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The ecological footprint of green and brown consumers. Introducing the behaviour-impact-gap (BIG) problem

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Abstract

Despite increasing awareness towards environmental problems, and social norms more and more obliging individuals for environmental actions, there is too little difference made on the ecological impact level. Contextual factors apparently extinguish some of the behaviour induced ecological effects. The research described herein scrutinised the impacts of individual environmental actions on sustainable consumption by focusing on an assumed behaviour-impact gap. It raises the question how much of a reduction in carbon footprints can be achieved by merely increasing the environmental awareness of society without actually affecting the socio-economic system. Are voluntary actions sufficient to spur ecological improvements or are more fundamental changes in the foundations of society essential? An empirical analysis is carried out in order to measure the difference between the environmental impacts of consumption by 'green' and 'brown' consumers. The methodology combines a top-down environmentally extended input-output analysis with a bottom-up approach based on a representative survey. The research found no significant difference between the carbon footprints of green and brown consumers suggesting that individual environmental behaviour does not always modify consumption patterns significantly. Consumers offset the impact of their environmental behaviour by consuming more.

Keywords: ecological footprint, awareness gaps, sustainable consumption

Introduction

Better sustainability policy is supposed to lead to better sustainability performance. Nonetheless, recent research predicts further growth of the ecological footprint and an ongoing ecological deficit in Europe and North America despite their impressive policy efforts (Lenzen, M et al. 2007). Similarly, individual strategies result in somewhat reduced environmental loads for committed consumers but this reduction cannot offset the total impacts of the current socio-economic configuration: consumers in higher income countries tend to pollute more. A radical change assumes a change in lifestyles (Shove, 2003). The study described herein aimed at measuring the significance of attitude elements and comparing them to the significance of the present socio-economic system for different elements of consumption and environmental aspects.

There are many popular calculators available to measure the impact of individual consumption patterns on the ecological footprint (e.g. the ecological footprint published by the Global Footprint Network, Best Foot Forward, the Redefining Progress calculator by Berkeley University, the ecological footprint calculator from the Ministry for the Environment in Austria, etc.) They show tremendous potential to reduce the footprint through individual efforts. Is this potential actually achieved – or is it swallowed up by rebound and backfire effects? Do people with high level of awareness have lower ecological footprints? Do we have a workable conception of effective "environmental behaviour"? Or are we focusing on marginal actions while missing the real targets?

There are no empirical papers as yet which measure the significance of attitude elements as compared to those of the socio-economic system. This paper raises the question how much of a reduction in carbon footprint can be achieved by merely increasing the environmental awareness of society without actually affecting the socio-economic system.

II. The gap between attitudes and action

A number of studies has already addressed the gaps between the components of environmental awareness.

Kollmuss, A. and Agyeman (2002) found demographic factors, external factors (e.g. institutional, economic, social and cultural) and internal factors (e.g. motivation, pro-environmental knowledge, awareness, values, attitudes, emotion, locus of control, responsibilities and priorities as significant for environmental pro-behavior. Increased environmental awareness did not necessarily lead to pro-environmental behaviour.

Zsóka (2005, p.5.) identified five components of environmental awareness based on applicable research literature: ecological knowledge, environmental values, environmental attitudes, willingness to act and actual behaviour." (Zsóka, 2005, Rokeach 1968, Sear et al 1985, Hofmeister-Tóth, Törőcsik 1996.). A number of studies suggest that there exists a gap between environmental awareness components "due to the complex nature of reality and several influencing factors" Consumers with a high level of environmental awareness may not act sustainably.

According to Sanne (2002), consumers are locked into unsustainable lifestyles (e.g. by social norms) even though they are not willing and happy to act unsustainably. He argues that consumers may not be so keen and willing but are rather locked-in (to certain

behaviours) by circumstances. Thogersen (2005) lists societal infrastructure, available product and service alternatives, constraints determined by nature and scientific uncertainty among factors which constrain consumers in choosing their lifestyles.

