

Values and sustainable lifestyles

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With ever-increasing concerns about the consequences of climate change, households are an important focus for change. There is increasing pressure on households to change lifestyles and adopt behaviours that require less energy and natural resources. At the same time, retailers and producers of consumer goods aim to persuade people to consume more through commercial advertisements. Social science research examining sustainable behaviours often fails to examine the relative influence of both environmental concern and materialism simultaneously. Moreover, most of this research focuses on explaining or promoting behaviours with pro-environmental intent, thereby ignoring many consumer behaviours that may have a significant environmental impact. This article aims to address some of these shortcomings by examining the relationships between materialistic and environmental values and different consumer behaviours. Survey data from 194 individuals from 99 households were analysed. The findings show that quite a number of people express both relatively high levels of environmental concern and relatively high levels of materialism simultaneously. Moreover, materialism and environmental concern appear to be related to different types of behaviours. This raises important questions for the promotion of sustainable lifestyles, which may need to address not only environmental concerns but also materialistic concerns.

Keywords: Environmental concern; household consumption; materialism; sustainability; values

INTRODUCTION

The environment has come to the forefront of the political agenda in recent years, with increasing concerns over the threats posed by climate change and finite natural resources. If current global carbon emissions are not reduced substantially we risk irreversible climate change, resulting in 'major disruption to economic and social activity, on a scale similar to that associated with the great wars and the economic depression of the first half of the 20th century' (Stern, 2007, pvi). The UK Climate Change Act, passed into law during 2008, commits the nation to reduce CO₂ emissions by at least 80% by 2050 (DEFRA, 2008). Around 27% of UK carbon emissions arise directly from households (Office of Climate Change, 2007). Moreover, when indirect (upstream) emissions are taken into account, households are responsible for more than 70% of UK carbon emissions (Druckman and Jackson, 2009). Likewise, 25% of all the water abstracted in England and Wales is used directly in households (DEFRA, 2008).

As in other Western societies, household energy use, water consumption and waste production account for a substantial proportion of UK resource use and carbon emissions, and consumer behaviour change can play an important role in helping to meet reduction targets. Many policymakers have urged the need to develop more sustainable lifestyles.

Most social science research in this area focuses on the relationship between environmental values and attitudes and behaviours with pro-environmental intent, thereby ignoring other values and behaviours, which may have a significant environmental impact. The few studies that do exist suggest that different behaviours may be related to different variables (e.g. Stern and Oskamp, 1987; Axelrod and Lehman, 1993; McKenzie-Mohr *et al.*, 1995; Pepper *et al.*, 2009).

The current article aims to provide a broader perspective on the relationship between values and lifestyles. It explores the relationship between values, materialism and environmental concern and a range of consumer attitudes and behaviours, including intentional pro-environmental behaviours.

Lifestyles

The need to develop more sustainable lifestyles is generally accepted (Jackson, 2008). However, in the social science literature, it is not always clear what lifestyles are and whether different lifestyles can or should be distinguished (Heijs *et al.*, 2005). What is clear though is that lifestyle changes suggest not only the adoption of intentional pro-environmental behaviour but also changes in behaviours that people do not necessarily link to the environment. Any research that seeks to elicit beliefs about the environment and environmental change must investigate those beliefs within a

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larger context (Rätzl and Uzzell, 2009). Understandings and beliefs about environmental change have to be seen as intermeshing within a wider set of understandings and beliefs, and it is this inter-relationship that enables the prediction of pro-environmental behaviour.

Existing research on environmental behaviour often only focuses on self-reports of intentional pro-environmental behaviours. The focus of this research is on explaining or changing behaviours that people adopt because they wish to be environmentally sound: for example, recycling products, using public transport instead of a car, turning down their thermostats. However, decisions to adopt these behaviours are not only linked to environmental concerns. Moreover, there are many consumer behaviours where environmental concerns rarely play a significant role, for example, buying audiovisual equipment or going on holiday. Some existing research has shown that although environmental concern is related to intentional pro-environmental behaviour, it is not necessarily related to the actual environmental impact (direct and indirect energy use) of households (e.g. Stern, 1992; Gatersleben *et al.*, 2002). If the aim of our research is to help reduce the environmental impact of households or individual consumers, it is essential, therefore, to examine a wide range of consumer behaviours.

In this article we examine the relationship between values and a range of consumer behaviours. The article examines intentional pro-environmental behaviours as well as behaviours that people may not necessarily directly associate with environmental issues but which may vary significantly in energy requirements and therefore environmental impact. These are behaviours such as time spent watching television (TV) or reading a book. It also examines the possession of consumer products associated with different levels of direct (related to the use of a product) and indirect (related to the production of a product) energy use. And finally, it examines the relative importance people attach to these products as an indicator of consumer intentions.

Values

In the social sciences, values are usually defined as 'concepts or beliefs about end states or behaviours that transcend specific situations, guide selection or evaluation of behaviours and events, and are ordered by relative importance' (Schwartz and Bilsky, 1990; see Dietz *et al.* (2005) for an overview of values and environmental concern literature). Most of the research on values in the social sciences is rooted in the work of Rokeach (1973), who developed a list of 18 instrumental and 18 terminal values. Schwartz built on this list and developed a list of 56 'guiding principles in life' (e.g. Schwartz, 1992). A large number of studies, including populations from all over the world, have been conducted using the Schwartz value inventory. This research suggests that human values can be grouped into 10 motivational clusters: benevolence, universalism, self-direction, stimulation, hedonism, achievement, power, security, conformity and tradition. These value clusters can be plotted

along two dimensions: self-enhancement (e.g. power) versus self-transcendence (e.g. universalism) and conservation (e.g. tradition) versus openness to change (e.g. stimulation).

