

This is the author's accepted manuscript of an article that was published in the Journal of Marketing Management on 28 July 2015. The version of record has the following doi: 10.1080/0267257X.2015.1061039

Advancing sustainable consumption in the UK and China: The mediating effect of pro-environmental self-identity

Prof. Janine Dermody*
Oxford Brookes University, UK
Faculty of Business
Oxford
OX33 1HX
Tel: +44 (0)1865 48 54 88
Email: jdermody@brookes.ac.uk

Dr Stuart Hanmer-Lloyd
University of Gloucestershire, UK
Business School
The Park
Cheltenham
GL50 2RH
Tel: +44 (0) 1242 714876
Email: shlloyd@glos.ac.uk

Dr Nicole Koenig-Lewis
Cardiff Business School, UK
Cardiff University
Aberconway Building (Office D18),
Colum Drive, Cardiff, CF10 3EU
Tel: +44 (0)29 2087 4674
Email: koenig-lewisn@cardiff.ac.uk

Dr Anita Lifen Zhao
School of Management, Swansea University, UK
Singleton Park (Haldane 125)
Swansea University, Swansea, SA2 8PP
Tel: +44 (0) 1792 295601
Email: a.l.zhao@swansea.ac.uk

Acknowledgements:

This research study was funded by the University of Gloucestershire Business School. We particularly thank Professor Stephen Hill (Acting Dean 2014-15) for his support in securing this funding.

We are also very grateful to Eva Oller, Account Executive, Survey Sampling International and Catalin Balint, Lead Project Manager, Survey Sampling International. Their attention to detail and care with collecting the data was outstanding – thank you.

This study complies with the ethics codes of The University of Gloucestershire.

**corresponding author*

Advancing sustainable consumption in the UK and China: The mediating effect of pro-environmental self-identity

Abstract

In this paper we respond to the call for more holistic and culturally diverse research to advance understanding of (non)sustainable consumption behaviour. Our conceptual model incorporates materialism, environmental concern, social consumption motivation, pro-environmental self-identity and sustainable consumption behaviours. This paper contributes to knowledge by examining the mediating role of pro-environmental self-identity to more fully explain consumers' (non)sustainable consumption behaviour. An international online panel survey was employed in the UK (n=1037) and China (n=1025). Findings show that pro-environmental self-identity partially or fully mediates the relationships between materialism, environmental concern, social consumption motivation and sustainable consumption behaviours. Important cultural differences also emerged, for example the positive effect of materialism on Chinese consumer's sustainable consumption, which is contrary to Western evidence. We suggest bolder, culturally-informed and more reflexive marketing strategies are needed to significantly advance sustainable consumption, thus effectively helping to redress the crisis facing our planet.

Statement of contribution:

To our knowledge this is the first study examining the mediating role of pro-environmental self-identity in the relationship between materialism, social consumption motivation, environmental concern and sustainable consumption behaviour for British and Chinese consumers. The direct and indirect effects were tested using the SPSS macro syntax PROCESS adopting bootstrapping procedures, an approach which has only recently received increased attention. We have also responded to current research limitations in sustainable consumption by adopting a multi-cultural and more holistic research approach entailing Eastern vs. Western consumers and multiple behaviours and concepts.

Keywords: East-West cultures, environmental concern, materialism & social consumption motivation, pro-environmental self-identity, sustainable consumption, sustainability marketing

Advancing sustainable consumption in the UK and China: The mediating effect of pro-environmental self-identity

The challenge of consuming sustainably

The behaviour of mankind is having a devastating effect on the earth's capacity to support and nurture all her life forms; and this is particularly evident in the voracious appetite of consumers in their consumerism behaviour. The connections between consumerism and accelerated climate change are becoming increasingly visible, with the United Nations Intergovernmental Panel on Climate Change (2007, 2013) stating the evidence of accelerated global warming is incontrovertible, and more recent warming is essentially attributable to human activity (90+%). There is also evidence to indicate that the depletion of the earth's natural resources over the last century, many of which are finite, can be fully assigned to human behaviour (Krausmann et al., 2009; Vlek & Steg, 2007). The consequences of this are catastrophic for all species inhabiting the planet; triggering the WWF (2008) to assert that *“our globe's ‘ecological credit crunch’ is actually the most urgent crisis of our time.”*

Addressing this crisis is one of the most exigent behavioural change challenges of modern history. Thus the need to transform consumption behaviour into more sustainable choice-making is fundamental in helping to solve our planet's ecological crisis. This is because the more citizenly orientation of sustainable consumption facilitates its capacity to (1) increase the life chances of more people and the planet by equalising the distribution of resources to increase quality-of-life, (2) integrate the needs of future generations into current choice-making by not excessively using resources and (3) reduce the negative environmental impact of over-consumption and consumerism to significantly minimise ecological destruction.

The contribution of sustainable consumption resides in its more citizenly perspective of fairness, equality and stewardship (Peatie & Peattie, 2009; Prothero et al., 2011), where

individuals only consume their ‘earth share’ of the planet’s resources (Peattie & Collins, 2009). In practice this entails “*the use of goods and services that respond to basic needs and bring a better quality of life, while minimising the use of natural resources, toxic materials and emissions of waste and pollutants over the life cycle, so as not to jeopardise the needs of future generations.*” (Oslo Roundtable on Sustainable Production and Consumption 1994). Whilst not made explicit within this definition, sustainable consumption also embraces consumption reduction, curtailment and anti-consumption practices (Prothero, et al., 2011; Zavestoski, 2002).

Accordingly sustainable consumption entails varying levels of consumer commitment. Within the lower commitment spectrum, consumers maintain their existing utilitarian and identity-construction consumption levels by consuming products and services whose production, use and disposal are premised on the responsible management of resources. A deeper commitment necessitates consumers redefining their needs and identity(s) as they reduce their consumption levels, or cease to consume specific products and services regardless of their environmental credentials. This deeper commitment is more difficult to achieve because it triggers political and economic nervousness. Thus the consumption reduction, curtailment and anti-consumption attributes of sustainable consumption are fundamentally perceived as a threat to the dominant social paradigm (DSP) (Pirages & Ehrlich, 1974) of resource-intensive, self-gratification consumerism through materialism. It is this ideology that promotes pervasive economic growth in both Eastern and Western nations. This DSP-sustainability friction not only generates political and economic unease, it also highlights a potential personality disorder for marketing. Hence marketing is a major protagonist of consumption excess, with scant regard for the future, whilst also being identified as part of the ‘solution’ in encouraging more sustainable consumption practices

(Kotler, 2011; Mitchell, Wooliscroft, & Higham, 2010): albeit within an agenda of consumption intemperance, not curtailment or non-consumption.

It is therefore not surprising that consumers are reluctant to consume more sustainably, even when they are aware of environmental problems and concerned about them. The majority are not willing to *dramatically* change their consumption behaviour to help resolve these problems, or even to modify it beyond low commitment behaviours such as recycling (Kilbourne & Pickett, 2008; Prothero, et al., 2011; Rettie, Burchell, & Riley, 2012). While lower commitment to sustainable consumption has some merit, fundamentally sustainable consumption that embraces curtailment and reduction (not just eco-efficiency to maintain consumption levels) is vital because it is a strong and effective force in facilitating human, social and ecological wellbeing and supporting policy-making for behavioural and economic change. This goal of strong sustainable consumption, as advocated by Lorek and Fuchs (2013), is critical in ensuring long-term behavioural change. The challenge of achieving it, however, is significant and it is likely to take decades to achieve, not least because it creates political and economic timescale tensions (Soron, 2010). Fundamental to this transformation is the need for more advanced research. This, however, is also not without its challenges, which we now illuminate.

The research challenge and our research contribution

Research has a major contribution to make in facilitating the transition towards increasing and strengthening sustainable consumption behaviours. However, this is being undermined by a single conceptual focus within much sustainable consumption research, even though sustainable consumption is influenced by innumerable interconnected micro and macro influences. Consequently there is an increasingly vocal call for more holistic research that can proffer broader theoretical and behaviourally integrated explanations of consumers' adoption

or rejection of sustainable consumption choice-making (Chabowski, Mena, & Gonzalez-Padron, 2011; Wells, Ponting, & Peattie, 2011). For example, Prothero et al (2011, p. 31) remark that “future research approaches to this interdisciplinary topic must be comprehensive and systematic and would benefit from a variety of different perspectives”.

Furthermore, there is the dearth of cross-cultural research that explores cultural differences within the realms of sustainable consumption (e.g. Leonidou, Leonidou, & Kvasova, 2010; Steg, Bolderdijk, Keizer, & Perlaviciute, 2014; Sudbury Riley, Kohlbacher, & Hofmeister, 2012). This dominance of Western thinking in research is partially reflected in the call for more holistic research (above). Overall the lack of cross-cultural research is limiting advances in understanding; particularly given environmental problems are of global concern. We have responded to these limitations by designing our study as a multi-country, multiple-construct and multi-behavioural research investigation. In this paper we report our findings from the UK and China with reference to the constructs of materialism, environmental concern, social consumption motivation and pro-environmental self-identity and sustainable consumption ‘purchasing’ behaviours.

Pro-environmental self-identity lies at the core of our study because self-identity is a major predictor of consumption choice-making (Belk, 2010). Whilst not extensively applied to sustainable consumption, it is significant in explaining pro-environmental behaviour, and its influence is stronger than attitudes and values (Sparks & Shepherd, 1992). Our contribution therefore lies in applying pro-environmental self-identity to more fully explain consumers (non)sustainable consumption behaviour. We strengthen this contribution by appraising the mediating effect of pro-environmental self-identity between materialism, social consumption motivation and environmental concern and sustainable consumption. We selected materialism and social consumption motivation because they represent the importance consumers attach to the acquisition and ownership of possessions and their

ensuing social status. Materialism in particular can impede pro-environmentalism, although newer research suggests this effect, cross-culturally is inconsistent (Strizhakova & Coulter, 2013). Hence its contrasting effect on sustainable consumption in different cultures merits fuller investigation. Environmental concern signals how environmentally knowledgeable and willing consumers are to engage with sustainability through their consumption choices. It is considered to offer major insight into why consumers consume (un)sustainably; however research causality can be weak (Thøgersen, 2000) requiring further investigation. Combined, given their potential behavioural impacts, the interconnections between them are of considerable interest; yet there is very little research exploring this. To our knowledge this is the first study examining the relationships between these constructs and their influence on sustainable consumption behaviours in two contrasting cultures - UK and China. Our unique contribution is increased by our appraisal of pro-environmental self-identity as a mediator.