"Some of these circumstances are deliberately created by other interests, and a policy to limit consumption must look for adequate means over a large and varied field". "Although individual consumers … have some discretionary power over their consumption pattern … limited abilities and restricted opportunities in combination with norms and incentives … make it difficult even for highly motivated individuals to do anything radical to improve the sustainability of their lifestyles" (Thogersen, 2005). Jackson (2005) argues that changing behaviours is difficult, because individual behaviours are deeply embedded in social and institutional contexts.

Hobson (2001) found that environmental awareness campaigns are not effective in promoting the public uptake of sustainable lifestyles. Policy cannot simply eliminate a wide array of social concerns. Hobson emphasises the importance of uncovering why actions and awareness are not always related.

This article goes even further and asks whether pro-environmental behaviour does actually result in a reduction in ecological footprint? The question may sound awkward, not yet scrutinised in-depth, but already touched by several authors.

Barr et al. (2010), for example, studied the travelling behaviour of citizens. They found that environmental attitude is a significant factor in choosing travelling modes in everyday life, but not for holiday travel. The latter is much more influenced by socio-economic conditions - leading to a conflict between personal values and societal expectations. Many studies found that ecologically concerned consumers belong mainly to the upper social classes. (see for example Balderjahn,I. 1988) Does it equal with saying „enrichment will ease the burdens on the environment? Not, if rebound and backfire effects are also effective at the level of individual behaviour and swallow up the achievements reached.

Fuchs and Lorek (2005) urge a switch from an efficiency based weak sustainability approach to strong sustainability that requires major changes in the lifestyles. Understanding the potential in voluntary environmentalism in that change compared with the socio-economic determinations is of vital importance. While voluntary environmentalism is compatible with the neo-liberal economics and the assumption of consumer sovereignty, this is not true for changes to be made in the socio-economic system, which explains failures and deficiencies in sustainable consumption policy. "Sustainable consumption runs counter to dominant tenets of neo-liberal economics and conventional political objectives." (Cohen, p. 67)

Guagnano (1995) developed the ABC model of attitude, behaviour and structural conditions of behavioural setting, which serves as a basis for our model development. The model says that environmentally sound behaviour results not only from attitude, but also from contextual factors. The attitude-behaviour relationship is strongest when contextual factors are supportive, but neither too strong nor too weak. With highly supportive structural conditions even individuals with negative attitudes tend to behave in a sound way, while highly negative conditions could discourage individuals with highly positive environmental attitude. Among others Ölander and Thogersen (2006) tested the model.

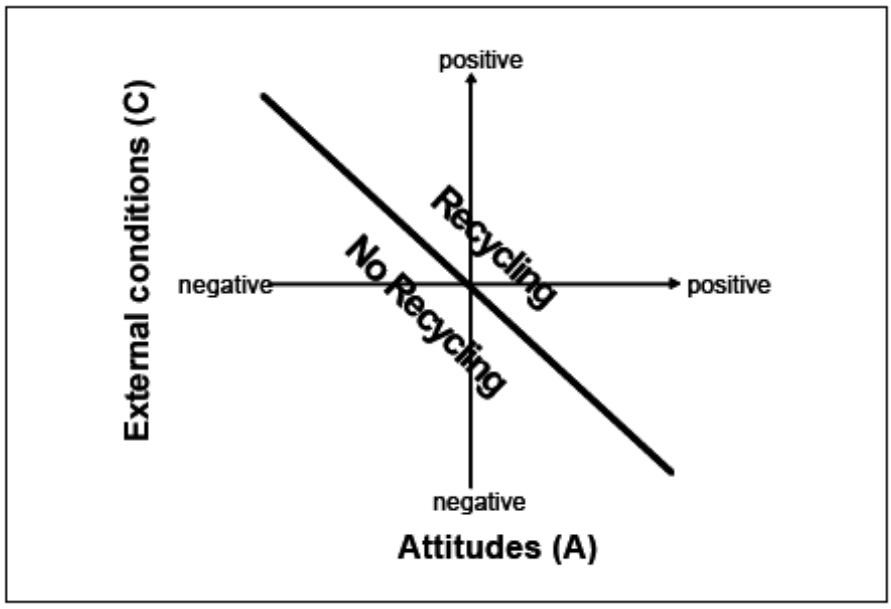

Figure 1: The ABC model developed by Guagnano (1995)