Stern and colleagues have suggested that there are three values that underlie environmental concern: egoism, altruism and biospherism (Stern and Dietz, 1994; Stern *et al.*, 1999). They adopted the Schwartz values inventory to test this hypothesis and found support for it. De Groot and Steg (2007, 2008) have since further developed this scale and created and tested a short rating scale that aims to measure these three value orientations. Their research has shown that biospherism and to some extent altruism are positively related to environmental concern and behaviour (De Groot and Steg, 2007, 2008).

MATERIALISM AND ENVIRONMENTAL CONCERN

A range of studies have shown that general values are related to consumer-related attitudes such as environmental concern and materialism. Materialism can be defined as 'the importance ascribed to the ownership and acquisition of material goods in achieving major life goals or desired states' (Richins, 2004, p210). Materialistic individuals place more value on becoming wealthy, owning possessions and conveying status with possessions. Environmental concern, in this study, is defined as the extent to which people place value on environmental protection and limited industrial growth as opposed to human control and management of the environment, limitless natural resources and unlimited industrial growth (Dunlap and Van Liere, 1978). The most common way to measure this environmental concern is by means of the New Environmental Paradigm (NEP) scale developed by Dunlap and colleagues (Dunlap and Van Liere, 1978; Dunlap *et al.*, 2000). Materialism tends to be negatively related to pro-environmental behaviour (Richins and Dawson, 1992; Cohen and Cohen, 1996; Kasser, 2005). Environmental concern, on the other hand, is positively related to pro-environmental behaviour (e.g. Stern, 2000; De Groot and Steg, 2008), although relationships are generally weak. We know little, however, about the relationship between these values and consumer lifestyles beyond intentional pro-environmental behaviours.

There is an implicit assumption in the literature that materialism and environmental concern are simple opposites. The hypothesis that materialism and environmental concern should be negatively correlated originates in the Inglehart tradition (e.g. Inglehart, 1990, 1995). Inglehart's hypothesis is based on Maslow's (1954) insight that individuals pursue certain goals in hierarchical order: from materialism to post-materialism. Inglehart (1990) showed that (political) values in Western societies have shifted from materialism (e.g. giving high priority to maintaining order in nations and fighting rising prices) to postmaterialism (e.g. giving higher priority to participation in government decision and freedom

of speech; Inglehart, 1990; Abramson and Inglehart, 1995). Inglehart explains this by suggesting that in Western countries the basic need for food, shelter, safety and comfort has been satisfied; therefore, people can be more concerned with higher-order values such as personal freedom and development (see Maslow, 1954).

Kempton *et al.* (1996) suggest that materialism and environmental concern are incompatible, finding in their survey that more materialistic American individuals value environmental protection less. Similarly, Saunders (2007) found a significant negative correlation between materialism and attitudes towards environmentalism in an Australian sample. Other studies also find a negative correlation between materialism and environmental concern, although these correlations are not strong (e.g. Burroughs and Rindfleish, 2002; Clump *et al.*, 2002). The idea that materialism and environmental concern are opposites is also supported by research examining general values based on the Schwartz values inventory (e.g. Schwartz and Bilsky, 1990; Schwartz, 1992; Schwartz and Boehnke, 2004), which suggests that environmental concern and materialism are often inversely related to the same values. A range of studies have shown that materialism is strongly related to self-enhancement whereas environmental concern is strongly related to self-transcendence (Stern and Dietz, 1994; Schultz and Zelezny, 1999; Richins, 2004; Kilbourne *et al.*, 2005; De Groot and Steg, 2008). Richins (2004) used the Schwartz value survey (e.g. Schwartz and Bilsky, 1990; Schwartz, 1992, 2006) to test the external validity of her scale and found strong positive correlations between materialism and power, achievement, hedonism and stimulation and negative relations with self-direction, universalism, benevolence, tradition and conformity. Kilbourne *et al.* (2005) showed in a study among university students in Canada, Germany and the USA that materialism was positively related to self-enhancement and negatively to self-transcendence. Stern *et al.* (1995, 1999) found that general values are related to environmental concern (NEP), which is in turn related to specific environmental norms and self-reported pro-environmental behaviours. Several studies have supported this model (e.g. Schultz, 2001; De Boer *et al.*, 2007; De Groot and Steg 2007, 2008). De Groot and Steg (2008) have demonstrated that egoism is negatively related to NEP and pro-environmental behaviour whereas biospherism is positively related. Others have also shown that environmental concern is negatively related to tradition (tradition, conformity, security; e.g. Schultz and Zelezny, 1999; De Groot and Steg, 2008).

These studies suggest that materialism and environmental concern may be perceived as opposite ends on a self-enhancement versus self-transcendence dimension. However, most of these studies report small relationships between the relevant concepts and few studies find strong negative correlations between materialism and environmental concern, suggesting that many people may hold both, potentially conflicting values simultaneously. Some

more recent literature rejects the hypothesis that materialism and environmental concern are incompatible by showing that environmentalism is rising not only in the developed world but also in developing countries (Brechin and Kempton, 1994). Indeed in later work, Maslow himself suggested that his earlier hierarchical ordering of needs was flawed (Maslow, 1968). Moreover, cross-cultural research by Ger and Belk (1996) suggests that individuals in more affluent societies (e.g. USA) are more materialistic than those who live in less affluent societies. Pepper *et al.* (2009) found that socially conscious behaviour was related to social values but frugal behaviour was not; this instead was more strongly related to materialism. Steger *et al.* (2005) showed in a survey among US and Canadian citizens and activists that the Inglehart postmaterialist value measure and the Dunlap and Van Liere NEP index are separate constructs and do not reflect a singular larger dimension.

This article will examine how materialism and environmental concern are related, how they are related to general values and specifically how they are related to different consumer behaviours. The study examines to what extent people may hold two potentially conflicting values simultaneously, one driving consumption up and the other potentially driving consumption down, and examines what this may mean for consumer behaviour, the environment and well-being.

