer energy consultants. The Carrotmob also seeks to raise consumer consciousness regarding environmental issues related to consumption. For example, as an outcome of the campaign, companies have changed their lighting systems or have invested in energy-efficient refrigerators. Most of the campaigns have been organized in restaurants and local stores. (Carrotmob blog 2016.)

Degrowth

The origins of degrowth thinking date to the 1970s and the book, *The Limits of Growth* (Meadows et al. 1972). More recently, degrowth topics were reactivated in Southern Europe in the early 2000's by grassroots activists and academics. Since 2008, many actors, from individuals to social movements and academic researchers, have sought to politicize the economic growth narrative in order to contain the problem of production and consumption on the environment and human wellbeing. There is an academic association, *Research and Degrowth,* dedicated to research, awareness and events among degrowth advocates. Alternative viewpoints of reconfiguring economic thinking, production, and consumption have been offered, and there are theoretical and practical discussions concerning infrastructural change as well as institutional and alternative economic orientations to implement sustainable policies and lifestyles (Degrowth.org 2016). Degrowth emphasizes the ecological boundaries of the earth and locally anchored economies as a solution for economic crises and more sustainable development. Degrowth thinkers see perpetual economic growth as socially unjust and ecologically unsustainable, and as a cause of reduced happiness (Fournier 2008). The blog Degrowth.fi, which began in 2010, states that its "focus is on the cultural dimensions of degrowth and particularly on the contemporary practices of citizens, firms, and other organizations that may either embrace or resist the growth fetish." The core activists in my focus group are economists, academics and NGO workers in the capital area of Finland.

Moderation movement

Two groups that speak about moderation share the idea of questioning the growth and consumption paradigms. Moderation means seeking a simpler life and adopting the existential need to act in harmony with nature. I call these three groups—detailed below—the "Moderation movement" because of their mutual message. Although the groups have emerged individually, they have cooperated, for example by organizing seminars. One group, Moderation in Danger (*Kohtuus Vaarassa* in Finnish), founded in 2009 and still active, originates from an international forum for bio-economy experts in Northern Karelia (in Eastern Finland). During that forum, the group declared ten theses of moderation that critique the social system, environmental politics, and consumerism. Moderation in Danger organizes seminars that give a voice to academics, artists, experts, and other participants in civil society, who work on the issues of sustainability and critique growth. They also organize local events, such as a car-free day and courses in permaculture. The group also draws attention to the investments in the military over the wellbeing of humanity and nature, and the harmful effects of the mining and forestry industries.

Another "moderation group," Sharing and Moderation Workshop (*Tasaus- ja kohtuuspaja* in Finnish), was founded in 2010 in Salo, a town in Southwestern Finland, when a small group of people joined together to plan actions. The group consequently grew into a local movement. Permaculture, urban agriculture, and a pathway to post-growth society are often discussed in their seminars. This group has raised awareness in many fields of sustainable transition, and organized different events such as workshops, movie screenings and excursions.

The groups I categorize as the Moderation movement can be seen as nodes in global movement network. Within this group I also include other social movements and initiations that have raised similar issues, like voluntary simplicity, the transition movement, and *buen vivir* (Alexander 2011; Gudynas 2011; Transition movement 2017). People in the voluntary simplicity movement apparently reject consumerist lifestyles and reduce their material consumption for moral, social, and environmental reasons. Alexander (2011) argues that they do not frame this as a sacrifice or deprivation, but as a way to seek freedom and a wealthier life.

Findings

I used content analysis to examined visions, ideas, discourses, and practices in relation to the role of the consumer-citizen by organizing my analysis based on the three ideal forms of citizen-consumer involvement that divide the roles to environmental citizen, political consumer and individual moral agents.

The Environmental citizen. Environmental citizenship refers to the engagement of citizens in shaping the political discourses of sustainability (Spaargaren and Oosterveer 2010). In my findings much of the discussion raised by the three focus groups concerned agency, with respect to the politics of sustainability. I found that the most crucial questions directed toward social change were meaning-making and the construction of values with respect to democracy. I also found that in the work of creating knowledge practices, it is essential to question the notions that have been taken for granted and the definitions that are embedded in consumer culture and growth society. Moderation and Degrowth (DG) movements question the contemporary meaning of concepts like development, growth, economics, nature, democracy, and scientific knowledge. Democratic empowerment is the key cognitive praxis issue of the focus groups.

From my analysis I found that all the groups I studied did not limit activism to governmental politics, such as voting or demonstrations against governmental decision-making. The empowerment of citizens included democratic envisioning with the goal of engaging in campaigns. It appeared that empowerment allowed activists to sustain discourses, which are important for societal change. The Carrotmob encouraged people to reconsider their understandings of the democratic power of the citizen-consumer and the perceptions that concern business. The Carrotmob (CM) gave a voice to local organizers who share the reasons that drive them to action:

> I "carrotmob" because one day in the future, when humanity lives in zero-waste municipalities and [has] power grids [that] not only distribute energy but collect it from windy mountain peaks and waves crashing in the Pacific, historians will study where it all started. They will find, at some point, that in the beginning of the 21st century, a little niche was created in campaigning for a sustainable future. (Carrotmob blog)

I found that hope and imagining a better future are visible elements of Carrotmob's aim to abstain from means like boycotting, which they see as negative. All the groups I studied have positive prospects in their message.