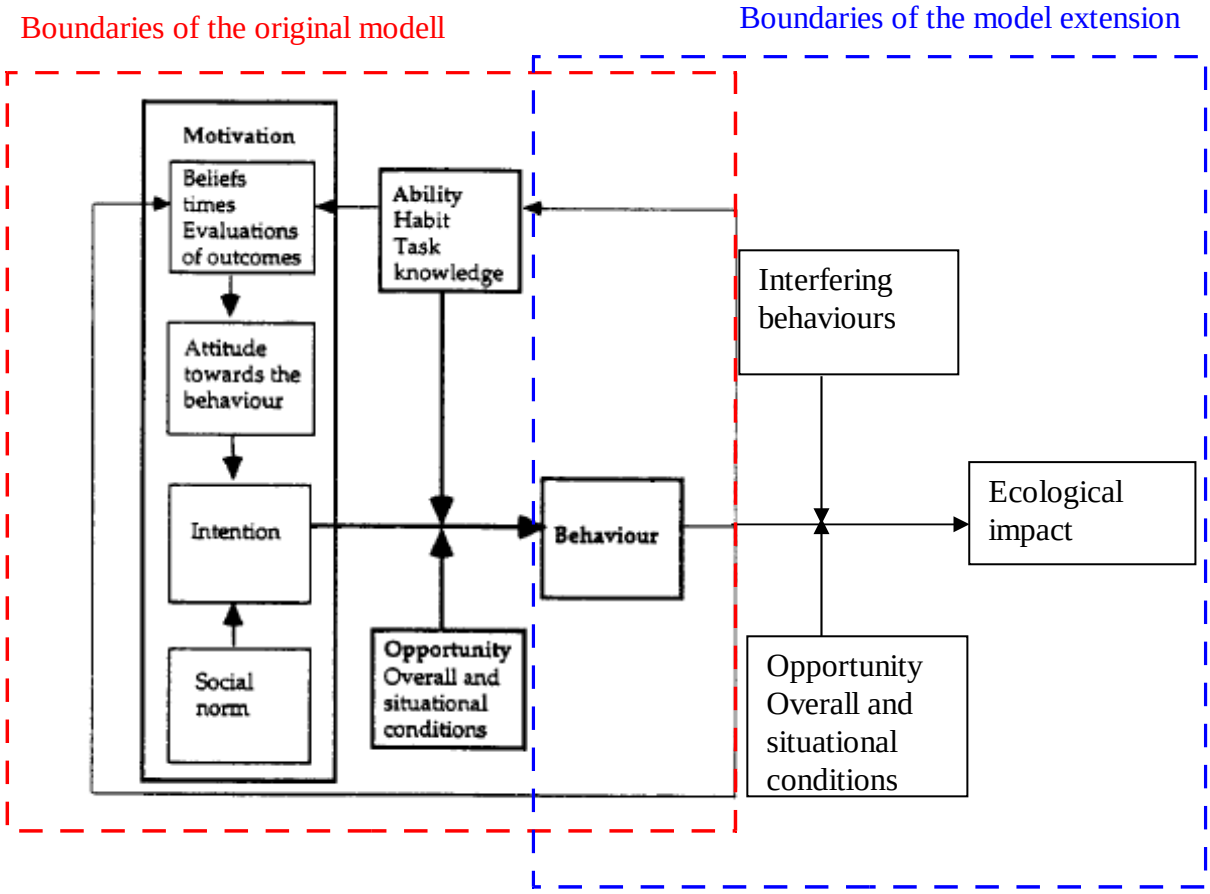

Figure 2. Expanding the motiovation-ability-opportunity-behaviour model
Source: Ölander-Thogersen: Understanding of consumer behaviour as a prerequisite for en , Journal of Consumer Policy; Dec 1995; 18, 4; pg. 317-357

IV: Introducing the BIG (Behaviour-Impact-Gap) problem

Thus, awareness gaps are described and studied in details in literature. Still, it seems our environmental problems cannot fully be explained by the factors listed in the previous section.