Overall our broader theoretical, behavioural and cultural approach enables us to enhance understanding of (non)sustainable consumption behaviour and to advance marketing in contributing to solutions for behavioural change. In addition, we employ the SPSS macro syntax PROCESS adopting bootstrapping procedures to test a model's predictive validity, an approach which has only recently received increased attention. We thus respond to a call for research to move beyond multiple regression analysis and structural equation modelling which exclusively rely on tests for model fit (Woodside, 2013). We now present a more detailed account of the conceptual foundations of our research.

Conceptual foundations of our research study

Materialism and social consumption motivation

Within Western scholarship, materialism is frequently regarded as a values orientation that, according to Richins (2004), represents the importance consumers confer on the acquisition

and ownership of their possessions. This acquisition enables them to achieve their major life goals or end state of happiness. This materialistic values orientation is triggered by self-doubt and the fear of social rejection. Thus possessions are perceived to be the key to happiness. Accordingly materialists define themselves by what they own, giving higher status to their acquisitions than they give to their experiences or relationships with other people (Rindfleisch, Burroughs, & Wong, 2009). Richins and Dawson (1992) maintain this materialistic orientation is represented by three dimensions. These are success (materialists judge their own and others success by the possessions they own), happiness (the pursuit & acquisition of possessions are central to wellbeing and success of materialists) and centrality (the importance materialists attach to gaining possessions). These elements can be fulfilled through the social communicative value of possessions, which enable materialists to portray their social status and convey their pleasure in their acquisitions to others – as signs of their success and happiness and the centrality of their materialistic consumption. Within our study we have adopted this values orientation conceptualisation of materialism, with its three dimensions of success, happiness and centrality.

Materialism is of interest in exploring the (non)adoption of sustainable consumption because it exerts such a strong influence on consumer behaviour, thus it is the “dominant consumer ideology” (Belk, 1987, p. 26) in modernised and developed economies (McCracken, 1988) – in line with the Western DSP discussed above. With the widespread pursuit of economic growth and prosperity, materialism is also increasing in developing, historically less-capitalistic cultures, such as China, where we are witnessing a rapidly evolving avaricious appetite for material possessions amongst Chinese consumers (Hao, 2014; Podoshen, Li, & Zhang, 2011). Consequently, investigating materialism cross-culturally can enhance understanding of its meaning(s) and effects (Hurst, Dittmar, Bond, & Kasser, 2013) and thus the potential to generate significant insights for marketing in

advancing the adoption of sustainable consumption across cultures (Clarke & Micken, 2002; Strizhakova & Coulter, 2013). However, a more culturally diverse examination of materialism (and social consumption motivation) is still limited; therefore a Western perspective of materialism continues to dominate current thinking.

Research evidence on Western cultures shows that materialism significantly undermines pro-environmental behaviour, including sustainable consumption (Kilbourne & Pickett, 2008) and thus creates long-term negative consequences for society and consumers (Burroughs & Rindfleisch, 2002), akin to issues surrounding the dominance of the DSP. This is because materialists perceive acquiring wealth and possessions to be essential to their lives, crucial for their happiness and indispensable for their success (and that of others) (Kilbourne & Pickett, 2008; Richins & Dawson, 1992). Self-interest governs their choice-making, which is prioritised over concerns surrounding environmental, human or social capital. Thus we propose the following hypothesis:

H1: Materialism has a negative impact on sustainable consumption behaviour.

There is an indication that the relationship between materialism and pro-environmental behaviour differs in Eastern cultures (Strizhakova & Coulter, 2013). Thus it will be interesting to observe whether materialism has a negative effect on the sustainable consumption behaviour of both our British and Chinese samples.

The acquisition drive for centrality, happiness and success, can partially be explained through social consumption motivation which represents the importance materialists attach to the social status of their possessions in portraying their success and happiness. Materialists are motivated by the judgements of others who are appraising their potential and actual acquisitions. This includes how they feel others will judge them as well as actual evaluations. Accordingly social consumption motivation is concerned with the images of brands and the images of other people who buy/use the brand (Fitzmaurice & Comegys, 2006). Thus it is

associated with social status and social identity. Whilst Fitzmaurice and Comegys (2006) confirmed a significant positive relationship between materialism and social consumption motivation, the link between social consumption motivation and actual behaviour is far less clear from the literature and might also be context specific. For example, Moschis (1981) suggests that social consumption motivation enables materialists ownership of possessions to be successfully conveyed to others, thereby portraying the social meanings inherent within their choices, which transfer as part of materialists social identity. Therefore social consumption motivation might have a positive influence on sustainable consumption because of its social visibility in signalling a pro-environmental attitude to significant others, e.g. in-groups, or, in China, facilitating 'face' (*mien-tsu*). Vermeir and Verbeke (2008), for example, found that perceived social influence has a highly significant positive impact on sustainable food consumption intention. We therefore hypothesise, for both UK and China:

H2: Social consumption motivation has a positive impact on sustainable consumption behaviour.

Environmental concern

Environmental concern entails individuals being aware of environmental problems and demonstrating their willingness to personally support and/or engage in solutions to help resolve these problems (Dunlap & Jones, 2002). Environmental concern has been regarded as a major explanation of why individuals do or do not engage in sustainability-orientated behaviours (Hartmann & Apaolaza-Ibáñez, 2012; Kilbourne & Pickett, 2008); hence its inclusion in our study.

Early research results, however, indicate a low/moderate relationship between environmental concern and environmental behaviour (Hines, Hungerford, & Tomera, 1986; Thøgersen, 2000). This was because environmental concern was conceptualised as a

collection of perceptions, emotions, knowledge, attitudes, values and behaviours (Bamberg, 2003) with their ensuing measurement challenges (Dunlap, Van Liere, Mertig, & Jones, 2000). Accordingly environmental concern has been simplified to reflect a general attitude encompassing the cognitive and affective appraisal of environmental problems; with antecedents in environmental perception, knowledge and values (Bamberg, 2003). We adopt this conceptualisation in our research investigation.

While causality issues still remain embedded in this conceptualisation, the research of Bamberg (2003) illustrates how environmental concern might act as a more *indirect* source of influence on situation-specific sustainability-orientated behaviours. Viewed in this way, environmental concern has the capacity to become an easy-access heuristic that enables consumers to make sustainable consumption choices that illustrate their environmental awareness and commitment within their 'normal realms of consumption'. There is evidence for this from Koenig-Lewis, Palmer, Dermody and Urbye (2014), who confirmed that general environmental concern is a main factor in predicting consumer purchase intention for a carbonated soft-drink utilising ecologically responsible packaging.

Identifying the influence of environmental concern is very pertinent in China because of growing concern over China's economic expansion and its negative impact on the environment (Hao, 2014; Harris, 2006). Whilst China has enjoyed rapid economic development for over three decades, its environmental problems have only recently been given attention (Xiao, Dunlap, & Hong, 2013). For example BBC news reported that in 2013, China's per capita carbon emissions exceeded that of the EU (McGrath, 2014). The recently published 2014 Environmental Performance Index (Yale Center for Environmental Law & Policy, 2014) has shown that, compared to the UK's 12th position, China is ranked 118th out of 178 participating countries; even though China has improved her environmental performance. How concerned then, is China about her environmental problems? Xiao et al.

(2013), in their appraisal of the 2003 Chinese General Social Survey, emphasise that even though global environmental concern for China is growing, there is a need to investigate and monitor the degree of environmental concern amongst Chinese citizens and thus their perceptions of environmental problems and protection. Currently there are only a few national-level surveys of public perceptions and opinions amongst the Chinese public in relation to environmental issues (Xiao, et al., 2013). Our research thus contributes to advancing this evidence base.

Overall environmental concern appears to positively influence sustainable consumption behaviour, although its effects are less well understood, and even less so in contrasting cultures. Accordingly we propose the following hypothesis for the UK and China:

H3: Environmental concern has a positive impact on sustainable consumption behaviour.

Pro-environmental self-identity

Pro-environmental self-identity refers to individuals possessing a sense of self that embraces pro-environmental actions (van der Werff, Steg, & Keizer, 2013b). This invocation of ‘self’, through behaviour, for example *‘I am a recycler’* rather than *‘I recycle’*, is a key motivator in individuals’ adoption of social causes (Bryan, Adams, & Monin, 2013; Oyserman, 2009).

Accordingly, pro-environmental self-identity is of significant importance in understanding why consumers consume (un)sustainably. This is because evidence consistently portrays self-identity as a significant predictor of consumption choices (Belk, 2010; Thorbjørnsen, Pedersen, & Nysveen, 2007; Whitmarsh & O’Neill, 2010), with a stronger influence on consumer choice-making than attitudes or values (Gatersleben, Murtagha, & Abrahamseb, 2012). This is not surprising given the self-expressive nature of consumption that entails consumers’ desire to build or enhance their self-identity through their consumption choices (see for example Belk, 2010; Sparks & Shepherd, 1992;

Thorbjørnsen, et al., 2007). Thus solutions to encourage the adoption of sustainable consumption behaviours must be premised on understanding that consumption is symbolically important to consumers' identity construction and preservation, and thus their sense of individual and social self (Dolan, 2002; Soron, 2010). Thus marketing can play an important role in encouraging behavioural change through its capacity to invoke the symbolic dimension of sustainable consumption practices as part of pro-environmental identity-construction.