The Moderation movement aims to deconstruct the language that cements understanding of development, the power of classical economics and economic growth. Moderation in Danger (MD) asks in their webpage:

> Is our mind occupied, colonized? Do we suffer from lack of meaning? The language of economics is not able to articulate the rich spiritual and mental meaning of forest. The language of forest is needed for that. How to be released from the colonization of mind? You have to see otherwise. People who see otherwise and act otherwise are needed. Let's take a suspicious view to the claim that development always brings something good, that new is always better. (MD website)

The Degrowth movement also has a strong emphasis on transforming the language that is thought to be occupied by hegemonic economic discourse. The group poses questions such as who has the right to speak about economics, how do they speak, and for what purposes. To deconstruct the language that diminishes space for other ways of seeing and being, Degrowth encourages people to use tactics such as participating in the economic discourse and molding it from within, engaging in immanent critique, defining the boundaries of economic language, and liberating economic language to practices beyond economics. Proponents of Degrowth argue that economic language usually focuses on self-interested action and growth that exceeds environmental boundaries. Degrowth advances its agreements through economic journals, seminars for entrepreneurs, and also by educating young economists and entrepreneurs. In this way, advocates of Degrowth participates in and change economic language. Therefore, it opens discussions about the roles of economics and its consequences on environmental balance and the role of politics in promoting economic growth.

Besides questioning the role of economics and consumption in culture, the groups endeavor to create an open political dialogue that aims to politicize the issues that are not considered to be the burning issues of today. Although politicization is central to the movements I studied, none of them wants to be connected to any political party, left or right, because they argue that the environmental issues are so urgent and vast that we do not have time to wait for a perfect consensus. The Degrowth movement is well aware of the difficulty of deconstructing the incumbent economic discourse, especially in the midst of an economic recession. In the focus group they said:

> But now we should sharpen what degrowth means. From the beginning, the slogan was "your recession is not our degrowth" … so now we have to be able to explain that the recession is not what we aimed for, and the degrowth narrative should tell that the growth is not everlasting, and it will be ending anyway, but how it will be received how policymaking maintains the requirements for an equally good life when the economy is not growing. (Degrowth focus group)

My analysis shows that degrowth in Finland does not seek to introduce any fixed ideology to follow, instead, it aims to find local solutions to solve the problems of perpetual economic growth. Primarily, the Degrowth movement in Finland hopes to create first a degrowth society that is willing to create a degrowth economy. They see that is important to create cultural and political will to understand degrowth-thinking and to build societal and cultural foundations before rushing to a new economic system.

The groups I studied challenge the boundaries and use of knowledge. The role of science arose within the discussions in the Moderation movement and Degrowth. Moderation in Danger accentuated that local people's tacit knowledge should be taken into account more profoundly in environmental planning. The tacit knowledge of local people should also be included when planning, for instance, in mining and forestry businesses, which have an impact on nature and wellbeing in Eastern and Northern Finland. The Moderation movement and Degrowth brought to bear the significant role of science and the consequences of positivist approaches in examining economically bound environmental issues, which can ignore the value of human wellbeing and local environmental and economic issues. Particularly, they maintained a strong collaboration with researchers who are seriously striving to solve environmental problems and who are open to popularize scientific research and discussions on questions that intertwine nature, economy, and wellbeing.

Local solutions were key objectives of all the texts and discussions I analyzed. Nonetheless, the cognitive praxis of the groups also links and crosses various issues of globalization critique, the environmental movement, and consumer choices. Despite the importance of local solutions and initiatives, comprehensiveness is a major concept of the Moderation and Degrowth movements as it shapes their cognitive praxis. The Sharing and Moderate Workshop focus group observed that comprehensiveness had not yet been given sufficient attention. Although the traditional environmental movements are doing important work, they concentrate on conservational questions, hence The Sharing and Moderation workshop calls for comprehensive thinking: .”..and there are wolverines and the like…but it is the wholeness: Which organization thinks about the wholeness?” (SMW focus group). Degrowth also raises it as a crucial topic in their blog: “The wholeness is the starting point, not the division of solutions” (DG blog).

All the social movements I examined aspire to augment their knowledge on the structural problems of the market economy and political system. Albeit the Carrotmob is expressing less comments on structural problems than the Moderation movement, Brent Shulkin states that the system has to be changed because corporate power is so strong that people do not have the ability to impact it: “I believe our economic system is afflicted by a design flaw, and I believe we can fix it” (CM blog). This argument emphasizes that the causes that Carrotmob raises have to be based on citizen initiatives. In my analysis of the blog, I found the Carrotmob arguing that campaigns do not need to be targeted solely at energy-saving goals as they usually are, but all ethical issues can trigger a campaign. They invite businesses to take any socially beneficial action they propose; they have also implemented campaigns to tackle social issues, for example, child obesity and social segregation.

The Carrotmob says that it is not arguing politically, but a close reading of the texts and audiovisual materials shows that it raises questions about citizen democracy. It declares that it stays away from politics, which it defines as “a nasty horse race” because it sees politics as impersonal and ineffective action. I see Carrotmob as having the potential to mobilize people who do not see traditional political participation as attractive or effective. Although the fun and ease of the Carrotmob is often emphasized, especially in videos and other visual materials, local organizers also blog about their motivations and the reasons to participate: “I am optimistic but realistic. I think it is a civic duty to advocate for a change of mentality towards environmental issues” (CM blog). Although some might say that the Carrotmob even consolidates the principles of market economy, participants all over the world share their motivations based on environmental causes.