Another gap seems to exist that goes beyond the consistency gaps described in previous sections. Even when required behaviour changes do happen, the results may lag far behind what was originally expected. Inconsequence can be found between behaviour of consumers and the outcome observed. For example, the rate gained from recycling companies on post-consumer recycled waste often stays far bellow the recycling rate suggested by consumer surveys. Moreover, the amount of waste is increasing in European families despite their increasing efforts to reduce rubbish. The mismatch between voluntary green action and its environmental impacts has not properly been scrutinised, so we put in the focal point of this article.

We call this phenomenon the BIG problem, a short for Behaviour-Impact-Gap problem.

Figure 2. provides a demonstration of the BIG problem.

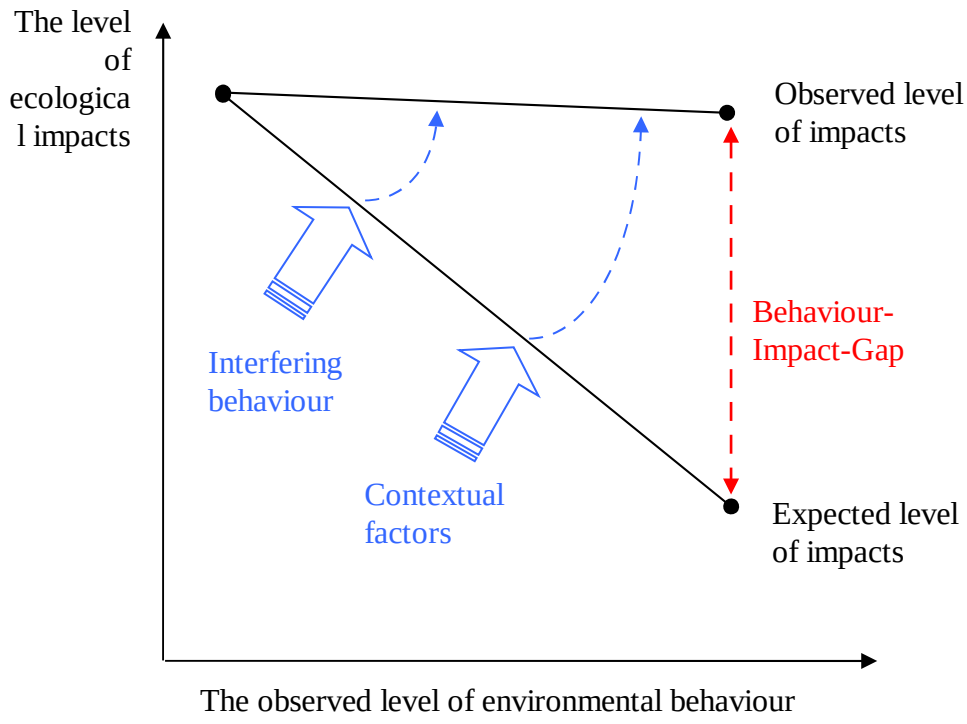

Figure 3: The Behaviour-Impact-Gap (BIG) problem
Source: Csutora (2012), p. 148.

In extreme situations we might face a Behaviour Impact Gap (BIG) problem.

A BIG problem is confronted whenever the required behavioural change is achieved, but observed ecological effect is minor or missing. For example, communication about the ecological superiority of a vegetarian diet is efficient in inducing habitual change in consumers. Still, the ecological footprint of diet changes little, as many freshly made vegans substitute high

impact imported or exotic vega food, like exotic fruits, humus, for meat offsetting most of the gains of their new diet.