We suspect, compared with Western consumers, Chinese conception of self is less individualistic and more relational, focusing on the interdependency between social relationships, cultural norms and mien-tsu; albeit shades of individualism (via materialism) have become embedded within the identities of Chinese youth (Chan & Zhang, 2007). It is therefore pertinent to examine these iterations of self in relation to sustainable consumption.

While self-identity has not been extensively applied to sustainable consumption (Schaefer & Crane, 2005), it has been found to be a strong predictor of pro-environmental behaviour, for example recycling, energy reduction. This is because it 'regulates' consistency between our attitudes and behaviours and thus continuity across our experiences (Whitmarsh & O'Neill, 2010), it has symbolic credentials, like other forms of consumption (Dolan, 2002; Soron, 2010), and ultimately because it conveys individuals active sense of 'pro-environmental self' through their sustainable consumption practices. Pro-environmental self-identity is, therefore, a key explanatory construct in helping to explain a spectrum of individual and collective (spillover) sustainable consumption behaviours of pro-environmental consumers (Clayton, 2012; Fielding, McDonald, & Louis, 2008; Kashima, Paladino, & Margetts, 2014; van der Werff, et al., 2013b; Whitmarsh & O'Neill, 2010). This account of pro-environmental self-identity is based on Western cultures predominantly. Little evidence currently exists examining the effect of pro-environmental self-identity on the

sustainable consumption behaviours of more Eastern cultures, and specifically China. Thus, our study will make a unique contribution to enhancing this knowledge. With respect to China and the UK, we therefore propose our fourth hypothesis:

H4: Pro-environmental self-identity has a positive impact on sustainable consumption behaviour.

Mediating effects

A number of recent articles have provided tentative support for the mediating role of pro-environmental self-identity between values, environmental preferences and behaviour (Gatersleben, et al., 2012; van der Werff, et al., 2013b; Whitmarsh & O'Neill, 2010). We therefore suggest that pro-environmental self-identity will be influenced by the values of materialism, social consumption motivation (via social value of acquisitions) and environmental concern. We propose the following hypotheses to test these influences, with respect to China and the UK:

H5: Materialism has a negative impact on pro-environmental self-identity.

H6: Social consumption motivation has a positive impact on pro-environmental self-identity.

H7: Environmental concern has a positive impact on pro-environmental self-identity.

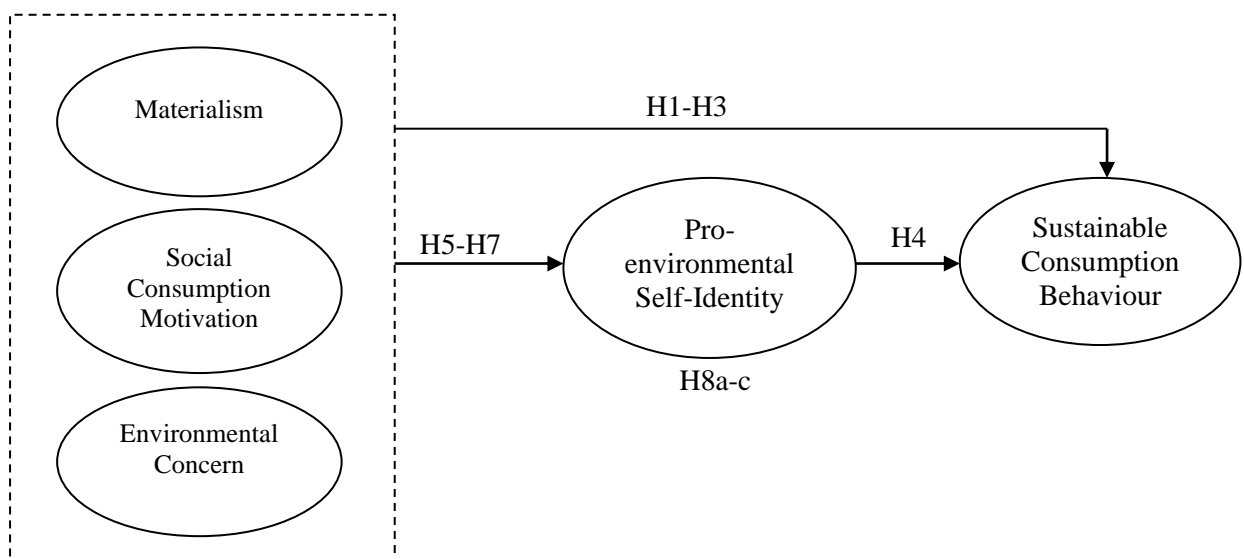
More recently, van der Werff, Steg and Keizer (2014) demonstrated that environmental self-identity mediates the relationship between past pro-environmental activities and subsequent pro-environmental preferences; hence initial pro-environmental actions may lead to subsequent pro-environmental preferences and behaviour. Therefore, it is reasonable to expect that pro-environmental self-identity mediates the relationship between our antecedents of materialism, social consumption motivation, environmental concern, through their links to values and sustainable consumption behaviours. We propose environmental concern and social consumption motivation are more likely to lead to sustainable consumption behaviour,

the more they align with pro-environmental self-identity. Whilst the negative influence of materialism on sustainable consumption behaviour will decrease with higher pro-environmental identity. Our final hypotheses test these potential mediating effects for both the UK and China:

H8: Pro-environmental self-identity mediates the effect of (a) materialism, (b) social consumption motivation and (c) environmental concern on sustainable consumption behaviour.

The conceptual model of our study is presented in figure 1.

Figure 1: Conceptual Model



Method

Sample and procedures

To collect data for the study, an online survey panel approach was employed. The online survey was hosted and released by Survey Sampling International (SSI), who recruited respondents from their online panel in the UK and in China. Online panels are increasingly used in market research in the context of sustainable consumption (Polonsky, Vocino, Grau,

Garma, & Ferdous, 2012; Wells, et al., 2011). SSI tested the online surveys, before a stratified sampling with quotas applied on stratas was employed to ensure the representativeness of the participants of the general UK population in terms of gender, age, education, and income.

Data were collected during June-July 2014 and the final sample of our study comprised of 1,037 adults from the UK and 1,025 adults from China. The panel provider ensured respondent authentication, eliminated those respondents who provided identical responses to all questions and who completed the survey too fast, and also ensured that participants completed the survey fully and only once. Appendix 1 provides the demographic profile of the study sample compared to national census data where available. Our UK sample yielded high agreement with the general population in terms of gender, age, education and employment level. The Chinese sample mimics the Chinese population in terms of gender (48.7% female) and broadly age, but due the sampling procedure (i.e. using a national online panel) over-represents more educated and higher income persons, which is however, in line with other studies (Thøgersen & Zhou, 2012).

Data analysis

Data analysis occurred in three stages. First, we tested the psychometric properties of each construct by applying exploratory (EFA) and confirmatory factor analysis (CFA) to assess the reliability and validity of the scales employed in this study (Gerbing & Hamilton, 1996). Second, independent samples t-tests are applied to assess differences in the means of our constructs between UK and China. Third, the direct and indirect effects of the conceptual model were tested using the SPSS macro syntax PROCESS presented in Hayes (2013) which allows estimation of both indirect and interaction effects using bootstrapping procedures based on generating multiple random samples. Simulation studies confirm that bootstrapping

is more powerful than the original Baron and Kenny (1986) method of testing mediation by using the causal steps approach and has several advantages over the Sobel test (Cheung & Lau, 2008; Williams & MacKinnon, 2008). The bootstrap method lacks the normality assumption and provides stronger accuracy in confidence intervals (Preacher & Hayes, 2008). In addition, bootstrapping procedures also test a model's predictive validity and it is thus not surprising that the bootstrapping approach has received increasing attention in recent year (Hayes, 2009).

Measures

Materialism (MAT) was measured using 18 items from the well-established Material Values Scale (Richins & Dawson, 1992). Environmental concern (EC) was measured with four items adapted from Ellen et al. (1991). Four-items measuring social consumption motivation (SCM) were adopted (Moschis, 1985; Moschis & Churchill, 1978). The pro-environmental self-identity (PESI) scale used in this study consisted of five items adapted from Whitmarsh and O'Neill (2010) and Roberts (1996). All four constructs were measured on a five-point Likert scale (1=strongly disagree, 5=strongly agree). 5 sustainable consumption 'purchasing' behaviours (SCB), adapted from Whitmarsh and O'Neill (2010), were measured on a five-item five-point Likert scale ranging from 1=never, 2=occasionally, 3=often, 4=nearly-always and 5=always (see appendix B). This approach is in line with the literature (Whitmarsh, 2011) which indicates that sustainable consumption behaviour may be defined as actions, frequencies and measures of an individual's environmental decision as well as engagement.

Measurement validation

We first tested measurement validity individually in each country. Preliminary EFA analyses confirmed the presence of our underlying constructs with the exception of materialism.

Similar to previous research recording measurement problems with materialism items in cross-cultural contexts (Griffin, Babin, & Christensen, 2004; Strizhakova & Coulter, 2013), we found a number of items cross-loading on more than one dimension and yielding low factor loadings. This further supports Richins (2004) who has questioned the dimensionality of materialism, namely, the factor structure derived from empirical data does not always reflect the conceptual structure of materialism i.e. three dimensions of happiness, success and centrality. As proposed by Richins (2004) and applied by Griffin et al. (2004) who also experienced measurement problems, we have reduced the scale to the shortened 6-item scale before conducting CFA for both samples.