Political consumers

All the movements I studied view consumer choices that aim to change institutions and structures as an important tool to act politically. Political consumption, especially buycotting, is a tool of the Carrotmob that turns a negative situation into a positive one by using market forces. The founder of Carrotmob says: "Businesses will do whatever makes them the most money. This is the problem. It is also the solution" (CM blog). He continues: "Let's think of businesses as if they were donkeys. Donkeys are stronger than people. When they're nobly pulling weight for people they can help us achieve more than we ever could without them" (CM blog). Thus, business is not an obstacle, but rather an enabling party.

The Carrotmob states that it is important to change knowledge and attitudes toward companies, which, as strong and simple "donkeys," can help people get their power back from complicated global markets and make companies listen. To conduct a successful campaign, it is essential to learn to understand the logic of markets. The Carrotmob writes that businesspeople are "normal people like us," and they act within the market system, which does not allow them to fulfill their ethical goals; thus, the system has to be changed. The Carrotmob's view on the situation is evidently a power-related issue reminiscent of David and Goliath. The Carrotmob nudges people to consider what they know about citizen responsibilities and possibilities. Overall, Carrotmob poses the question of whether people think that there is a change needed to impact businesses. The Carrotmob does not believe that business behavior will become sustainable by pressure from the government, which also has economic interests, nor from individual consumers who are unorganized and weak. The aim of Carrotmob is to empower participants and Shulkin sees an urgent need for change: "Corporations are just legal structures, yet somehow, even though there are seven billion of us humans, we currently have no effective counterbalance to the financial power of corporations. This must change" (CM blog).

The videos and photographs of Carrotmob frame campaigns as fun and easy as they present images of food, beer, DJs, and people chatting happily in a bar. However, the blog text strongly emphasizes restoring the power to the citizen-consumer and stripping it from the global market. Consumers are not framed as hedonistic or guilty of environmental degradation, but rather represented as routinized and habitual actors who make their choices within the limits of a market system. Carrotmob indicates that people have to buy daily consumer goods anyway—things such as cereals or toilet paper—thus awakening people to the fact that everyone is consuming, so everyone has the potential to impact environmental issues.

Carrotmob considers the campaigns targeting small local stores and restaurants as the initiation phase, which will be followed by more established campaigns targeted to global industries, such as Nike and Reebok. It aims to generate more value in corporate social responsibility and includes it in discussions about sustainability. Thus, Carrotmob can stimulate entrepreneurs who are not capable and aware enough to fully evaluate the scope of corporate responsibility.

Also, Degrowth and Moderation in Danger often point to the responsibility of companies and engineers:

> …companies have to participate (they can participate!) in the discussion of values. We can actually argue that value-nihilism and hiding behind the inevitability of market logic is unethical, and only joining the value discussion and value-based acting is ethical. Companies have to join societal discussions and support the creation of mutual ecological and social rules. (DG blog.)

Degrowth argues that engineers should be enabled to create more sustainable products. The Moderation movement opposes fast fashion—the quickly changing trends of an often unethical fashion industry—and claims a longer guarantee for products in order to fight against planned obsolescence. Moderation groups discuss and write about boycotting unethical goods, without mentioning any special products except for those of animal origin. They also write about the urgency of using renewable resources, but they also aim to question the role of the consumer:

> …for me it is very important to understand that we want to be citizens, not consumers… citizens that find out that we have all the power to do everything, what we can do, and to be conscious about these power structures and not to take part in them... so, it is an interesting and important question of power and democracy (SMW focus group).

Also, Moderation in Danger and Degrowth share the idea of finding practical and discursive spaces to act beyond consumer culture and to explore practices of anti-consumerism. Sharing and Moderation Workshop hopes that overconsumption will be seen as immoral in the future. The Moderation movement aims to deconstruct the premises of consumer culture, for instance by discussing the addictive character of advertising:

> The problem of advertisement is the psychological and spiritual influence on people in the way it affects behavior, but also how it pierces its way into our ideas of ourselves and others, and how it changes our ideas of the essential notions in life, such as aesthetic, moral, or sexual values, and the relationships between people (MD website).

Individual moral agents

The texts produced by the movements I studied, and the discussions conducted with activists address the role of everyday practitioners. Sharing and Moderation Workshop says that it is crucial to work with local issues that people can easily adopt: "The big issues should be connected to the concrete life of people living in Salo in order to get people to understand [them]" (SMW focus group).

Emotions are also present when mobilizing people. Most groups I studied have an artistic or spiritual dimension, and there are artists performing with many campaigns and seminars, and events are organized together with artists; it can be moving and memorable for those attending. Moderation in Danger said that "…although important, a sheer rational analysis of society is not mobilizing people" (MD focus group). Thus, the cognitive praxis of the movements I studied, has a creative aspect that can help people adopt the message of climate change and to reflect their own behaviors. For example, Sharing and Moderation Workshop has called people to discuss the photographs of butterflies that are very sensitive to climate change, Moderation in Danger shares ancient poetry to reflect on the human relationship with nature, and Degrowth cooperates with an art association that is working for ecological values and sustainability. The Carrotmob campaigns also have a performative tone, as there is usually live music in the buycott campaigns.

According to Degrowth, every practitioner's habits should be more visible. It aims to repoliticize more sustainable practices that are not currently at the core of the mainstream consumerist lifestyle or in political discourses:

> The everyday degrowth practices seem to exist and to be rich, but they are set aside in public discourses and the strategies of cities. Moderate life that combines urban and rural, should be seen as desirable, instead of seeking bigger and bigger industrial plants, stores… (DG blog.)