Tangible gains may leg behind expected gains for different reasons:

- Green feats are often partially offset by increased use of high footprint items. Imported organic or exotic food is a disputable alternative to non-organic local food.
- Gains may be extinguished by contextual factors beyond the competence and influence of consumers. For example consumers may switch to pellet boilers as a renewable alternative. No sufficient supply of pellet is available within the country to meet the increased demand, thus imported pellet, transported from high distance at high ecological cost is sold on the market. The carbon impacts of transboundary transport offset most gains of using a renewable resource.
- Interfering behaviour in non-target-field areas may influence the ecological impacts of behaviour. Over-enthusiasm in separating waste accompanied with rare enthusiasm in buying articles of recycled materials may lead to redundancies in separated waste, being not economical to be recycled. It is like two mules pulling in opposite directions, one mule being environmental behaviour and the other one working against it.
- The same behaviour may embrace quite different level of ecological impacts depending on contextual factors. Energy savings or recycling behaviour reduces the ecological impacts of wealthy more than that of the modest income families, as their consumption levels are different. Infrastructural possibilities also influence the impact of the same kind of environmental behaviour. Driving to far distance recycling sites may eat up some of the gains of recycling behaviour for certain consumers and may not apply to others.
- Saved money from energy efficiency or other savings generating environmental measures may create income effect and increase further spending on the same items. (rebound effect). A hybrid or electric car may raise the feeling of driving being not polluting, thus may induce more drives.
- Consumers may choose easy-to-do, but marginal actions in the target field or act only occasionally in the expected manner. They do recycle in order to feel “green”, but oppose changing their diet or reducing their car use, although the latter are more influential determinants of total footprint. Most “environmental awareness” campaigns allow for this kind of modest self-deception, as political acceptability overrules ecological wisdom.
- Certain environmental actions are successful provided that at least a given number of consumers act the same way, thus the behaviour of group members interfere with each other. This is especially true when expensive infrastructure must be built for supporting environmental behaviour, e.g. bicycle routes, recycling sites.
- Consumer may also overstate the occurrence of environmental behaviour, but this problem should be regarded as a survey bias rather than a behaviour-impact gap.
- Wishful thinking about prospective gains is common, but should be regarded as a policy making problem rather than a consumer induced one.

Thus, even when consumers act in an environmentally aware manner, their carbon footprint or ecological footprint may still change only slightly.

This spending is induced by a socio-economic system that locks citizens into lifestyles and consumption patterns commensurate with their social status.

While Stern's model is dichotom in terms of behaviour (recycle or not), this model builds on scaling the expected and actual impacts, as well as perceived environmental behaviour.

Running into the behaviour impact gap was not expected at the beginning of the empirical research. Theoretic need for formulating the BIG problem came into being after we had countered the surprising results of the survey.

V Operationalising the ecological impact of environmental behaviour

The difference between the ecological impact of consumers acting "green" and acting "brown can be used as a proxy for grabbing the ecological impact of environmental behaviour. The role of income is overwhelming in driving the ecological footprint as suggested by previous studies. The income-dependence of footprint can be strong enough to overshadow other factors. Thus, efforts must be taken to clear our research results from the effect of income, in order to avoid cut-and-dried findings, such as income matters in ecological footprint. Rather, we may compare the footprint of green and brown consumers to the average of their income group. "Green" consumers are expected to have significantly lower ecological impact than "brown" consumers of similar household income.

VI: Framework of the empirical research

The empirical research is built on a hybrid approach that combines a top-down statistical analysis and a bottom-up survey based approach in order to calculate the ecological footprint of consumption in different segments of society.