Well-being

High levels of materialism have been linked to lower levels of well-being (Burroughs and Rindfleish, 2002; Kasser, 2002; Tatzel, 2002; Vansteenkiste *et al.*, 2006). This has been found for adults and adolescents (Cohen and Cohen, 1996; Sheldon and McGregor, 2000; Kasser, 2005). The negative correlation between materialism and well-being is often explained in terms of psychological and personality factors, which may underlie materialism (e.g. Kasser, 2002; Arndt *et al.*, 2004; Chaplin and John, 2007). Solberg *et al.* (2004), however, suggest that this relationship is determined by a range of factors. They did not find support for the hypothesis that it can be explained by personality factors. Burroughs and Rindfleish (2002) argue that the often found negative correlation between materialism and psychological well-being may actually be because of a value conflict that people experience. Their research in the USA showed that the extent to which people hold both materialistic values and conflicting social altruistic values (family values, religious values) at the same time is indeed related to psychological tension and well-being. In this research we will explore the relationship between values and well-being. We examine whether the extent to which respondents hold different values is related to their reported well-being.

RESEARCH QUESTIONS

This article explores how values are related to environmental concern and materialism and consumer behaviours. Specifically, it examines whether people with more altruistic and

biospheric values are more likely to express values indicative of stronger environmental concern and weaker materialism. It also explores how values and attitudes are related to a range of consumer behaviours, including time spent on various activities, possession and perceived importance of consumer products, pro-environmental intentions and household communication about environmental issues. The article aims to shed more light on the relationship between materialism and environmental concern and to explore the extent to which these concepts can be perceived as extremes of one underlying dimension or as distinct concepts, which are related to different behaviours in different ways.

METHOD

Procedure and respondents

The data presented in this article are part of a one-year longitudinal study that aims to examine the values and behaviours of UK households and in particular how attitudes and behaviours of these households may change in response to a range of interventions aiming to reduce household energy use. The data reported here were all collected before the interventions took place. This article will focus on the relationship between values and behaviours. The effect of the interventions will be discussed elsewhere.

Participants for the study were recruited from a sample of UK households who own a store card of a major DIY chain in the UK. The context of the study may have affected participant responses, which should be considered when interpreting the findings.

After invitation letters were sent to all potential respondents, participants were selected from the initial responses ($N \approx 3000$) using information on the database to select those who could be used to represent the current UK national composition of social grades. Care was taken to select households from all demographic groups, but some lower socio-economic status groups proved difficult to recruit and are therefore underrepresented in the project. The type and age of the home, and participant age were also considered. Questionnaires were sent to all household members 16 years and above in each of the participating households in July/August 2008. The respondents were asked to complete the questionnaire before they were visited by an interviewer who would assess the environmental impact of each household by means of a range of questions on home water and energy use and waste production. The interviewer collected the questionnaires from the householders and presented each household with a 'goodie bag' (including a range of eco-products) and energy advice. A £500 grant was given to each household participating in the study to spend on environmental improvements. They received this after the first interview together with the first information pack and some feedback information. All interviews were conducted in August and September 2008.

A total of 194 respondents from 99 households completed and returned the questionnaires. One participant (from a single household) was removed from the data file as too

many questions were unanswered. Respondents' ages ranged from 16 to 73 years, with an average age of 43 years; 51% of respondents were female and 49% were male. The average number of people living in a household was 2.8. Around 20% of participants lived in three person households and 28% in four person households, with less than 5% each living in single, five person and six person households. The majority of households consisted of a couple with children (47%) or a couple with no children (32%). Around 36% of the respondents said they had plans for changing their household environmental impact in the coming year. They were most likely to refer to buying new products or technologies (mentioned by 73%) and less likely to report behavioural changes that aimed at reducing energy use (mentioned by 22%). The most often mentioned plan was to buy and install more insulation. Of the given reasons for participation, trying to live in a more environmentally friendly way was rated as most important, followed by saving money and learning about environmental issues. The £500 grant was rated lowest in contributing to their decision.

Questionnaire

The questionnaire comprised ten sections; only those relevant for this article are discussed here. Questions on household conflict will be reported elsewhere.

Activities: The first section examined how often respondents participated in 21 activities (1 = almost every day, 7 = I never do this), such as watching TV for 3 hours or more, eating meat and working as an environmental volunteer. For the analysis this was reversed so that 1 = I never do this and 7 = almost every day. Activities were chosen to reflect a range of activities that require the use of energy and materials (e.g. watching TV, playing computer games) as well as activities that do not necessarily require the use of energy and materials (e.g. gardening, going for a walk, volunteering).

Possessions: Respondents were asked to rate various items (e.g. TV, car, books) according to their personal importance (1 = totally unimportant, 5 = very important) and to indicate whether they owned that item. The list included things that require materials and resources to produce and use (e.g. TV, computer) and things that do not (e.g. a membership to a British conservation charity: National Trust) as well as things that were assumed to be clearly identifiable as environmentally friendly products (e.g. solar panels, water butts). A factor analysis was conducted to examine whether there is any underlying pattern in the respondents' perceptions of how important different consumer goods are to them. This analysis could not be conducted for all 23 consumer goods as there was very little variation in perceived importance for eight of them. The factor analysis with the 15 remaining items revealed two new scales. Two new variables were computed on the basis of these factors by calculating the mean importance ratings of items within each of these two groups: low-energy possessions, possessions associated with relatively low energy use or energy conservation (e.g. arts and crafts materials, solar panels, CF light

Table 1 | Relationship between different values

	Environmental concern	Materialism	Altruism/biospherism	Egoism
Concern	1.00			
Materialism	-0.20**	1.00		
Socio/bio	0.37**	-0.21**	1.00	
Egoism	-0.17*	0.50**	0.01	1.00

*Correlation is significant at the 0.05 level (two-tailed).