The final measurement models revealed good fit for both contexts (UK: $\chi^2(154)=462.23$, $p \leq .001$, $\chi^2/df= 3.00$, CFI=.963, TLI=0.955, RMSEA=.044, China: $\chi^2(154)=509.58$, $p \leq .001$, $\chi^2/df= 3.309$, CFI=.947, TLI=0.935, RMSEA=.048). Due to low standardised factor loadings of below .5, one item was dropped from the materialism scale, one item for the environmental concern scale and two items were removed from the pro-environmental self-identity scale. Next, we applied a multi-group CFA to establish configural and metric invariance (Steenkamp & Baumgartner, 1998). The multi-group measurement model demonstrated acceptable fit ($\chi^2(308)=971.81$, $p \leq .001$, $\chi^2/df= 3.16$, CFI=.956, TLI=0.946, RMSEA=.032). All factor loadings were significant and all correlations were below .7 with the exception of the correlation between materialism and social consumption motivation in the UK which was .72 (only slightly above the recommended value), thus largely supporting configural invariance. Full metric invariance was assessed by comparing a constrained model, i.e. all factor loadings are constrained to be equal across the two countries, with an unconstrained model. As the commonly used $\Delta\chi^2$ is highly sensitive to sample size, we assessed ΔCFI in testing for invariance due to its superiority as recommended in the literature (Cheung & Rensvold, 2002; Meade, Johnson, & Braddy,

2008). Full metric invariance was established as $\Delta CFI = -.006$ between the two models was well below the recommended value of $-.01$ (Cheung & Rensvold, 2002).

Furthermore, our latent variables confirmed convergent validity as all individual item factor loadings were above $.5$ and significant ($p < .001$) (Anderson & Gerbing, 1988). Discriminant validity is supported with the square root of the Average Variance Extracted (AVE) for each construct exceeding the corresponding inter-construct correlations for all constructs in our study with one exception (Fornell & Larcker, 1981). The squared AVE ($.63$) of materialism in the UK sample was slightly smaller than the correlation between those two constructs ($.72$). Construct reliabilities, squared AVEs and Pearson correlation coefficients are displayed in Table 1. Composite variables for each construct were calculated by averaging across the items for further analyses.

Table 1: Composite reliability, square root of AVEs and Pearson r correlations for UK and China

Construct	CR UK	CR China	MAT	SCM	EC	PESI	SCB
MAT	.76	.78	.63 (.64)	.72**	-.27**	n.s.	.11**
SCM	.87	.80	.61**	.79 (.71)	-.24**	.08*	.24**
EC	.68	.82	-.18**	-.18**	.65 (.78)	.61**	.35**
PESI	.80	.77	.45**	.42**	.20**	.75 (.71)	.69**
SCB	.84	.78	.47**	.44**	.09*	.65**	.72 (.65)

Note: Values in the diagonal represent square root of AVE for the UK (China in brackets), values above the diagonal represent correlations for the UK sample, whilst values below the diagonally represent correlations for the Chinese sample. * $p < .05$, ** $p < .001$

Common Method Variance

As our study examines constructs from the same source employing a single methodology, it could raise concerns regarding Common Method Variance (CMV). To address this and minimise the potential impact of common method biases, several recommended procedures were followed (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Firstly, the use of an online survey was to ensure the anonymity of the responses and thus reduce possible socially

desirable responses. Secondly, the order of the questions was mixed and different scale formats were applied (Chang, Witteloostuijn, & Eden, 2010). Thirdly, the result from the post-hoc Harman one-factor analysis revealed that no single factor explained an excessively large portion of variance (Chang, et al., 2010) and the examination of the correlation matrix showed no highly correlated variables (Bagozzi, Yi, & Phillips, 1991). On the basis of these results, CMV was deemed not to be a significant threat in our study.

Results

Descriptive findings in relation to cross-cultural differences

The results from independent samples t-tests as shown in Table 2, indicate significant differences between UK and China with regards to materialism ($t=-22.52$, $p<.001$), social consumption motivation ($t=-41.37$, $p<0.001$), environmental concern ($t=-11.96$, $p<0.001$), pro-environmental self-identity ($t=-18.34$, $p<0.001$) and sustainable consumption behaviour ($t=-28.5$, $p<0.001$). Significantly higher levels of materialism and social consumption motivation were found in the Chinese sample, in contrast to the UK sample. However, somewhat unexpectedly, the Chinese respondents also expressed significantly more environmental concern, showed significantly higher levels of pro-environmental self-identity, and were significantly more often committed to sustainable consumption behaviours.

Table 2: Means, standard deviation and t-test results

Variables	Means (SD)		t	df	p-value
	UK	China			
MAT ¹	2.80 (.79)	3.55 (.71)	-22.52	2040.85	.000
SCM ¹	2.19 (.88)	3.65 (.71)	-41.37	1976.77	.000
EC ¹	3.21 (.77)	3.67 (.94)	-11.96	1978.48	.000
PESI ¹	3.46 (.74)	4.00 (.60)	-18.34	1977.79	.000
SCB ²	2.56 (.77)	3.49 (.70)	-28.50	2060	.000

¹ Scale: 1-5, ranging from 'strongly disagree/strongly agree'; a higher means indicates higher agreement with the statement.

² Scale: 1-5, ranging from 'never, occasionally, often, nearly-always and always'; a higher score is an indicative of a greater level of environmental behaviour.

Hypotheses Testing

Direct effects

To test the proposed relationships in the conceptual model (Figure 1), a simple mediation model (Hayes, 2013) was employed. PROCESS estimates the direct and indirect effects and generates bias-corrected 95% confidence intervals (CI) for the indirect effects of each antecedent variable. Materialism, environmental concern and social-consumption motivation were entered in the equation at the first step, and the hypothesised mediator (pro-environmental self-identity) was included in the second step. An examination of the variance inflation factors (VIFs) showed that no values were above 1.6 and thus confirms that multicollinearity is very low. The results show that the antecedents in the first equation accounted for 13% (UK) and 19% (China) of the variance in sustainable consumption behaviour. Adding pro-environmental self-identity led to a significant increase in the variance explained in sustainable consumption behavior to 35% in the UK and 31% in China (UK: $R^2=.35$, $\Delta R^2=.22$, $p<.001$; China: $R^2=.31$, $\Delta R^2=.11$, $p<.001$).

Table 3: Direct effects of antecedents on SCB and PESI

Dependent variable SCB	UK			China		
	<i>B</i>	<i>SE</i>	<i>t-value</i>	<i>B</i>	<i>SE</i>	<i>t-value</i>
Antecedents						
MAT	-.015	.031	-.48	.169	.033	5.07**
SCM	.155	.030	5.12**	.145	.034	4.23**
EC	.038	.033	1.14	.042	.022	1.93
PESI	.555	.033	16.95**	.444	.042	10.64**
R^2	.350			.308		
F statistic	124.01**			96.45**		
Dependent variable: PESI	UK			China		
	<i>B</i>	<i>SE</i>	<i>t-value</i>	<i>B</i>	<i>SE</i>	<i>t-value</i>
Antecedents						
MAT	-.064	.034	-1.91	.213	.031	6.83**
SCM	.156	.030	5.15**	.224	.032	7.13**
EC	.463	.030	15.27**	.150	.020	7.64**
R^2	.236			.221		
F statistic	91.11**			80.34**		

Note: ** denotes significant at $p<.001$

As can be seen from Table 3, significant cultural differences between the UK and China exist with regards to the influence of materialism. This significant difference was also confirmed by the results of a moderated mediation analysis which shows a significant interaction effect between the country and the direct effect of materialism on sustainable consumption behaviours ($b=.178$, $p<.000$). For the UK sample, the direct effect of 'materialism' was negative, although not significant ($B=-.015$, $p>.05$), whilst for the Chinese sample, a positive significant relationship between materialism and sustainable consumption behaviour was observed ($B=.169$, $p<.001$). In other words, the more materialistic the Chinese respondents were, the higher their sustainable consumption behaviours. Thus H1 was rejected for both countries.

The influence of social consumption motivation was significant, positive and of similar size for both nations (UK: $B=.155$, $p<.001$, China: $B=.145$, $p<.001$), thus supporting H2. Environmental concern had no direct significant positive influence on sustainable consumption behaviours in both nations (UK: $B=.038$, $p>.05$, China: $B=.042$, $p>.05$), thus no support was found for H3. The results demonstrate a positive significant influence of pro-environmental self-identity on sustainable consumption behaviour for both samples (UK: $B=.555$, $p<.001$, China: $B=.444$, $p<.001$), supporting H4. Thus higher levels of pro-environmental self-identity lead to higher levels of sustainable consumption behaviours.

As shown in Table 3, the R-square for predicting pro-environmental self-identity was .24 ($F=91.11$) for the UK sample and .22 ($F=80.34$) for the Chinese sample. Materialism had no significant effect on pro-environmental self-identity for the UK sample ($B=-.064$, $p<.057$), but for the Chinese sample materialism had a significant positive influence on pro-environmental identity ($B=.213$, $p<.001$). Thus no support was found for H5. H6 and H7 were confirmed for both countries, as social consumption motivation (UK: $B=.156$, $p<.001$, China: $B=.224$, $p<.001$) and environmental concern (UK: $B=.463$, $p<.001$, China: $B=.150$,

$p < .001$) had positive significant effect on pro-environmental self-identity. In addition, the results of the applied moderated mediation analysis for each antecedent confirmed that the differences between UK and China are significant. We found significant interaction effects between the country and the direct effect of materialism ($b = .370$, $p < .000$), social consumption motivation ($b = .259$, $p < .000$) and environmental concern ($b = -.361$, $p < .000$) on pro-environmental self-identity.

Indirect effects

The mediating role of pro-environmental self-identity in the relationship between the antecedents and sustainable consumption behaviour was assessed by examining the bias-corrected confidence intervals derived from the SPSS-macro syntax PROCESS. We used 5,000 iterations to derive 95% confidence intervals (Preacher & Hayes, 2004). The indirect effect is significant if no zero is included in the 95% confidence interval.