In 2010 a representative survey was carried out in order to collect data on the spending structure of consumers, their consumption patterns, their environmental attitudes, demographic data and life satisfaction issues. Responses were collected from 1012 people. The survey was financed through the Norwegian Financial Mechanism. Interviewing was carried out by TARKI, one of the largest Hungarian professional opinion poll companies. The survey sample was representative of the population aged 18+ age group in terms of sex, education, type of settlement and educational background. The questionnaire was carefully piloted on a smaller sample before being broadened. A probability sample was utilised, selected in multiple stages with proportional stratification. All Hungarian regions were involved in the sample with a total of about 70 localities. Each adult with an address in Hungary had equal probability of becoming part of the sample. Then the random walking method, commonly used in sampling, was combined with the Leslie Kish key in order to select those individuals to be interviewed.

Consumers act on the basis of their perceptions (Leon G. Schiffman, Håvard Hansen, Leslie Lazar Kanuk, 2008). A practical approach was utilised when assessing the environmental awareness of end users. The methodology utilised is the same as that used by Eurobarometer in carrying out European-wide surveys, rather than leaning on theoretically based definitions. This way it was hoped that the common perception of environmental awareness as transmitted by media - which may create more substantial influence on human behaviour than pure science - would be captured. It is understood that that this approach may result in a certain level of distortion as perceptions may vary across countries and social segments. Still, these errors are considered minor when compared to other applicable methodologies.

The environmental awareness scale was based on the eight components listed by Eurobarometer 217 and 295 surveys:

1. Chose an environmentally friendly way of travelling
2. Reduced consumption of disposable items
3. Separated most of their waste for recycling
4. Cut down on water consumption
5. Cut down on energy consumption
6. Bought environmentally-friendly products marked with an environmental label
7. Chose locally-produced products or groceries
8. Used their car less

during last month.

People were then assigned to three different groups based on the range of their actions:
Consumers were labelled 'green' when they reported taking action which fitted at least four of the elements above during the month prior to interview. Those people who were absolutely inactive and uninterested in any kind of environmental activities received a brown label. Typical consumers acted green in one to three of the fields listed above. 56.9% of valid responses fell into this category while 21.5% of people were categorized as brown and 21.6% as green.

Survey results

In the survey income level correlated with ecological footprint, the carbon footprint and also each element of the ecological footprint. There were only two exemptions. The ecological footprint of health related products and services did not correlate with income and the same was true for ecological footprint of household items. The former can be easily explained by increased spending of elderly, characterised by lower revenue and impaired health.

Environmentally aware consumers are still expected to show lower ecological footprint than what is predicted by their income level. This assumption did not hold in our survey, no matter what aspects of ecological footprint were studied. Nor ecological footprint or carbon footprint of green, average or brown consumers were significantly in their income bracket.

Figure 4 presents a map of ecological footprint for the three segments of environmental awareness. No difference can be captured in the ecological footprint of green consumers. This goes counter what was hypothesised as at least some effect of environmental awareness was expected. Our findings indicate that environmental policy may not be effective in changing the consumption patterns of environmentally aware consumers.