**Correlation is significant at the 0.01 level (two-tailed).

bulbs; $\alpha = 0.73$); and high-energy possessions, possessions associated with relatively high direct and indirect (embodied) energy use (e.g. DVD players, TVs, mobile phones and microwave ovens; $\alpha = 0.63$). On average, respondents found low-energy possessions slightly less important ($M = 3.14$, $stddev = 0.62$) than high-energy possessions ($M = 3.46$, $stddev = 0.67$; $t = 5.35$ (192), $p < 0.001$; 1 = not at all important, 5 = very important).

Participation in the project: Section three explored reasons for participation in the research product using

open-ended questions, asking about their motivations to take part in the project, whether they were planning any changes because of their participation, and on what they were thinking of spending the £500.

Pro-environmental intentions: In section four, respondents were asked to indicate which lifestyle changes they planned to try during the following 12 months. Questions were asked about intentions to save gas and electricity in the home, to change transport behaviours and to change food consumption (e.g. eat more organic produce) (1 = I

Table 2 | Relationships between values and time spent on various activities

	Environmental concern	Materialism	Altruism/biospherism	Egoism
Watch more than 3 h TV	0.09	0.11	-0.12	-0.03
Sport/exercise	-0.06	0.02	0.09	-0.03
Arts and crafts	0.01	-0.08	-0.12	0.04
Env. volunteering	-0.08	0.10	0.06	-0.01
Community work	0.02	-0.06	-0.16*	-0.00
Attending church	-0.13	-0.13	-0.10	-0.03
Fun shopping	0.06	0.27**	-0.08	0.05
Read books	0.13	-0.08	-0.04	-0.10
Play computer games	0.01	0.20**	-0.11	0.09
Gardening	0.03	-0.31**	0.04	-0.14
Cook meals at home	0.10	-0.08	-0.07	0.19**
Go out for meals	0.05	0.14	-0.07	0.10
Go for a walk	-0.12	-0.17*	0.06	-0.07
Go cycling	-0.00	0.09	0.08	0.13
Meet up with friends	-0.01	0.15*	0.10	-0.05
Eat meat	-0.10	0.14	0.00	-0.11
Go to farmers' market	-0.01	-0.22**	0.11	-0.14*
Go to pub	0.04	0.16*	-0.08	0.03
Go to cinema	0.19**	0.14	0.03	-0.02
Surf the internet	0.05	0.19**	0.04	-0.08

*Correlation is significant at the 0.05 level (two-tailed).

**Correlation is significant at the 0.01 level (two-tailed).

will definitely not try, 5 = I will definitely try). To develop a robust scale indicating the average pro-environmental intention of each respondent, one scale was computed measuring the average pro-environmental intention of the respondents across all these behaviours. The scale had high internal consistency ($\alpha = 0.83$). On average, respondents reported relatively high intentions to adopt pro-environmental behaviours ($M = 3.59$, $\text{stddev} = 0.52$; 1 = no intention, 5 = strong intention).

Perceived difficulty: Section five examined how easy/difficult participants anticipated that these changes would be (1 = very difficult, 5 = very easy). On average, respondents believed it would be relatively easy to change their behaviour ($M = 3.14$, $\text{stddev} = 0.54$; 1 = very difficult, 5 = very easy; $\alpha = 0.78$).

NEP: The next section consisted of the NEP scale (Dunlap *et al.*, 2000), which was originally developed by Dunlap and Van Liere (1978). It involved respondents indicating how much they agreed (1 = strongly disagree, 5 = strongly agree) with a set of 12 statements concerning the environment (e.g. plants and animals exist primarily to be used by humans). A new scale was created by calculating the average score of each respondent across all items. A high internal consistency was found for this scale ($\alpha = 0.80$). On average, respondents indicated that they had strong environmental concern ($M = 3.86$; $\text{stddev} = 0.79$; 1 = totally disagree, 5 = totally agree).

Materialism (MVS): Section seven focused on respondent views of money and possessions with the materialism scale developed by Richins (2004). Respondents were presented with statements such as 'I admire people who own expensive homes, cars, and clothes' and asked to rate how much they agreed with each (1 = strongly disagree, 5 = strongly agree). One new variable was created representing the relative importance respondents attach to materialistic aspects in life, by calculating the average score for each respondent across the items. The internal consistency of this scale was high ($\alpha = 0.88$). On average, respondents indicated that they are moderately materialistic ($M = 2.58$; $\text{stddev} = 0.55$; 1 = totally disagree, 5 = totally agree).

General values: In section eight respondents were asked to report how important a set of 13 values were in their lives (-1 = opposed to my values, 0 = not important, 1 = somewhat important, 7 = of supreme importance), based on the value orientations scale of De Groot and Steg (2007, 2008). For each respondent, the mean score was calculated across the items belonging to the relevant scale: egoism (social power, wealth, being influential, authority, ambitious), biosphericism (respecting the Earth, unity with nature, protecting the environment, preventing pollution) and altruism (equality, being helpful, a world at peace, social justice) (see De Groot and Steg, 2007). The internal consistency for the egoism scale was good ($\alpha = 0.78$). The internal consistency for the biospheric scale was very good ($\alpha = 0.87$). The internal consistency for the altruism scale was unsatisfactory ($\alpha = 0.50$). Further analyses suggested

that there was significant overlap between the biospheric and altruistic values. It was therefore decided to develop two scales, one reflecting the relative importance respondents attach to egoistic values ($M = 2.14$, $\text{stddev} = 1.33$) and the other reflecting the relative importance respondents attach to biospheric and altruistic (or self-transcendent) aspects ($\alpha = 0.79$; $M = 4.83$, $\text{stddev} = 1.06$).

Demographics and well-being: The final section included questions to assess demographic characteristics and well-being. One variable was calculated to represent the reported well-being of the respondents by calculating the mean score, for each respondent, across the five relevant times. On average, the respondents tended to report they were quite satisfied with their lives ($\alpha = 0.82$; $M = 5.13$; 1 = strongly disagree, 7 = strongly agree).