Table 4: Bootstrap results for indirect effects

	Value	SE	LL 95% CI	UL 95% CI	Mediation Results
UK					
MAT	-.036	.018	-.072	.001	No mediation
SCM	.086	.018	.053	.123	Partial mediation
EC	.257	.022	.216	.302	Full mediation
China					
MAT	.094	.016	.066	.128	Partial mediation
SCM	.099	.016	.070	.132	Partial mediation
EC	.067	.010	.088	.048	Full mediation

As shown in Table 4, when assessing the UK sample, the true indirect effect of materialism on sustainable consumption behaviour via pro-environmental self-identity is estimated to lie between $-.072$ and $.001$ with 95% confidence and is thus not significant as zero is included in the 95% confidence interval (Preacher & Hayes, 2004). Therefore H8a cannot be confirmed for the UK sample. However, for the Chinese sample, the mediating effect of pro-environmental self-identity on the relationship between materialism and

sustainable consumption behaviour was significant ($b=.094$, 95% [.066, .128], $p<.001$). This difference between UK and China is significant, confirmed by our results from the moderated mediation analysis, which showed a significant interaction effect for the indirect effect of materialism on sustainable consumption behaviour ($b=.178$, $p<.000$). As the direct effect of materialism on sustainable consumption behaviour in the Chinese sample was also significant (see Table 2), only partial mediation is confirmed in the Chinese sample.

Results supported H8b, with pro-environmental self-identity mediating the relationship between social consumption motivation and sustainable consumption behaviour in both countries (UK: $b=.086$, 95% [.053, .123], $p<.001$; China: $b=.099$, 95% [.070, .132], $p<.001$). However, due to the significant direct effect of social consumption motivation on sustainable consumption behaviour when controlling for mediation, only partial mediation of pro-environmental identity could be confirmed for both samples.

The bootstrap method indicated a significant mediation effect of pro-environmental self-identity on the relationship between environmental concern and sustainable consumption behaviour for both samples, thus supporting H8c (UK: $b=.257$, 95% [.216, .302], $p<.001$; China: $b=.067$, 95% [.088, .048], $p<.001$). For both samples, full or indirect-only mediation is supported as environmental concern had no direct influence on sustainable consumption behaviour.

Discussion

We now consider the implications of our findings, contrasting our UK and China data in relation to our research hypotheses.

How do China and the UK compare on materialism, social consumption motivation, environmental concern, pro-environmental self-identity and sustainable consumption behaviour?

Our Chinese respondents differed from the UK in their higher levels of materialism and social consumption motivation. Thus we contribute to the small evidence base suggesting consumers from emerging markets are more materialistic compared with developed countries. They have a higher propensity to display their acquisitions to others (IPSOS, 2013; Sharma, 2011) and far greater self-inflicted pressure than Europeans to acquire money, enabling them to define their success by what they own. Indeed this disposition for materialistic acquisitions and the motivation to display them for social status is notably high in China (IPSOS, 2013), symbolising the hyper-expansion of China's economy. At the same time Hurst et al. (2013) suggest Chinese consumers pursuit of extra wealth may positively relate to important well-being factors including satisfaction of core psychological needs. Examples include success and happiness, which facilitate the gaining of 'face' (mien-tsu). Thus materialism may be perceived differently in China compared with the UK.

In addition to being high materialists, our Chinese respondents showed significantly more environmental concern, pro-environmental self-identity and sustainable consumption behaviour compared with our UK respondents. Their higher environmental concern may reflect the reality of their every-day living with a higher number of problems like environmental pollution. For example seven out of the ten most air-polluted cities are located in China (Staedter, 2013). Consequently these problems are more 'real' in China compared

with the UK and Western nations and subsequently more emotional in their generation of fear and anxiety concerning ecology, health and well-being. In the UK, while individuals frequently witness unfolding environmental problems through the media, they are more distant. This contrast between China and the UK may also indicate differing understanding and meanings associated with environmental problems and sustainability. For example, in the West sustainability messages typically relate to private behaviours (e.g. individuals switching off their computers), whilst in China they are more related to her Government and industrialisation via her economic development. Consequently behaviours to address sustainability problems in China tend to be more collective, driven by her Government policy; whilst in the UK they are more individualistic and potentially more susceptible to disingenuous 'green' marketing. This affirms why it is so important to have a deeper understanding of the cultural influences on the (non)sustainability choice making of consumers.

In relation to Hypotheses 1, 2 and 3, our Chinese and UK respondents were similar in both the influence of social consumption motivation (for reasons discussed above) and the non-influence of environmental concern on their reported sustainable consumption behaviours. With respect to our rejection of H3, it is interesting that the effect of environmental concern on sustainable consumption is superseded by pro-environmental self-identity. This adds credence to the importance of pro-environmental self-identity in more fully understanding why consumers do and do not consume sustainably.

The Eastern and Western differences between materialism and sustainable consumption merit further appraisal. The dominant viewpoint in Western literature suggests a negative relationship between materialism and sustainable consumption reflecting the competing ideologies between market-growth (the DSP) and sustainability. However, our China results show a positive relationship between materialism and sustainable consumption; reflecting a

consumer population focused on the acquisition of possessions and their social status, who are also environmentally concerned. This positive effect may indicate different meanings of materialism in China, representing different global cultural identities, as illustrated by Hurst et al. (2013), Strizhakova and Coulter (2013) and Unanue (2010). As Shrum et al. (2014) and Griskevicius, Tybur and Van den Bergh (2010) suggest, this positive relationship represents identity status signals to others and self, especially when sustainable products are more costly and publicly consumed in. This apparent contradiction exists because economic growth priorities and strategies adopted by many global companies to produce so called 'environmentally responsible' or 'carbon-neutral' products, suggests to consumers they can continue to consume materialistically without damaging the planet. This is currently being described as the "green side" of materialism and is particularly prevalent in emerging markets like China. With its conflicting philosophy, however, it is short-term, irresponsible and high risk.

Hypothesis 4 concerned the relationship between pro-environmental self-identity and sustainable consumption behaviour. Our UK and China results support prior evidence that pro-environmental self-identity has a positive significant influence on sustainable consumption behaviour (Fielding, et al., 2008; van der Werff, Steg, & Keizer, 2013a; Whitmarsh & O'Neill, 2010). Importantly, whilst this has been widely reported in the Western literature, no previous research has been identified for China. Following the ideas of Belk (2010) amongst others, sustainable consumption behaviour may be symbolically self-expressive in portraying consumers sense of their 'pro-environmental self' in both Western and Eastern cultures. We add a note of caution, however, because the self identity(s) can vary between cultures (Chan & Zhang, 2007). Thus, for the UK, pro-environmental self may well be reflecting an individualistic orientation. Whilst for China it could be portraying a more relational interplay between social ties, cultural norms and mien-tsu in addressing

environmental problems for the ‘common good’. The nature and influence of pro-environmental self-identity in Eastern cultures therefore merits fuller exploration.

What is the relationship between materialism, social consumption motivation, environmental concern and pro-environmental self-identity?

Hypotheses 5, 6 and 7 investigated the relationship between materialism, social consumption motivation, environmental concern and pro-environmental self-identity. Notwithstanding our comments above on the meanings of identity between cultures, the results generally fitted our overall pattern of findings. Namely, the Chinese materialism results identified a significant positive influence on pro-environmental self-identity, which contrasts with the UK and other Western data. Potential explanations for this have been elucidated above.

In relation to social consumption motivation, this was positively linked with pro-environmental self-identity for both our Chinese and UK respondents. This enables them to socially display their commitment to sustainability through their consumption behaviour, suggesting the socially symbolic dimension of identity is an important consideration in this relationship. However the results for environmental concern showed a different outcome between China and the UK. Our UK data indicated environmental concern had no significant effect on pro-environmental self-identity, supporting the findings of Bamberg (2003) and Dunlap et al. (2000); whereas the Chinese respondents reported a significant positive effect. Steg, Bolderdijk, Keizer and Perlaviciute (2014) remind us that situational factors/cues influence what individuals find important in life and the strength of their life goals, which affects the choices they make. Thus, for China, as discussed above, this positive effect may be partially explained by their greater immersion in living with the reality of environmental pollution as a result of their economic growth. Perhaps this triggers a greater propensity to invoke pro-environmental self as a collective action to begin to ‘survive’ and overcome this

reality, in line with the ideas of Bryan et al. (2013) and Oyserman et al. (2009). For the UK environmental issues may not be of primary concern because (1) there is an element of unreality and distance about them, (2) within the mindset of the DSP, technology and science will provide solutions, (3) there are other more pressing (and more real) matters causing concern, e.g. UK recession and austerity measures.

Does pro-environmental self-identity mediate the effect of materialism, social consumption motivation and environmental concern on sustainable consumption behaviour?

Hypotheses 8 a, b, c, investigated the possible mediating effect of pro-environmental self-identity, as identified within our model in Figure 1. Our findings for both China and the UK support existing evidence that pro-environmental self-identity plays a mediating role between sustainable consumption behaviour and values (Gatersleben, et al., 2012; van der Werff, et al., 2013b; Whitmarsh & O'Neill, 2010). However, our findings expand this affiliation, through our three antecedents of materialism, social consumption motivation and environmental concern. In all but one of the cases pro-environmental self-identity was confirmed as a full or partial mediator in that relationship. Thus we advance understanding of the underlying influences on sustainable consumption behaviour. Furthermore, whilst studies have shown each of our antecedents influence sustainable consumption behaviour directly, our findings reveal their explanatory power has been significantly enhanced through the mediating variable of pro-environmental self-identity (UK: 13% increased to 35%; China: 19% increased to 31%). Consequently our study provides strong evidence to support the argument that pro-environmental self-identity is an important predictor of sustainable consumption choice-making, thus supporting our conceptual model. This strengthens the argument for 'identity campaigning' as a potential route for promoting sustainable consumption behaviour, as well as challenging currently extant materialistic values.

We now move on to consider the implications of our findings in significantly enhancing marketing practice.