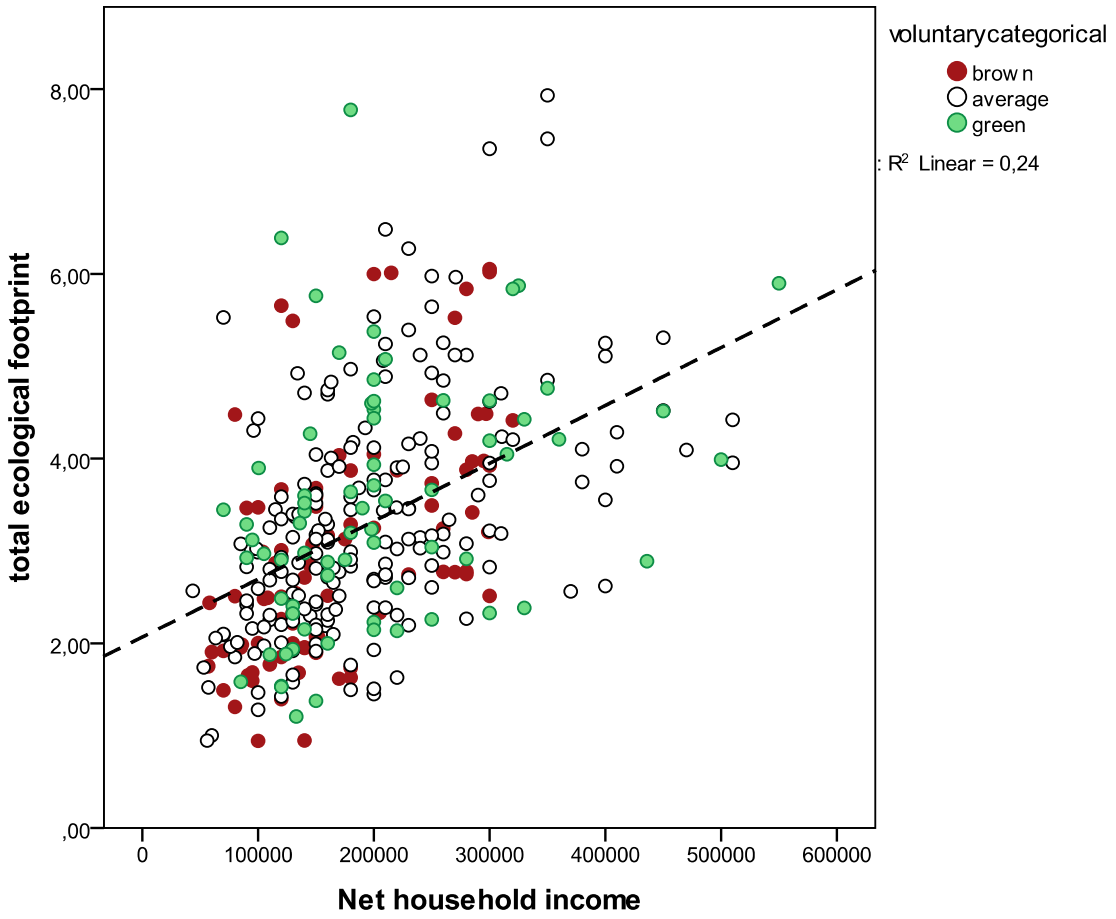

Figure 4: The ecological footprint of green, brown and average consumers

The range of ecological footprint at a certain level of income is quite wide, as revealed by Figure 4. Individual actions and individual consumption pattern do matter: you can double or halve your ecological footprint depending the way what and how you consume. Nice examples can be found in our sample for reducing the impacts associated to a certain level of income. Thus, sustainable consumption is possible at individual level.

The study, however, found no statistically significant difference between the carbon footprints of environmentally aware consumers and ”brown” consumers in the sample. Certain consumers proved to be ecologically aware and active and at the same time their carbon footprints were below the average of their income groups. This was, however, not true at the level of the whole sample. It seems ecological awareness is present mainly at the level of actions such as separating waste or buying energy efficient household appliances, but not at the level of consumption patterns. The findings of this study indicate that:

Interpretation of findings:

Even when environmental awareness galvanises green actions, it does not necessarily put a stop to increasing consumption. This results in the prevailing gap between environmental action and ecological impacts. More emphasis should be thus placed on communicating the ecological consequences of consumption habits. Also, altering ecologically destructive consumption patterns to lifestyles more compatible with natural surroundings and ecological limits is of paramount importance. The rebound effect is apparently effective at the level of

individual behaviour. One may do something to relieve one's ecological guilt, but compensate for these achievements by consuming more.

The communication of policy designed to encourage desirable actions to save the planet may be mis-targeted, directing people towards tolerable, but marginal actions. Political acceptability may dominate over ecological effectiveness.

Although, no statistical relationship was found at the macro level between voluntary actions and ecological footprint, but there is still a place for individual action. Environmental behaviour should not be interpreted in any case as superfluous. One can make a difference by being a green dot below the regression line, even though most people would not do the same.

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