Some degrowth practices are: reducing working hours, participating in a sharing economy, communality, or advocating a basic income.[2] For example, avoiding flying and driving are seen as culturally challenging, as well as alternative ways of spending leisure time. Moderation Movement questions what is enough and can enough be recognized? For the Moderation movement, mindfulness is important in absorbing lifestyle change. Seeing the value of the natural and human resources and pleasures that already exist instead of constantly seeking new gadgets and carbon intensive holiday vacations. The writing of Moderation in Danger illustrates, that they think moderation as a state of mind that helps to change behavior:

> What about if you take your direction from advertisers and calm down: perhaps near you exist more pleasures than you have recognized. You can get saturated spiritually and bodily in many ways. Maybe the thing you are missing is moderation. Moderation gives space to thoughts. It saves your and nature's energy. Moderation is freedom from consumption addictions. (MD website)

However, some culturally and socially contextual consumption habits, for example, those bound with Christmas, are not easy to alter. Moderation in Danger says on their website: "We are missing moderate Christmas, which helps us to reach the true Christmas peace and joy of contact. The moderate Christmas is coming if we want" (MD website). Sharing and Moderation Workshop describes in focus groups their observations on the difficulties of adapting different consumption habits among work community or youth. However, their activists express positive evaluations of people's willingness to put sustainable practices into action. They mention the concept of cognitive dissonance and show some examples of being awake, reflexive, and conscious. Moderation in Danger emphasizes in their focus groups that the gap between information and action may cause anxiety, but it can be overcome with strong social support. Hence, all the groups I studied see a social aspect as crucial.

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[2] The Finnish government is testing a guaranteed basic income in Finland in 2017 and 2018. During the experiment, 2000 unemployed persons will receive an unconditional monthly payment. The experiment will run for two years. Source: National Pensions Institute, http://www.kela.fi/web/en/experimental-study-on-a-universal-basic-income?inheritRedirect=true (21.5.2018).

Discussion

To sum up my observations about environmental citizenship, I argue that instead of understanding environmental agency directly as environmental citizenship, the agency I observed are aligned more with sustainable citizenship. I will detail the distinction between environmental and sustainable citizenship below. The social movements I analyzed call people to take environmental agency that focuses on problems at their structural roots without underestimating the importance of social, economical and cultural sustainability. Sustainable citizens constructed by these movements are tackling the hegemonic economic discourse by deconstructing the taken for granted meanings and discourses, but also by reconfiguring citizen activism and practices. Barry (2006) sees the concept of environmental citizenship as limited to state-based practices that can neglect the economic, political, and cultural dimensions of sustainability. He introduces the concept of sustainable citizenship, which means broadening the environmental citizenship toward a more ambitious and challenging agency focusing on the political, social, and economic causes of unsustainable development. It includes but goes beyond environmental citizenship and requires engagement with the political struggle against market and state-based forms of inequality, injustice, and ecological unsustainability (Barry 2006). Spaargaren and Oosterveer (2010, 1891) view ecological citizenship as "participation of citizens in, and their orientations toward, political discourses on sustainable development," so I see that the definition of "environmental" could describe the actions and endeavors for environmental responsibility of the movements I examined. However, the concept of sustainable citizenship takes the comprehensiveness of meaning-making made by the studied movements into account.

In my findings, all the groups I raised the discussion on meaning-making of everyday political actions and the construction of values with respect to democracy. Deconstructing the language of economic growth and opening a dialogue to politicize new issues. Emphasizing the local tacit knowledge in decision-making and viewing the sustainability and environmental issues in holistic way was important for the movements I studied.

These social movements aimed to create political consumers that are able to utilize market logic, but also to escape penetrating consumer culture. My findings support the idea that sustainable citizenship requires an active personal agency to politicize the discourse and practices that concern sustainable development (see Spaargaren and Oosterveer 2010). The analysis shows that the attitude toward political consumption is twofold, but it does not divide movements as much as it seems to at first. The knowledge practices introduced by the groups create actors that are both political consumers and consumerists (see Bossy 2014). On the one hand, political consumption is perceived as a powerful tool to materialize a change if it is collective and wisely utilized. On the other hand, Degrowth and Moderation movements aim to escape the practices and discourses of consumption. Moreover, they mobilize people to question their roles as consumers and to deconstruct the power of markets and advertisement.

The Carrotmob speaks for buycott as a tool of political consumption, but it also aims toward a systemic change larger than just favoring a certain product or producer. A central issue is to become aware of consumer power. By a positive use of market force, Carrotmob can engage new actors to take responsibility on more sustainable production and consumption. Jaeger-Erben and Rückert-John (2015) see the Carrotmob as a social innovation with the potential to change social practices and stimulate sustainable development. Although Carrotmob does not change consumption drastically, it reconfigures the meaning of a whole network of evolving practices. It responds to the lack of collectiveness, participation, and solidarity. Heiskanen et al. (2010) studied the Carrotmob as a low-carbon community of social consumption that changes helplessness into empowerment and fun. They argue that Carrotmob reverses the conventional notion of sustainable consumption as a sacrifice for the common good and creates a new infrastructure of coordinated consumption.