Conclusion: advancing marketing's contribution to fortifying sustainable consumption

We draw upon our overarching key results in presenting our marketing conclusions, particularly those prudent to increasing and strengthening sustainable consumption behaviour. Firstly, marketing, as currently practiced, feeds consumer desire for possessions as they (re)construct their identities, resulting in an increasingly materialistic society with associated self-enhancement values and reduced sustainability considerations. Secondly, our Chinese and UK findings are similar in terms of absolute levels of materialistic values and behaviour, but, importantly, different in their connection with sustainability. Thus, the Chinese respondents linked their materialistic values positively with their environmental concern and their sustainable consumption as well as their environmental self-identity. This is in direct contrast to our UK respondents and to Western evidence. Thirdly, in exploring sustainable consumption behaviour through our multi-construct model, the mediating role of pro-environmental self-identity became apparent and significant for both the UK and Chinese respondents. This supports the primary role pro-environmental self-identity plays in influencing sustainable consumption behaviour.

Accordingly our evidence signals a bolder and more differentiated marketing response is needed than is currently practiced by many environmental charities and Government bodies. This reflects McDonagh & Prothero's (2014) assertion for the need to address the wider systemic and institutional issues embedded within marketing.

This more ambitious approach is needed for two reasons. Firstly to compete with the "green" marketing strategies of global companies who advocate consumption beyond individuals 'earth share', whilst presenting this as environmentally/ethically responsible and

thus acceptable. The positive relationship between sustainable consumption behaviour, self-identity and materialism and environmental concern of our Chinese respondents is symptomatic of this misaligned approach. Secondly, the limitations of current marketing by environmental campaigners need to be recognised. These initiatives essentially focus on specific activities, ranging from installing low-energy light bulbs and switching computers off overnight, to saving the whale campaigns. However evidence suggests “spill over” effects to other environmental activities is quite limited (Crompton & Kasser, 2010). As David McKay, former Chief Scientific Advisor at the UK Department of Energy and Climate change asserted: *“Don’t be distracted by the myth that ‘every little bit helps’. If everyone does a little, we’ll achieve only a little.”* (McKay, 2008, p. 114).

Thus, a more significant and consistent marketing campaign by Governments and charity coalitions is urgently needed to fundamentally address the sustainability issue through individuals’ values and self-identity. Otherwise, as Gatersleben et al. (2012, p. 4) observe *“unless these deeper constructs [of values and identities] are engaged, any change towards pro-environmental behaviour will be piecemeal, slow and disjointed”*. This increases the risk of rebound (sustainability behaviour in one domain, thus less in another e.g. carbon trading), undermining any gains made (Crompton & Kasser, 2010; Druckman, Chitnis, Sorrell, & Jackson, 2011). This approach directly challenges many global corporations’ marketing strategies and individual countries’ economic growth strategies. The myth of “green” materialism emerging in BRIC markets (Strizhakova & Coulter, 2013) needs to be exploded. We realise we are setting a major challenge for governments, companies, environmental campaigners and researchers, thus we offer ideas to help them to reorientate their future strategies and actions.

Firstly, Governments must help shape the nations’ values by addressing the causes and dominance of intensely consumerist values in contemporary society, which feeds desire for

materialistic self-identity through possessions. Economic growth, for its own sake, becomes questionable, so Governments need to choose appropriate strategies that genuinely and significantly support sustainability criteria (Jackson, 2009). For example Governments need to redirect how sustainable consumption is being marketed by companies - consume 'green' but not less is unacceptable. Changing how corporations market and position themselves as environmentally responsible is particularly problematic but must be addressed. The onus is more likely to be on Governments, environmental agencies, researchers and others to help drive this new orientation. This will take time and is embedded in a reappraisal of nation's materialistic values and the resulting adaptation of market driven organisations.

Inherent within this, our research shows that China, whilst moving towards increased materialistic and consumerist values, does not share a similar pathway to this destination with the West. Thus cultural tailoring of marketing strategies for sustainability is essential. As Thøgersen and Zhou (2012) attest, it is critical that China does not repeat the mistakes of the West and embed unfulfilling and unsustainable consumerism into her values and norms. This necessitates intense action from all stakeholders. China could set the benchmarks for the West to follow, reflecting a fundamental political shift in West versus Eastern influence.

In conjunction with this, the role of education in society becomes critical in enabling teachers to appraise, with children, alternatives to marketing's mainstream portrayal of consumerist values and identity. Curriculums need to enable children to 'experience nature'; helping them to develop their environmental self-identity and thus a stronger disposition to protect the natural environment (Crompton & Kasser, 2010). Governments need to seriously support these endeavours. Environmental agencies must advocate a more holistic approach to the sustainability problem to enable a change in societal values away from self-enhancement (financial success, image and fame) (Brown & Kasser, 2005) towards self-transcendence. Self-transcendence entails personal growth, close relationships with family

and community well-being, hence is closely aligned with the philosophy of sustainability. These agencies will need to genuinely work together alongside other likeminded organisations to achieve this impact. Coalitions may be an effective way forward, but they will require bold and innovative leaders to achieve success. Researchers should play a key role in this reorientation by providing evidence to underpin and justify the actions of these central decision makers (above). Important questions remain to be answered. Indeed, the role and impact of marketing on society needs to be deeply re-evaluated if we are really to achieve the sustainability goals required for our planet's survival.

Finally, it is our contention, based on our research and existing scholarship, that a more confrontational marketing approach from Governments and environment agencies is needed to dramatically strengthen global sustainable consumption behaviours. Existing paradigms that continue to create more materialistic and consumerist societies should not go unchallenged at the deeper level. Values need to be changed and self-identity modification strategies have a key role to play in this process. Understanding the multi-cultural dimensions involved also needs to be recognised. We hope that our research will help to foster this vital holistic approach to enable sustainability to truly sit at the core of all mankind's future aspirations and endeavours.

Theoretical implications and further research

Whilst we recognise that our research is premised on reported behaviours rather than observed behaviours, which itself merits further research, several other areas can clearly be identified. Our research highlights the importance of identifying different cultural understandings of Western concepts, such as materialism. However, further research is needed to explore these 'meanings' in more depth, thus recognising the relevance of the context within which the research takes place.

While we signal the significant mediating role of pro-environmental self-identity in explaining sustainable consumption behaviour, this relationship and its connection with environmental concern, social consumption motivation and materialism require deeper appraisal (alongside other antecedents). This includes how identity can act as a barrier to sustainable consumption, as well as how pro-environmental identity is developed. It would also be interesting to explore if other identities facilitate the adoption of sustainable consumption behaviours, for example identity as a ‘good citizen’. Fuller understanding of culturally different meanings of pro-environmental self-identity is also vital; not least because promoting pro-environmental self-identity as a priority within a person’s hierarchy of salience remains a key task for environmental communicators (and this also needs further investigation).

Fuller research exploration of the meanings of sustainability and sustainable consumption, from different cultural perspectives, is essential. Research will also be needed to identify how multi-cultural stakeholders can globally work together in addressing our planets ecological and human problems; recent failings from environmental summits illustrate how critical this is. Therefore, in line with other authors (Hurst, et al., 2013; Kovácsa et al., 2014), we stress the urgent need for much more research of this nature to facilitate more global but differentiated approaches to promoting sustainable consumption behaviour. Generating solutions to global sustainability problems requires this magnitude of research evidence, evaluation and reflexivity.

REFERENCES

- Anderson, J. C., & Gerbing, D. W. (1988). Structural Equation Modeling in Practice: A Review and Recommended Two-Step Approach. *Psychological Bulletin*, *103*(3), 411-423. doi: 10.1037/0033-2909.103.3.411
- Bagozzi, R. P., Yi, Y., & Phillips, L. W. (1991). Assessing Construct Validity in Organizational Research. *Administrative Science Quarterly*, *36*(3), 421-458.
- Bamberg, S. (2003). How does environmental concern influence specific environmentally related behaviors? A new answer to an old question. *Journal of Environmental Psychology*, *23*, 21-32. doi: 10.1016/S0272-4944(02)00078-6
- Baron, R. M., & Kenny, D. A. (1986). the moderator-mediator variable distinction in social psychological research: conceptual, strategic and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173-1182. doi: 10.1037/0022-3514.51.6.1173
- Belk, R., W. (1987). Material values in the comics: a content analysis of comic books featuring themes of wealth. *Journal of Consumer Research*, *14*(1), 26-42. doi: 10.2307/2489240
- Belk, R., W. (2010). The ineluctable mysteries of possessions. *Journal of Social Behavior and Personality*, *6*(6), 17-55.
- Brown, K. W., & Kasser, T. (2005). Are psychological and ecological well-being compatible? The role of values, mindfulness, and lifestyle. *Social Indicators Research*, *74*(2), 349-368. doi: 10.1007/s11205-004-8207-8
- Bryan, C. J., Adams, G. S., & Monin, B. (2013). When cheating would make you a cheater: Implicating the self prevents unethical behavior. *Journal of Experimental Psychology: General*, *142*(4), 1001-1005. doi: 10.1037/a0030655
- Burroughs, J. E., & Rindfleisch, A. (2002). Materialism and well-being: a conflicting values perspective. *Journal of consumer Research*, *29*(3), 348-370. doi: 10.1086/344429
- Chabowski, B. R., Mena, J. A., & Gonzalez-Padron, T. L. (2011). The structure of sustainability research in marketing, 1958-2008: a basis for future research opportunities. *Journal of the Academy Marketing Science*, *39*(1), 55-70. doi: 10.1007/s11747-010-0212-7
- Chan, C., & Zhang, C. (2007). Living in a celebrity-mediated social world: the Chinese experience. *Young Consumers*, *8*(2), 139-152. doi: 10.1108/17473610710757509
- Chang, S.-J., Witteloostuijn, A. V., & Eden, L. (2010). From the Editors: Common method variance in international business research. *Journal of International Business Studies*, *41*, 178-184. doi: 10.1057/jibs.2009.88