RESULTS

Values, materialism and environmental concern

Table 1 shows that, as expected, materialism is negatively related to biosphericism and altruism. Materialism is positively related to egoism. Environmental concern is also negatively related to materialism and egoism. However, these correlations are not strong and suggest that a significant number of respondents express both relatively strong (i.e. above the mean) environmental concern and relatively strong materialism. Further analysis revealed that this was the case for around 25% of the respondents. Table 1 also

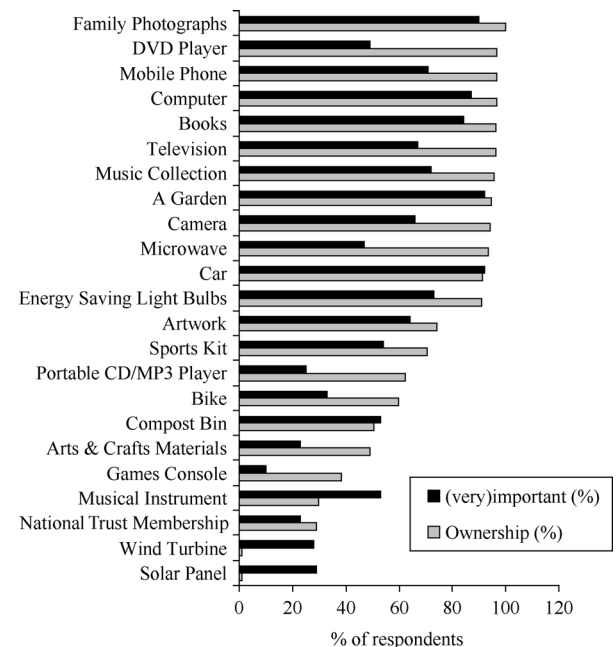


Figure 1 | Percentage of respondents who reported owning each of the possessions and percentage of respondents who rated it as important or very important

shows that there is no significant relationship between egoism and biospherism/altruism, suggesting that these are unrelated factors. This again supports the idea that materialism (and egoism) and environmental concern (biospherism) do not reflect one singular underlying dimension (e.g. self-enhancement versus self-transcendence).

Values and behaviour

Activities: The most popular activities undertaken by respondents on an almost daily basis included cooking meals at home (50% of respondents), reading books (37%), surfing the internet (36%) and watching TV for 3 hours or more (28%). Activities that most respondents conducted only a few times a week included eating meat (42%), playing sports/exercise (39%) and getting together with friends and family (27%). Activities that most respondents said they

rarely or never conducted included working as an environmental volunteer (93% respondents), spending time on collections (e.g. a stamp collection) (80%) and attending church or religious gatherings (60%).

Table 2 shows that neither general values nor environmental concern are strongly related to activities. Materialism does appear to be moderately related to a range of activities. Those who express stronger materialism spent more time fun shopping, playing computer games, meeting up with friends, eating meat, going to the pub and surfing the internet and less time gardening, going for a walk and going to a farmers' market. However, there may be an age and gender dimension underlying this finding. In this study, older respondents were significantly less likely to be materialistic ($r = -0.38$) and egoistic ($r = -0.30$) than younger people. Women had significant lower scores on egoism ($M = 1.96$) and materialism

Table 3 | Relationship between values and importance attached to consumer products

	Environmental concern	Materialism	Altruism/biospherism	Egoism
Television	-0.18*	0.32**	-0.06	0.20**
Microwave	-0.29**	0.19*	-0.10	0.13
Computer	-0.17*	0.14	0.06	0.14
Mobile phone	-0.05	0.35**	0.01	0.22**
Music instrument	0.10	-0.05	0.12	-0.03
Arts and crafts	0.12	-0.20**	0.16*	-0.02
Camera	0.09	-0.03	0.02	0.10
National Trust membership	0.17*	-0.28**	0.18*	-0.05
Compost bin	0.34**	-0.35**	0.36**	-0.11
Car	-0.13	0.21**	-0.03	0.18*
Bike	0.10	0.11	-0.01	0.11
Solar panel	0.24**	-0.23**	0.24**	-0.06
Music collection	0.13	0.11	0.22**	0.03
Wind turbine	0.21**	-0.18*	0.30**	0.02
CF light bulbs	0.17*	-0.14	0.28**	0.16*
Sports goods	0.00	0.22**	-0.04	0.20**
Garden	0.13	-0.21**	0.15*	0.02
Books	0.07	-0.22**	0.23**	-0.02
CD player	0.12	0.22**	0.05	0.16*
DVD player	-0.08	0.22**	-0.02	0.13
Photos	0.00	0.01	0.18*	0.14*
Games console	0.00	0.34**	-0.02	0.35**
Artwork	0.22**	-0.15*	0.14	-0.07

*Correlation is significant at the 0.05 level (two-tailed).

**Correlation is significant at the 0.01 level (two-tailed).

($M = 2.49$) than men ($M_{\text{egoism}} = 2.45$; $t = 3.18$ (192), $p < 0.01$; $M_{\text{materialism}} = 2.66$; $t = 2.16$ (189), $p < 0.05$). Partial correlations were therefore computed to control for age. To control for gender these were computed separately for men and for women. The results of this analysis showed that, independent of age, materialism among men is related to eating meat ($r = 0.21$, $p < 0.05$) and playing computer games ($r = 0.20$, $p < 0.10$). Women who express stronger materialism spent more time fun shopping ($r = 0.34$, $p < 0.001$) and going out for meals ($r = 0.29$, $p < 0.01$) and less time going to a farmers' market ($r = -0.25$, $p < 0.05$) than women with weaker materialism. These findings suggest that to some extent people are more likely to engage in activities that support their values, but only for materialism, only for a limited number of activities, and these activities vary between men and women.