Although it is not easy, one of the most powerful and radical political acts that an individual or group can do in modern, consumption-oriented societies is to refuse to consume (Barry 2006, 39). Moderation movement and Degrowth both question the logic of consumer culture and nudge people to consider their real needs. Cohen (2016) emphasizes that in order to understand consumerism as a system of social organization, it is crucial to deepen the understanding of the demographic, economic, social, and political bases of consumption and to comprehend how consumerism has become embedded into our cultural understandings and everyday practices. My findings support Cohen's idea especially in the way that the Moderation groups and Degrowth aim to deconstruct the hegemonic discourse of perpetual economic growth.

Particularly, the groups I analyzed do not focus solely on the individual consumer, but keep their discourse on the level of collective consumption and consumer practices as well. Thus, the movements I examined use political consumption is a repertoire to boycott or buycott several products, but they are mostly using political consumerism is a critique of consumerist culture with an intent to bring about alternative types of consumption (see Bossy 2014). The tools of political consumption vary between boycott, buycott, discursive political consumption and lifestyle political consumption (Micheletti 2003). I argue that the common goal of the movements is to involve various actors such as designers, entrepreneurs, and municipalities (besides individual consumers) in the strategy to create a sustainable society.

My findings illuminate how individual moral agents should be strongly fighting against cognitive dissonance. I argue that moral agency, which focuses on lifestyle politics, is strongly connected to avoiding cognitive dissonance, which refers to a situation with conflicting feelings, thoughts, and behaviors. Degrowth thinks that the depth of commitment matters most, that is to say, how people absorb ideas and realize them in their lives. Both Moderation groups see that mobilization needs to be reflexive, not an attempt to push participants into a certain direction. Every group I studied considers face-to-face meetings and discussions to be important for mobilization.

Lifestyle politics refers to the ways in which people reflect on their everyday lives and attach narratives of the self to their lifestyles and personal agency. Thus, changing habits often means de-routinization of practices that are performed at the individual or social level. In other words, reflexive (re)considering of practices and narratives indicates the attachment of the private (micro) level and the public and local (macro) levels of lifestyle politics (Spaargaren and Oosterveer 2010). Knowledge practices are a crucial component of the creative and daily practice of social movements (Casas-Cortés, Osterweil and Powell 2008, 19).

Hope and imagination were crucial aspects in the discussions and text I have examined. Therefore, it appears that the imaginary dimension and hope have not received much attention in social movement research, although they are important elements in modem social movements (Bossy 2014). The social movements I studied translate the meaning of everyday practices and larger societal changes. In this way they might help people to motivate their small-scale actions and also avoid cognitive dissonance between ideals and actions. In order to make people adapt to the seriousness of climate change and to engage in actions to change their lifestyles, it is important that knowledge is filled with meaning: ideals, values, interests, and emotions. By constructing alternative definitions of citizenship and consumers social movements are afflicting the boundaries of cultural and political normality (Melucci 1989), that is sometimes central in nudging more environmental behavior.

Conclusion

How do social movements create knowledge practices referring to the human-environmental relationship, people's roles as consumers and citizens, and the state of democratic participation? In this qualitative case study, I explored this power-related question by analyzing the texts of various social movements as well as group discussions conducted with activists. This study scrutinized the nodes of the network of the "sustainability movement" such as Degrowth, the Carrotmob, and the cultural critique of consumerism that Moderation in Danger and Sharing and Moderation Workshop are fostering. Instead of focusing on the household or individual level, I took a collective action approach to the case study by drawing from social practice theory and the concept of cognitive praxis in order to analyze discourses on civic engagement and conceptualizing knowledge practices.

To analyze the expressions concerning power relations and knowledge-making in the discourses of a social movement, I drew on Eyerman and Jamison's (1991) concept of cognitive praxis, which views social movements as sites of knowledge creation. Movements generate knowledge that is concrete, situated, and embodied. Knowledge practices are also politically crucial because of the inseparable relationship between knowledge and power (Casas-Cortés, Osterweil and Powell 2008). Changing behavior is not always easy because people act within society, its demands and values. Consumption behavior is influenced by social pressures and, thus, calls to consume differently are contextual and situated. Consumers are locked in to certain patterns of consumption that tend to reduce possibilities and are limiting (Seyfang 2008). Also Shove (2003) sees that the incumbent market norms and social norms influence the interpretation of actions considered reasonable and acceptable as well as the daily routines and norms that reproduce and reinforce these practices.

Stoknes (2015) writes that the issues have to be close to people to move and mobilize them. For example, melting glaciers are spatially far away and carbon dioxide is invisible, therefore these issues can stay at the abstract level. So, de-routinization of lifestyle politics and consumption practices are entangled with cultural appreciations and reasoning. My analysis reveals that the issues raised by these movements are intertwined with questions of freedom and power. They also create knowledge practices that reconfigure the concept of democratic participation and the citizen-consumers' capacity to envision another kind of society that is based on planetary boundaries. In addition, they also aim to encourage people to harness consumer power and to steer businesses toward more sustainable behavior. One of the major roles of the social movements I analyzed is to make people see the possibilities of implementing a change, not so much to offer a fixed ideology to follow. These social movements hope to mold social actors into being more reflexive and thus willing to de-routinize their ecologically harmful everyday practices. Therefore, acting as a moral agent includes both sustainable citizenship and political consumption.