- Cheung, G. W., & Lau, R. (2008). Testing Mediation and Suppression Effects of Latent Variables Bootstrapping With Structural Equation Models. *Organizational Research Methods, 11*(2), 296-325. doi: 10.1177/1094428107300343
- Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural equation modeling, 9*(2), 233-255.
- Clarke, I. I., & Micken, K. S. (2002). An exploratory cross-cultural analysis of the values of materialism. *Journal of International Consumer Marketing, 14*(4), 65-89. doi: 10.1300/J046v14n04_05
- Clayton, S. (2012). *Handbook of environmental and conservation psychology*. Oxford University Press: Oxford.
- Crompton, T., & Kasser, T. (2010). Human identity: a missing link in environmental campaigning. *Environment: Science and Policy for Sustainable Development, July-August*. Retrieved from <http://www.environmentmagazine.org/Archives/Back%20Issues/July-August%202010/human-identity-full.html>
- Dolan, P. (2002). The sustainability of sustainable consumption. *Journal of Macromarketing, 22*(2), 170-181. doi: 10.1177/0276146702238220
- Druckman, A., Chitnis, M., Sorrell, S., & Jackson, T. (2011). Missing carbon reductions? Exploring rebound and backfire effects in UK households. *Energy Policy, 39*(6), 3572-3581. doi: 10.1016/j.enpol.2011.03.058
- Dunlap, R. E., & Jones, R. E. (2002). Environmental Concern: Conceptual and Measurement Issues. In R. E. Dunlap & W. Michelson (Eds.), *Handbook of Environmental Sociology* (pp. 482-524). Westport, London: Greenwood Press.
- Dunlap, R. E., Van Liere, K. D., Mertig, A. G., & Jones, R. E. (2000). Measuring Endorsement of the New Ecological Paradigm: A Revised NEP Scale. *Journal of Social Issues, 56*(3), 425-442. doi: 10.1111/0022-4537.00176
- Ellen, P. S., Wiener, J. L., & Cobb-Walgren, C. (1991). The role of perceived consumer effectiveness in motivating environmentally conscious behaviors. *Journal of Public Policy & Marketing, 10*(2), 102-117.
- Fielding, K. S., McDonald, R., & Louis, W. R. (2008). Theory of planned behaviour, identity and intentions to engage in environmental activism. *Journal of Environmental Psychology, 28*(4), 318-326. doi: 10.1016/j.jenvp.2008.03.003
- Fitzmaurice, J., & Comegys, C. (2006). Materialism and social consumption. *Journal of Marketing Theory, 14*(4), 287-299. doi: 10.2753/MTP1069-6679140403

- Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Errors. *Journal of Marketing Research*, 18 (February), 39-50.
- Gatersleben, B., Murtagha, N., & Abrahamseb, W. (2012). Values, identity and pro-environmental behaviour. *Contemporary Social Science: Journal of the Academy of Social Sciences*, 1-19. doi: 10.1080/21582041.2012.682086
- Gerbing, D. W., & Hamilton, J. G. (1996). Viability of exploratory factor analysis as a precursor to confirmatory factor analysis. *Structural Equation Modeling: A Multidisciplinary Journal*, 3(1), 62-72. doi: 10.1080/10705519609540030
- Griffin, M., Babin, B. J., & Christensen, F. (2004). A cross-cultural investigation of the materialism construct: Assessing the Richins and Dawson's materialism scale in Denmark, France and Russia. *Journal of Business Research*, 57(8), 893-900. doi: 10.1016/S0148-2963(02)00290-4
- Griskevicius, V., Tybur, J. M., & Van den Bergh, B. (2010). Going Green to Be Seen: Status, Reputation, and Conspicuous Conservation. *Journal of Personality and Social Psychology*, 98 (3), 392-404.
- Hao, F. (2014). The effect of economic affluence and ecological degradation on Chinese environmental concern: a multilevel analysis. *Journal of Environmental Studies Sciences*, 4(2), 123-131. doi: 10.1007/s13412-014-0166-z
- Harris, P. G. (2006). Environmental perspectives and behavior in China: Synopsis and bibliography. *Environment and Behavior*, 38(1), 5-21. doi: 10.1177/0013916505280087
- Hartmann, P., & Apaolaza-Ibañez, V. (2012). Consumer attitude and purchase intention toward green energy brands: The roles of psychological benefits and environmental concern. *Journal of Business Research*, 65(9), 1254-1263. doi: 10.1016/j.jbusres.2011.11.001
- Hayes, A. F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs*, 76(4), 408-420. doi: 10.1080/03637750903310360
- Hayes, A. F. (2013). *Introduction to mediation, moderation and conditional process analysis*. New York: The Guildford Press.
- Hines, J., M., Hungerford, H. R., & Tomera, A. N. (1986). Analysis and synthesis of research on responsible environmental behavior: A meta-analysis. *Journal of Environmental Education*, 18(2), 1-8. doi: 10.1080/00958964.1987.9943482

- Hurst, M., Dittmar, H., Bond, R., & Kasser, T. (2013). The relationship between materialistic values and environmental attitudes and behaviors: A meta-analysis. *Journal of Environmental Psychology, 36*(December), 257-269. doi: 10.1016/j.jenvp.2013.09.003
- Intergovernmental Panel on Climate Change. (2007). Intergovernmental Panel on Climate Change: Fourth Assessment Report (AR4). Retrieved from www.ipcc.ch/publications_and_data/ar4/syr/en/contents.html
- Intergovernmental Panel on Climate Change. (2013). Summary for policymakers Q. D. Stocker TF, Plattner G-K et al (Ed.) *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* Retrieved from http://www.climatechange2013.org/images/report/WG2011AR2015_SPM_FINAL.pdf
- IPSOS. (2013). Global Attitudes on Materialism, Finances and Family. Retrieved from <http://www.ipsos-na.com/news-polls/pressrelease.aspx?id=6359>
- Jackson, T. (2009). *Prosperity without growth: economics for a finite planet*. Oxon, UK: Earthscan.
- Kashima, Y., Paladino, A., & Margetts, E. A. (2014). Environmentalist identity and environmental striving. *Journal of Environmental Psychology, 38*, 64-75. doi: 10.1016/j.jenvp.2013.12.014
- Kilbourne, W. E., & Pickett, G. (2008). How materialism affects environmental beliefs, concern, and environmentally responsible behavior. *Journal of Business Research, 61*(9), 885-893. doi: 10.1016/j.jbusres.2007.09.016
- Koenig-Lewis, N., Palmer, A., Dermody, J., & Urbye, A. (2014). Consumers' evaluations of ecological packaging - Rational and emotional approaches. *Journal of Environmental Psychology, 37*(March), 94-105. doi: 10.1016/j.jenvp.2013.11.009
- Kotler, P. (2011). Reinventing marketing to manage the environmental imperative. *Journal of Marketing, 75*(4), 132-135. doi: 10.1509/jmkg.75.4.132
- Kovácsa, J., Pántyaa, J., Medvésa, D., Hidegkutia, I., Heima, O., & Bursavichb, J. B. (2014). Justifying environmentally significant behavior choices: An American-hungarian cross-cultural comparison. *Journal of Environmental Psychology, 37*, 31-39. doi: 10.1016/j.jenvp.2013.11.001
- Krausmann, F., Gingrich, S., Eisenmenger, N., Erb, K. H., Haberl, H., & Fischer-Kowalski, M. (2009). Growth in global materials use, GDP and population during the 20th century. *Ecological Economics, 68*(10), 2696-2705. doi: 10.1016/j.ecolecon.2009.05.007

- Leonidou, L. C., Leonidou, C. N., & Kvasova, O. (2010). Antecedents and outcomes of consumer environmentally friendly attitudes and behaviour. *Journal of Marketing Management*, 26(13-14), 1319-1344. doi: 10.1080/0267257x.2010.523710
- Lorek, S., & Fuchs, D. (2013). Strong sustainable consumption governance - precondition for a degrowth path? *Journal of Cleaner Production*, 38, 36-43. doi: 10.1016/j.jclepro.2011.08.008
- McCracken, G. D. (1988). *Culture and consumption*. Bloomington: Indiana University Press.
- McDonagh, P., & Prothero, A. (2014). Sustainable marketing research: past, present and future. *Journal of Marketing Management*, 30(11-12), 1186-1219. doi: 10.1080/0267257X.2014.943263
- McGrath, M. (2014). China's per capita carbon emissions overtake EU's, *BBC*. Retrieved from <http://www.bbc.co.uk/news/science-environment-29239194>
- McKay, D. J. C. (2008). *Sustainable Energy - Without the Hot Air*. Cambridge, UK: UIT.
- Meade, A. W., Johnson, E. C., & Braddy, P. W. (2008). Power and sensitivity of alternative fit indices in tests of measurement invariance. *Journal of Applied Psychology*, 93(3), 568-592. doi: 10.1037/0021-9010.93.3.568
- Mitchell, R. W., Wooliscroft, B., & Higham, J. (2010). Sustainable Market Orientation: A New Approach to Managing Marketing Strategy. *Journal of Macromarketing*, 30(2), 160-170. doi: 10.1177/0276146710361928
- Moschis, G. P. (1981). Socialization perspectives and consumer behavior. In B. Enis & K. Roering (Eds.), *Marketing Review* (pp. 43-45). Chiacago: American Marketing Association.
- Moschis, G. P. (1985). The Role of Family Communication in Consumer socialization of children and adolescents. *Journal of consumer Research*, 11(4), 898-913.
- Moschis, G. P., & Churchill, G. A. J. (1978). Consumer socialization: a theoretical and empirical analysis. *Journal of Marketing Research*, 15(4), 599-609.
- Norwegian Ministry of the Environment. (1994). Oslo Roundtable on Sustainable Production and Consumption. Retrieved from <http://www.iisd.ca/consume/oslo000.html>
- Oyserman, D. (2009). Identity-based motivation and consumer behavior. *Journal of Consumer Psychology*, 19(3), 276-279. doi: 10.1016/j.jcps.2009.06.001
- Peatie, K., & Peattie, S. (2009). Social marketing: A pathway to consumption reduction? *Journal of Business Research*, 62(2), 260-268. doi: 10.1016/j.jbusres.2008.01.033