Possessions owned and their importance

Figure 1 shows the percentage of respondents who reported owning each of the possessions presented in the questionnaire and the percentage of respondents who perceived each good as important or as very important. All participants reported owning family photographs and more than 95% of people owned electrical goods such as a mobile phone (97%) and a TV (96%). Around 90% of participants owned a car (91%) and energy saving light bulbs (91%). Fewer participants reported owning items such as a bike (60%), a compost bin (51%), a games console (38%) and a National Trust membership (29%). Only two respondents each reported owning a solar panel and a wind turbine. Figure 1 shows that, for most, possession ownership and perceived importance are related, that is, those goods that are owned by most people are also perceived to be important by most people. There are, however, a few exceptions. For some goods, the percentage of respondents who perceive them to be important is much lower than the percentage of

respondents who own the goods. This is the case for the DVD player, mobile phone, TV, music collection, camera, microwave oven, portable music player, bike, arts and crafts materials and the games console. Musical instruments, wind turbines and solar panels are the only goods that are not owned by many respondents, but which are perceived to be important by a large percentage of respondents.

Correlations were computed between value orientations and importance attached to consumer goods. Table 3 shows that all values are to some extent related to the perceived importance of consumer goods. Those with stronger environmental concern and those with stronger self-transcendent values (altruism and biospherism) are particularly likely to attach importance to environmental products (e.g. solar panels, compost bins). People with stronger materialistic (and to some extent egoistic) value orientation attach more importance to a range of modern goods (TVs, microwaves, CD players, games consoles) and less to environmental goods. As materialism is related to age and gender, we again computed partial correlations to control for these effects and found that for men materialism is still positively related to importance of the TV ($r = 0.34$, $p < 0.01$), computer ($r = 0.22$, $p < 0.05$), mobile phone ($r = 0.27$, $p < 0.02$), car ($r = 0.34$, $p < 0.01$) and DVD player ($r = 0.28$, $p < 0.01$) and negatively related to the importance of a compost bin ($r = -0.31$, $p < 0.01$), solar panels ($r = -0.25$, $p < 0.05$) and a wind turbine ($r = -0.25$, $p < 0.05$). For women materialism is related to the importance of the microwave ($r = 0.34$, $p < 0.01$), the mobile phone ($r = 0.41$, $p < .001$), sports goods ($r = 0.26$, $p < 0.05$) and a CD player ($r = 0.27$, $p < 0.05$) and negatively to the importance of artwork ($r = -0.27$, $p < 0.05$), a compost bin ($r = -0.25$, $p < 0.05$), solar panels ($r = -0.34$, $p < .01$) and a wind turbine ($r = -0.28$, $p < 0.01$). Generally, these findings suggest that those who are more materialistic attach more importance to possessions

Table 4 | Relationship between values and importance of types of consumer products (results of regression analyses)

	Low-energy possessions	High-energy possessions
% explained variance	11%	19%
	($F = 17.76$ (2187), $p < 0.001$)	($F = 19.28$ (2187), $p < 0.001$)
Materialism	-0.20**	0.39***
Environmental concern	0.31**	-0.08
% explained variance	13%	6%
	($F = 13.00$ (2190), $p < 0.001$)	($F = 6.65$ (2191), $p < 0.01$)
Altruism/biospherism	0.37***	-0.03
Egoism	-0.01	0.25**

Note: Regression weights presented in the table indicate the unique correlation between the two relevant variables, controlled for the correlation between the dependent variable (importance) and the other independent variables. Beta weights can range from 0 (no relationship) to 1 (perfect relationship). * $p < 0.05$ (relationship is significant at the 95% confidence level), ** $p < 0.01$ (99% confidence level), *** $p < 0.001$ (99.9% confidence level).

that are associated with higher direct and indirect energy use (e.g. TV, mobile phone, car, with the exception of sports goods) and less importance to possessions that are associated with lower energy use or with energy conservation (e.g. arts and crafts materials, a compost bin, solar panels). The reverse is true for the relationship between environmental concern and perceived importance of possessions.

Table 4 shows that value orientations account for a significant (but not large) percentage of the variance in perceived importance of consumer goods. The relative importance of possessions that are associated with low energy use or energy conservation is negatively related to materialism and positively to environmental concern and self-transcendent values (biospherism and altruism). The importance attached to possessions that are associated with higher energy use is only (positively) related to materialism.

Intentions and perceived ease of change

Tables 5 and 6 show the relationship between values on the one hand and intentions to adopt pro-environmental behaviours and perceptions of how difficult it is to adopt these behaviours on the other. Overall, these two concepts were related ($r = 0.51, p < 0.01$), indicating that the more likely people are to say they will adopt the behaviour, the more likely they are to say they think it is easy to do so. These correlations were the same for almost all behaviours, but they were a bit stronger for cycling more ($r = 0.72$) and flying less ($r = 0.66$) and weaker for unplugging electrical goods when on stand-by ($r = 0.30$), switching off lights when not in the room ($r = 0.41$) and installing insulation ($r = 0.40$).

Table 5 shows the relationship between values and intentions to adopt a range of pro-environmental behaviours. The relationship between behaviour intentions and environmental

Table 5 | Relationship between values and intentions to adopt pro-environmental behaviours