The knowledge practices that the social movements have proposed are intertwining the micro and macro levels of sustainable change. It is hoped that knowledge practices create actors that take sustainability issues into account in all aspects of their lives. One focal point of these social movements is to produce and cultivate various political knowledges. All these cognitive knowledge practices tend to arise from the grassroots level but aim to change the larger social system.

Stoknes (2015) writes about positive and meaningful actions that can make environmental choices easier. In order to encourage people to change behavior, he suggests that the focus be on positive strategies to act as social citizens rather than merely individuals. It is also essential to make issues concrete, use supportive framings to avoid negativity, reduce dissonance by providing opportunities for visible action, and to avoid cultural and political polarization of issues. He argues, that positive narratives that show fulfillment and hope are working. I see the cognitive praxis of the sustainability movement as a cognitive territory where social actors and environmental agency are constructed and experimented with. Although the movement raises critical questions concerning structural flaws and power issues, it offers narratives of hope and discursive space for democratic visioning.

I find that the sustainability movement reminds society that consumption is not a concern for only individuals or families purchasing goods, but that it is a larger system that is culturally and bodily embedded. To conclude, I see the cognitive praxis approach as fruitful in studying a social movements' role in innovating and creating new practices, cultural signs and nurturing environmental agency. Although my focus group data was gathered in Finland, I would argue that the discourses and environmental issues raised by the groups can be applied to other countries with high levels of consumption.

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EPILOGUE

A SOCIOLOGY OF DISRUPTION

JEAN LÉON BOUCHER

In mid-June 2016, about 120 people—scholars, activists, and policy makers—from 16 different countries met in Orono, Maine—on the quiet summer campus of the University of Maine. We convened to present new research, discuss, and debate salient issues related to sustainable consumption. This present volume is a testament to that meeting: members and friends of the Sustainable Consumption Research and Action Initiative (SCORAI). It was in the weeks before this meeting that Philip Vergragt sent a general communication for people to take the lead on an edited text from the conference: I took the bait, and soon asked Jukka Heinonen to join me—to which I am happy he accepted as I could not have done it alone.

It is, in turn, possible to think of this volume as conference proceedings, with each chapter representing—what was at the time—a more nascent or mature presentation of a research project (collected here are revisions of the originals). Also, it is possible to view this text as entitled: a set of cases collected within a snapshot of time, cases reflective of topical leanings and the interests of scholars who—if I take license—are concerned about the present state of the planet and humanity's role in it.

Having such of a diverse collection of studies, it was challenging for Jukka Heinonen and I to frame them: to find a "common thread." This "framing challenge," in turn, contributed to the title—*case studies from the field*—as we tried to meet both "common thread" and market realities. These demands forced us to reevaluate—something we came to appreciate—this collection of studies within the context of the broad research field of sustainable consumption—a vague and diverse field. I use the term *vague* in a complimentary, liberal and spacious sense.

Promise or myth

Our reference to promise or myth is twofold: (i) a somewhat meaningless rhetorical device to attract attention and (ii) a critique of the seemingly dominant discourses within the field of sustainable consumption itself—an apparent dualistic parting of views (an effect of the dualistic mind?): "There is hope" versus "there's no hope"; the "sustainability glass" is half-full or half-empty; there's possibilities versus "not possible." In this text, we have not focused on answering such questions, though I will now weigh in, somewhat. On the one hand, Jukka and I could say we have no idea whether the research on sustainable consumption represents promise or myth—hope or hopelessness, but we would argue that with respect to the current human ecological footprint and the potential of reducing it, there appears to be little cause for hope. Even from our own research, and the evidence in this text, we could say that we do not really know what a viable—in practice—environmentally sustainable humanity might look like. How would it work? How would less toxic and more justly distributed energy systems function? How could wastes be systemically internalized, eliminated, reused, or disposed? How might the human species play a more "balanced" and less dominant role in the ecosystems of the planet? These are daunting questions, and planners and visionaries should be and are grappling with them, but for now I will set them aside for the present purposes of this text: a collection of new cases from the field.

Possibility

We acknowledge that a report of cases, in and of itself, does not deliver much scientific impact. We could equally refer to these cases as a collection of instances or even "cherry pickings," as in, "cherry pickings from the field." Such a pejorative title, though, would not encourage notions of promise or hope, as evidence from instances—absent deeper scientific inquiry—has limited generalizability. Nevertheless, the cases which make up this text do represent *possibilities* and all that possibilities may or may not portend. Moreover, in a world where possibilities seem marginalized by business-as-usual, they may represent shards of hope: not an empty hope, but potentiality.

Thus, the arising of *Carrotmobs* and businesses like *The Furniture Trust* are instances of possibility; there is possibility in *community-based resource sharing, intentional communities,* and movement-oriented products like the *Fairphone.* Possibility can be seen in cultural forms arising in Brazilian favelas and the social pressures embedded in a ubiquitous consumer good like the automobile. Even in the critique of metrics, measures, and norms—like the *low-carbon illusion of cities* and the *sustainable consumption of automobility*: there is critical space being created, something of a clearing where possibility can arise—something contrary amidst the burgeoning human project. All of these "cherry pickings" bear something of a promise, something of possibility, and especially in the dawn of this present dark hour, the reality of possibility, the seeds of potential, should not be dismissed. These initiatives in the field of sustainable consumption constitute scientific evidence: evidence of potentiality, even if weak.

The limits of voluntarism (the structure/agent problem?)

When I use the term *voluntarism*, I am simultaneously referring to two things: (i) personal agency—the proactive individual and (ii) its referent self-evidence: the somewhat popular tendency—intentionally or nonconsciously—to refer to the micro-individual as a key agent of change—whether social, technological, political, economic, cultural, historical, or otherwise. This referent tendency has occupied a fair portion of this text. For example, in the way individuals may soon arise and join Carrotmobs or intentional sharing communities or start innovative "green" businesses. It is surmised that individuals will seek to bind together, socially, as a counter-cultural or counter-economic force, but firstly, somehow, voluntarily, they will independently choose the "right" phone or car (or no car at all) and they will seek to reduce their own carbon footprints, whether in rural or urban areas: they will do this in freedom, with liberty, by their own volition.

Even as I write this, it sounds appropriate and commonsensical: if individuals do not change or initiate change, how will it happen? Who else might do it? As a corollary to this notion, I cannot help but ask: Has humanity then, in myth or reality, directly or indirectly, finally achieved a constituent component of the Enlightenment? The ideal of individual rights and citizenship, democracy and equanimity, through rational thought and modernization? Are individuals as citizens, then, now positioned as the primary political units of change, guiding governance and a nation-state "of and for the people"? Are persons presently endowed with their own rights and working toward a common and just humanity, fraternité?[1] Extending these questions: How could such a development be reconciled with the current human-environmental crisis? Was the individual unaware of these accumulating ecological impacts or somehow in accord and complicit? Or is it too much to ask of the modem political agent to be responsible for such grand and historically aggregated phenomena?

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[1] Another component of Enlightenment thought did not so much reduce emphasis on the individual as shift its hierarchical positionality onto the "good-Monarch" or "philosopher-King," but such notions not withstanding attempts at tyranny and despotism seem to have drifted from present-day "modern" thought.

When considering such questions, I cannot help but think of the prescient critique of the late Ulrich Beck (2007): that the current human-ecological crisis is not due to the failures of modernization, but its successes, or what Beck (1998) called *organized irresponsibility*.[2] Thus, the target of Beck's (1998) critique was not the individual, but its institutions; and though these institutions may be made-up of individuals, the sociological wager is that individuals are not so much independent actors as carriers of social processes, cultures, norms and rules. Moreover, it seems this emphasis on the individual, or what some have called *individuation* (Giddens 1991)—the atomization of responsibility—has somewhat backfired in light of its connections to what Giddens (1991) labeled the *juggernaut of modernity*—the overwhelming mass of globalized, self-perpetuating social structures and agents careening toward nuclear holocaust and global ecological collapse.[3]

For Giddens (1991), the more a person makes informed decisions, the more they individuate (Giddens 1991).[4] Relatedly, with respect to personal consumption, Szasz (2007) identifies an "inverted quarantine": the self-protection, insulation and isolation from perceived threats, and the adoption of a general, if not unspoken, mindset of reflexive self-management. A technique where an individual is determined to stay "well informed," make appropriate consumption decisions, while sealing oneself from harm, complicity, and blame—what some have called the *consumption fallacy* (Altman et al. 2008). Similarly, Hawkin (1993) and Maniates (2001) argue that such individual attempts amount to illusory half-measures which sidestep the real issue of concentrated power amidst corporate and state elites who continue "cranking the rotary of consumption" (Maniates 2001, 43).[5]

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[2] For Beck, *organized irresponsibility* is an idea that "helps to explain how and why the institutions of modern society must unavoidably acknowledge the reality of catastrophe while simultaneously denying its existence, cover its origins and preclude compensation or control" (1998, 18).

[3] I suspect that for an archeologist, ecological collapse is not something out of the ordinary.

[4] Giddens (1991) additionally posits that in order to divert themselves from the pressures of modem risks and the loss of pre-modern meanings, individuals routinize their worlds and take ontological refuge in their routines.

[5] Furthermore, Maniates (2001, 57) asserts that the mandates like "think globally, act locally" are guilt shams that individuals should not bear. He claims it is no coincidence "that as our collective perception of environmental problems has

This is not happy news for the individual, this self-delusion, but if valid—this impotence in the face of a careening juggernaut, then I think it is best to confront this impotence with the goal of discerning effective ways through it—though this may be a heroic task and not for everyone.[6] Furthermore, with respect to sustainable consumption, individuals are more than just consumers—even if daily life may be dominated by single-dimensional economic concerns (Marcuse 1964). In other words, there are other dimensions—socio-political—by which individuals may deploy their agency, some of which are cited, cherry picked, in this text.[7]

As I am in accord with the views of Giddens (1991), Maniates (2001), and others (Altman et al. 2008; Hawkin 1993), I am reluctant to offer illusory advice. However, I do believe that the mainstream consumer, at this critical eco-historical juncture, could use a jolt of courage, creativity, and camaraderie—alternative camaraderie: as a wise old friend of mine, a Carmelite priest, is fond of saying, "If you want to live an alternative life, you need an alternative community." In other words, doing things alone may at times be necessary, but will probably not endure. There is the inertia of daily life to overcome, the "ordinary" challenges, like a scarcity of time and incentive, and having likeminded others may be necessary to motivating oneself. I would also add that people may be plagued by their freedoms, which provides them with the capacity to pollute and do harm.