	Environmental concern	Materialism	Altruism/biospherism	Egoism
<i>Energy</i>				
Use less gas and electricity	0.12	-0.18*	0.12	0.00
Replace equipment	0.17*	-0.10	0.26**	0.09
Replace light bulbs	0.16*	-0.19**	0.14	0.13
Technology for green energy	0.18*	-0.01	0.10	0.02
Sign up to green tariff	0.29**	-0.21**	0.22**	-0.07
Turn down heating	0.22**	-0.06	0.17*	0.02
Install insulation	0.05	-0.03	0.09	0.05
Turn off lights	0.14	0.04	0.14	0.01
Unplug equipment not in use	0.21**	-0.19**	0.15*	-0.12
<i>Transport</i>				
Drive less	0.15*	-0.20**	0.13	0.02
Cycle more	0.10	-0.06	0.02	-0.03
Use more public transport	0.06	-0.19*	0.18*	-0.09
Avoid travelling by plane	0.19*	-0.22**	0.22**	-0.11
Weekend trips closer to home	0.16*	-0.23**	0.17*	-0.12
Change to a more efficient car	0.15*	-0.05	0.16*	0.05
<i>Food</i>				
Eat less meat	0.20**	-0.16*	0.14	-0.19**
Eat more organic produce	0.18*	-0.13	0.18*	-0.04
Eat more locally produced food	0.13	-0.14	0.23**	-0.03
Eat more seasonal produce	0.13	-0.21**	0.26**	-0.05
Eat more free range fish/meat	0.14	-0.16*	0.20**	-0.04
Eat or drink more Fair Trade	0.22**	-0.28**	0.32**	-0.20**

*Correlation is significant at the 0.05 level (two-tailed).

**Correlation is significant at the 0.01 level (two-tailed).

Table 6 | Relationship between values and perceived ease of adopting a range of pro-environmental behaviours

	Environmental concern	Materialism	Altruism/biospherism	Egoism
<i>Energy</i>				
Use less gas and electricity	0.23**	0.05	0.16*	0.04
Replace equipment	0.14	-0.08	0.16*	0.09
Replace light bulbs	0.26**	-0.04	0.08	-0.01
Technology for green energy	0.07	0.04	0.11	0.09
Sign up to green tariff	0.22**	-0.17*	0.08	-0.08
Turn down heating	0.22**	0.01	0.18*	0.05
Install insulation	0.07	-0.03	0.08	0.16*
Turn off lights	0.21**	0.02	0.06	0.06
Unplug equipment not in use	0.16*	-0.07	0.11	0.05
<i>Transport</i>				
Drive less	0.09	-0.04	0.14	0.02
Cycle more	0.13	0.09	0.09	0.13
Use more public transport	0.13	-0.03	0.25**	0.09
Avoid travelling by plane	0.11	-0.09	0.21**	0.05
Weekend trips closer to home	0.15*	-0.08	0.21**	-0.08
Change to a more efficient car	0.18*	-0.05	0.09	-0.02
<i>Food</i>				
Eat less meat	0.18*	-0.10	0.09	-0.03
Eat more organic produce	0.21**	0.03	0.11	0.03
Eat more locally produced food	0.22**	-0.02	0.18*	0.06
Eat more seasonal produce	0.22**	-0.03	0.22**	0.02
Eat more free range fish or meat	0.17*	0.03	0.15*	0.07
Eat/drink more Fair Trade	0.27**	-0.05	0.21**	-0.04

*Correlation is significant at the 0.05 level (two-tailed).

**Correlation is significant at the 0.01 level (two-tailed).

concern and materialism is stronger than the relationship with general values. Generally, it appears that the more likely people are to have strong environmental concern, the more likely they are to say they intend to adopt a range of pro-environmental behaviours, particularly some home energy and food-related behaviours. Moreover, the more materialistic respondents are, the less likely they are to say they intend to adopt these behaviours and in particular transport and some food-related behaviours.

Table 6 shows that the relationship between environmental concern and perceptions of how easy or difficult it is to adopt pro-environmental behaviours is largely similar as for intentions. People who express strong environmental concern believe it is easier to adopt most behaviours than people who do not (except for adopting green energy, installing insulation and driving less). Virtually no relationship has

been found between materialism and these behaviours. This implies that people with high levels of materialism may be less inclined to behave pro-environmentally but they do not necessarily think it is more difficult to do so.

Table 7 reiterates the findings presented in Tables 5 and 6. It shows that the intentions to adopt pro-environmental behaviours are positively related to environmental concern and altruistic values and negatively to materialism and egoistic values. These relationships, however, are not strong; no more than 16% of the variance in intentions can be explained by the values. The percentage of explained variance for perceived difficulty is even smaller, suggesting that the relationship between values and perceived difficulty to adopt pro-environmental behaviours is small, although significant. The table also shows that environmental concern is positively related to intentions and perceived difficulty, and

Table 7 | Relationship between values and intentions to adopt pro-environmental behaviours (results of regression analyses)

	Intention	Difficulty
% explained variance	16%	11%
	$F = 18.29 (2187), p < 0.001$	$F = 12.93 (2185), p < 0.01$
Materialism	-0.26**	0.01
Environmental concern	0.26**	0.35**
	13%	7%
	$F = 15.24 (2190), p < 0.001$	$F = 8.22 (2188), p < 0.001$
Egoism	-0.11	0.06
Altruism/biospherism	0.36	0.28

Note: Regression weights presented in the table indicate the unique correlation between the two relevant variables, controlled for the correlation between the dependent variable (importance) and the other independent variables. Beta weights can range from 0 (no relationship) to 1 (perfect relationship). * $p < 0.05$ (relationship is significant at the 95% confidence level), ** $p < 0.01$ (99% confidence level).

materialism is negatively related to intentions but not to perceived difficulty. However, as the tables above reveal, this relationship did vary depending on the specific behaviours.

Well-being

The extent to which respondents felt satisfied with their life is related to materialism. Respondents with stronger materialism are more likely to report a lower level of well-being ($r = -0.29, p < 0.001$). Reported well-being is not related to any of the other variables in this study such as perceived importance of possessions, intentions to adopt pro-environmental behaviours or activities. However, two small significant correlations are found, which suggest that those who spent more time playing sports report slightly higher well-being ($r = 0.15, p < 0.05$) and those who spent more time with friends report slightly higher well-being ($r = 0.16, p < 0.05$). However, as these are only two significant correlations out of a large number of possible tests (one for each behaviour), these findings should be interpreted with care.