Birds of a disruptive feather

As already mentioned, I feel that the "individual" is in need of a necessary corrective: people are less individuals than the bearers of social processes. This may come as a blow to the individual ego—which may like to think it freely makes informed decisions, but even the quest for alternatives (i.e., behaviors, ideas, communities) can be influenced by external others. Moreover, alternative influences, as the name implies, are generally positioned in contradistinction to more dominant, mainstream influences/culture: what some would call an authoritarian culture (Adorno and Horkheimer [1944]2000), a tyrannous culture. As several scholars in

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become more global, our prevailing ways of framing environmental problem solving has become more individualized. In the end, individualizing responsibility does not work...." (2001, 57).

[6] This reminds me of healing strategies from 12-step programs: acknowledging one's powerlessness is the first step toward addiction recovery.

[7] To complicate matters, I will argue that aspects of "survival" are socially constructed and relative; in other words, one person's survival may be another person's abundance.

this text have argued: identities—i.e., the individual ego—can become entangled in material culture, where goods and products are seen as reflections of oneself.

The careening juggernaut, then, is multidimensional and multidisciplinary: not only a material consuming entity, but also a cultural and psychological one. This, in turn, complicates its "juggernaut-ness" and any attempts to dismantle it will require an integrated, multifaceted approach. Unfortunately, this multidimensional juggernaut has been in-the-making for a few hundred years (at least) and it might be said that through its origins and historical trajectory it has developed a resistance to change. Therefore, any changes desired, once again, will require heroic efforts: from individuals, governments, institutions, cultures and more.

Perhaps to the disappointment of my reader, I do not have innovative solutions to the current human-environmental dilemma—in fact I sometimes think that people who use the term "solutions" have not properly grasped the fullness of the current—wicked—problem (Rayner 2006). However, as a sociologist there are insights from the discipline that I can share. First, as individuals will be reading this—and not institutions, these individuals should recognize that they are the product of cultural and institutional processes; for instance, in the different roles they play; in their ways of consuming; in their different positions/positionalities in hierarchies and civics. In this respect, individuals have some power, perhaps small, to disrupt taken-for-granted—business-as-usual—processes in the different dimensions of their lives.

In this vein, I am reminded of a story told about Frederick Douglass—the U.S. abolitionist, orator, and civic leader. Near the end of Douglass' life, a young black man asked what advice he would give to a young negro just starting out in the world, and Douglass replied, "Agitate! Agitate! Agitate!" (Holley 1948, 41). Likewise, my advice to individuals of the Anthropocene would be similar—Disrupt! Disrupt! Disrupt!—and all along the many culturo-institutional hierarchies. Wherever one may find oneself, whether dishwasher or developer, child or CEO, there are places where the cultural envelope can be pushed or nudged or breached. These may be marginal disturbances—to both others and ourselves, but I think that every little bit helps, even if we only express or act-out some resistance. Of course, disruption is better in a group, an alternative group, like a Carrotmob, but in the meantime… disrupt what little we can.

Another bit of psycho-sociological insight is that taken-for-granted, self-evident processes are often—by definition—entrenched in social silences. For instance, discussing the issue of climate change may not be politically correct as someone might not want to feel as if they are moralizing over others. Accordingly, this dynamic which spurs a reluctance to engage issues in public has been referred to as *socially organized silence* or even *denial* (Zerubavel 2006; Norgaard 2011; Geiger and Swim 2016). However, my description of this phenomenon has been overly rational and consciously intentional whereas social silences are often tacit, unacknowledged understandings that certain issues are not to be discussed. In the words of Bourdieu (1984, 424), "the ordinary acceptance of the usual order which goes without saying and therefore usually goes unsaid." A first step then toward social change, a critical step, is disruption—and make it visible and audible: disrupt the social process of silencing, and along the way, network with disruptive alternative others. So, here's my sociological advice, find some community and find some courage, perseverance and patience as our journeys will probably be uphill (if we are paying attention and not tacitly participating in social silencing).

There is an important caveat though: when change happens, as part of the "fall out," there are generally winners and losers. So, some people may celebrate disruption and others fear it, as they will suffer from it. There are many people who depend upon this present deeply embedded unsustainable culture and economic system and, therefore, if possible, provision should be made to cushion the blow on the "losers."

Freedom as problem

I also see "freedom" as an issue. With respect to my own research it has been something of a shock to feel that I have come up against the Enlightenment—the human quest for freedom from tyranny—and to find that freedom has become something of a power to pollute and degrade one's environmental surroundings. Like the arguments made by Haucke, Pollex, and Lenschow—in their chapter on *Consumption for Sustainability*, hard/strong policies are in order because relying on individuals to constrain their own consumption habits has not proven to be a viable strategy. Some people can restrict themselves, but it seems they are few, like those few who might voluntarily live in intentional communities. This dynamic of freedom—lack-of-green-voluntarism—is also present in the income-carbon relationship, identified in the chapters on cars and cities, where income is identified as the main driver of consumption and carbon footprints. In this instance, then, it might sadly be said that, "poverty is good for the planet." People who are constrained by income do not have the capability, the power, to consume more than the limitations of their income. They are also presumably *freed* from the temptations to consume more (Gatersleben, Steg, and Vlek 2002). Therefore, strong policies of constraint are necessary to corral a hegemonic consumption culture that has for many centuries prized and sought its freedoms from constraint.

I will leave this epilogue here, in a call to arms: for all of us to struggle with these ideas and realities of necessary restraint amidst limited abundance. I hope, then, that readers might learn as much as I have from this collection, and I believe I speak for all chapter contributors when I say that we are happy if we have been helpful: if people might collect and spread the messages in this text as we all go forth and fight for a sustainable future.

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