CONCLUSION

We are living in an increasingly materialistic society where the acquisition of wealth and material possessions are perceived and presented as important life goals. At the same time there is increasing concern about the environmental damage current levels of consumerism cause. This article explored the extent to which people are concerned about both materialistic pursuits and environmental protection and how these values relate to consumer behaviour, pro-environmental behaviour and well-being. The respondents in the study expressed strong concern for environmental issues and much less concern for acquiring wealth and possessions (materialism). However, we did not find that people who expressed high environmental concern were necessarily less materialistic or vice versa. At least in

this study these two potentially conflicting values (one promoting consumerism, the other promoting conservation) do not appear to reflect one underlying dimension such as self-enhancement versus self-transcendence (e.g. Schwartz, 1992) or materialism–postmaterialism (e.g. Inglehart, 1990). The extent to which respondents express materialistic and environmental concerns are related, but only weakly. Materialism and environmental concern appeared to be related in different ways to different consumer variables. The more importance respondents attached to materialistic aspects in life, the more importance they tended to attach to possessions that are associated with higher direct and indirect energy use (such as TVs, mobile phones and cars), the less importance they attached to possessions associated with relatively low energy or energy conservation, and the less likely they were to say they intended to adopt a range of pro-environmental behaviours, particularly behaviours related to transport and (to some extent) food. The more value respondents placed on environmental issues, the more importance they attached to low-energy possessions and the more likely they were to say they intended to adopt a range of pro-environmental behaviours (particularly home energy use). However, environmental concern was not related to the importance attached to possessions associated with relatively high energy use.

This suggests that, at least for these variables, materialism and environmental concern may have conflicting and different influences. This is potentially problematic as it was shown that many people hold both values simultaneously. In this study, people therefore appear to be motivated by consumption as well as conservation. This has important implications for the promotion of sustainable lifestyles. Sustainable lifestyles imply household behaviour patterns with a relatively low use of energy and materials. Such lifestyles cannot be created if individuals are trying hard on the one hand to adopt pro-environmental behaviours but at the same time adopt behaviours that outdo any beneficial

environmental consequences of such behaviour. This potential conflict between environmental and materialistic values should form an important focus point for interventions that aim to promote energy conservation in households.

The relationship between general values and behaviours was generally weaker than the relationship between materialism and environmental concern and behaviour. This is in line with the suggestion of Stern and Dietz (1994) that general values relate to more specific values, which in turn relate to general attitudes, specific attitudes, intentions and behaviours. The conceptual distance between values and behavioural intentions is therefore larger and one would not expect to find very strong correlations. The strength of the relationships found in this study is similar to that found in previous research (e.g. Stern, 2000; De Groot and Steg, 2008).

An interesting finding in this research was that although egoistic and biospheric values were not related and materialistic and environmental concerns were weakly related, a strong relationship was found between altruism and biospherism. In fact, this relationship was so strong that it was decided to combine these values into one value domain. A relationship between altruism and biospherism has been found elsewhere (e.g. De Groot and Steg, 2007, 2008). This relationship again raises interesting questions for the promotion of sustainable lifestyles for which it may be valuable to focus not only on environmental or biospheric aspects but also on social and altruistic aspects (see also Pepper *et al.*, 2009).

In support of previous research, materialism was negatively related to well-being (e.g. Burroughs and Rindfleisch, 2002; Kasser, 2002). At least in this study there was no indication as to the nature of this relationship. Kasser *et al.* (2004) proposed two paths to materialistic value internalization: experience of insecurity and exposure to social models that promote materialism. In support of this, some research has found that materialism is related to more TV viewing (Chaplin and John, 2007; Saunders, 2007). However, causal conclusions cannot, of course, be drawn on the basis of such correlational data. This study did not find a relationship between materialism and TV viewing, but we did find a number of other relationships between materialism and time spent on activities such as shopping and playing computer games. Particularly the relationship with computer use may deserve further attention in order to better understand the nature of this relationship and its potential causes and consequences.

The sample of respondents in this study is not representative of the UK household population. Although care was taken to include people from different socio-demographic groups, the context of the study has created a sample biased towards the purchase of consumer products in DIY stores. Moreover, participants were aware that they are participating in a one-year intensive study that aims to promote energy conservation in the home. When

respondents were asked what kinds of behaviours they were planning to adopt or what changes they were planning to make in their households in response to participation in the project, most respondents referred to buying products for their households that would allow them to save energy. Very few respondents indicated that they would attempt to consume less or buy less. We do not know whether this is a generalizable finding, whether it is specific to the respondent group in this study or whether it is related to the context of the study. For future research it would be useful to examine whether this sample has been biased towards buying themselves out of the ecological crisis or whether this is a more general perception among UK households. This is particularly interesting in the context of materialism and environmental concern. If people are motivated by materialism and environmental concern, would it be possible to promote conservation behaviour by addressing conservation and reduction of consumption as well as by addressing materialism and promoting the purchase of more energy-efficient and environmentally friendly products? Research on materialism suggests that in order for people to use and desire material objects to cope with potential issues of insecurity (Kasser, 2002), it is essential that the symbolic value of these possessions is recognized. Existing research has shown that the reasons for valuing possessions are related to expressing, maintaining and signalling self-concept to others (e.g. Csikszentmihalyi and Rochberg-Halton, 1981; Belk, 1985; Dittmar, 1992; Jackson, 2005). In the current study correlations between materialism and the importance attached to environmental products, however, were mainly negative, suggesting that this route would only be an option if the symbolic 'status' value of environmentally friendly products was improved.

This research has shown that different values and concerns are related to consumer attitudes and behavioural intentions in different ways. The findings suggest that whereas people are motivated by environmental concern to reduce their consumption of energy and materials, they also have material concerns that motivate them to purchase new products and increase their environmental impact. In order to promote more sustainable lifestyles, it is important, therefore, not only to promote environmental awareness and concern but also, as Jackson (2009) suggests, to address material concerns, which requires looking at the larger value context in which actions are situated (Rätzsch and Uzzell, 2009).

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