- Peattie, K., & Collins, A. (2009). Guest editorial: Perspectives on sustainable consumption. *International Journal of Consumer Studies*, 33(2), 107-112. doi: 10.1111/j.1470-6431.2009.00758.x
- Pirages, D. C., & Ehrlich, P. R. (1974). *Ark II: Social Response to Environmental Imperatives*. San Francisco: Freeman.
- Podoshen, J. S., Li, L., & Zhang, J. F. (2011). Materialism and conspicuous consumption in China: a cross-cultural examination. *International Journal of Consumer Studies*, 35(1), 17-25. doi: 10.1111/j.1470-6431.2010.00930.x
- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioural research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5), 879-903. doi: 10.1037/0021-9010.88.5.879
- Polonsky, M., Vocino, A., Grau, S., Garma, R., & Ferdous, A. (2012). The impact of general and carbon-related environmental knowledge on attitudes and behaviour of US consumers. *Journal of Marketing Management*, 28(3/4), 238-263. doi: 10.1080/0267257X.2012.659279
- Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, 36(4), 717-731. doi: 10.3758/BF03206553
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, 40(3), 879-891. doi: 10.3758/BRM.40.3.879
- Prothero, A., Dobscha, S., Freund, J., Kilbourne, W. E., Luchs, M. G., Ozanne, L. K., & Thøghersen, J. (2011). Sustainable consumption: Opportunities for consumer research and public policy. *Journal of Public Policy & Marketing*, 30(1), 31-38. doi: 10.1509/jppm.30.1.31
- Rettie, R., Burchell, K., & Riley, D. (2012). Normalising green behaviours: A new approach to sustainability marketing. *Journal of Marketing Management*, 28(3/4), 420-444. doi: 10.1080/0267257X.2012.658840
- Richins, M. L. (2004). The Material Values Scale: Measurement Properties and Development of a Short Form. *Journal of consumer Research*, 31(1), 209-219. doi: 10.1086/383436
- Richins, M. L., & Dawson, S. (1992). A consumer values orientation for materialism and its measurement: scale development and validation. *Journal of consumer Research*, 19(3), 303-316. doi: 10.1086/209304

- Rindfleisch, A., Burroughs, J. E., & Wong, N. Y. (2009). The Safety of Objects: Materialism, Existential Insecurity, and Brand Connection. *Journal of consumer Research*, 36(1), 1-16. doi: 10.1086/595718
- Roberts, J. A. (1996). Green consumer in the 1990s: profile and implications for advertising. *Journal of Business Research*, 36(3), 217-231. doi: 10.1016/0148-2963(95)00150-6
- Schaefer, A., & Crane, A. (2005). Addressing Sustainability and Consumption. *Journal of Macromarketing*, 25(1), 76-92. doi: 10.1177/0276146705274987
- Sharma, P. (2011). Country of origin effects in developed and emerging markets: Exploring the contrasting roles of materialism and value consciousness. *Journal of International Business Studies*, 42(2), 285-306. doi: 10.1057/jibs.2010.16
- Shrum, L. J., Lowrey, T. M., Pandelaere, M., Ruvio, A. A., Gentina, E., Furchheim, P., . . . Steinfield, L. (2014). Materialism: the good, the bad, and the ugly. *Journal of Marketing Management*, 1-24. doi: 10.1080/0267257x.2014.959985
- Soron, D. (2010). Sustainability, self-identity and the sociology of consumption. *Sustainable Development*, 18(3), 172-181. doi: 10.1002/sd.457
- Sparks, P., & Shepherd, R. (1992). Self-identity and the theory of planned behaviour: assessing the role of identification with green consumerism. *Social Psychology Quarterly*, 55(4), 388-399. doi: 10.2307/2786955
- Staedter, T. (2013). 7 of 10 Most Air-Polluted Cities Are in China. Retrieved from <http://news.discovery.com/earth/weather-extreme-events/7-of-10-most-air-polluted-cities-china-130116.htm>
- Steenkamp, J.-B. E. M., & Baumgartner, H. (1998). Assessing Measurement Invariance in Cross-National Consumer Research. *Journal of Consumer Research*, 25(1), 78-90.
- Steg, L., Bolderdijk, J. W., Keizer, K., & Perlaviciute, G. (2014). An integrated framework for encouraging pro-environmental behaviour: The role of values, situational factors and goals. *Journal of Environmental Psychology*, 38, 104-115. doi: 10.1016/j.jenvp.2014.01.002
- Strizhakova, Y., & Coulter, R. A. (2013). The "green" side of materialism in emerging BRIC and developed markets: the moderating role of global cultural identity. *International Journal of Research in Marketing*, 30(1), 69-82. doi: 10.1016/j.ijresmar.2012.08.003
- Sudbury Riley, L., Kohlbacher, F., & Hofmeister, A. (2012). A cross-cultural analysis of pro-environmental consumer behaviour among seniors. *Journal of Marketing Management*, 28(3-4), 290-312. doi: 10.1080/0267257x.2012.658841

- Thøgersen, J. (2000). Knowledge barriers to sustainable consumption. In P. F. Bone (Ed.), *Marketing and Public Policy Conference Proceedings 2000*. Chicago: AMA.
- Thøgersen, J., & Zhou, Y. (2012). Chinese consumers' adoption of a 'green' innovation – The case of organic food. *Journal of Marketing Management*, 28(3-4), 313-333. doi: 10.1080/0267257X.2012.658834
- Thorbjørnsen, H., Pedersen, P. E., & Nysveen, H. (2007). This is Who I am: Identity Expressiveness and the Theory of Planned Behavior. *Psychology & Marketing*, 24(9), 763-785. doi: 10.1002/mar.20183
- Unanue, W. (2010). *Associations between a materialistic value orientation, environmental attitudes and behaviour, ecological identity, and personal well-being in the UK*. Masters thesis, University of Sussex, Brighton, UK.
- van der Werff, E., Steg, L., & Keizer, K. (2013a). It is a moral issue: the relationship between environmental self-identity, obligation-based intrinsic motivation and pro-environmental behaviour. *Global Environmental Change*, 23(5), 1258-1265. doi: 10.1016/j.gloenvcha.2013.07.018
- van der Werff, E., Steg, L., & Keizer, K. (2013b). The value of environmental self-identity: The relationship between biospheric values, environmental self-identity and environmental preferences, intentions and behaviour. *Journal of Environmental Psychology*, 34(June), 55-63. doi: 10.1016/j.jenvp.2012.12.006
- van der Werff, E., Steg, L., & Keizer, K. (2014). Follow the signal: When past pro-environmental actions signal who you are. *Journal of Environmental Psychology*, 40(December), 273-282. doi: 10.1016/j.jenvp.2014.07.004
- Vermeir, I., & Verbeke, W. (2008). Sustainable food consumption among young adults in Belgium: Theory of planned behaviour and the role of confidence and values. *Ecological Economics*, 64(3), 542-553. doi: 10.1016/j.ecolecon.2007.03.007
- Vlek, C., & Steg, L. (2007). Human Behaviour and Environmental Sustainability: Problems, Driving Forces and Research Topics. *Journal of Social Issues*, 63(1), 1-19. doi: 10.1111/j.1540-4560.2007.00493.x
- Wells, V. K., Ponting, C. A., & Peattie, K. (2011). Behaviour and climate change: consumer perceptions of responsibility. *Journal of Marketing Management*, 27(7-8), 808-833. doi: 10.1080/0267257X.2010.500136
- Whitmarsh, L. (2011). Scepticism and uncertainty about climate change: dimensions, determinants and change over time. *Global Environmental Change*, 21(2), 690-700. doi: 10.1016/j.gloenvcha.2011.01.016

- Whitmarsh, L., & O'Neill, S. (2010). Green identity, green living? The role of pro-environmental self-identity in determining consistency across diverse pro-environmental behaviours. *Journal of Environmental Psychology, 30*(3), 305-314. doi: 10.1016/j.jenvp.2010.01.003
- Williams, J., & MacKinnon, D. P. (2008). Resampling and distribution of the product methods for testing indirect effects in complex models. *Structural Equation Modeling, 15*(1), 23-51. doi: 10.1080/10705510701758166
- Woodside, A. G. (2013). Moving beyond multiple regression analysis to algorithms: Calling for adoption of a paradigm shift from symmetric to asymmetric thinking in data analysis and crafting theory. *Journal of Business Research, 66*(4), 463-472. doi: 10.1016/j.jbusres.2012.12.021
- World Wildlife Fund (WWF). (2008). Living Planet Report 2008. In C. Hails (Ed.). Gland: WWF International.
- Xiao, C., Dunlap, R. E., & Hong, D. (2013). The nature and bases of environmental concern among Chinese citizens. *Social Science Quarterly, 94*(3), 672-690. doi: 10.1111/j.1540-6237.2012.00934.x
- Yale Center for Environmental Law & Policy. (2014). 2014 Environmental Performance Index: Full Report and Analysis. Retrieved from http://epi.yale.edu/files/2014_epi_report.pdf
- Zavestoski, S. (2002). The social-psychological bases of anticonsumption attitudes. *Psychology & Marketing, 19*(2), 149-165. doi: 10.1002/mar.10007

Appendix 1: Demographic profile of respondents by country

Variables		Percentage			
		UK (n=1,037)	UK Population ¹	China ⁵ (n=1,025)	
Gender	Male	48.7	48.5	51.5	
	Female	51.3	51.5	48.5	
Age	18-24	11.9	8.94 ²	16.6	
	25-34	16.3	17.5	27.5	
	35-44	17.9	18.3	25.8	
	45-54	17.6	18.2	18.2	
	55-64	15.8	14.4	9.9	
	65+	20.5	21.6	2.0	
Occupation	FT/PT employment	53.5	60.1	79.3	
	Student	6.3	2.4	8.6	
	Homemaker	7.0	4.1	1.0	
	Unemployed	6.6	4.1	2.0	
	Retired	24.4	22.8	7.9	
	Other	2.2	6.5	1.3	
Income³	Up to £14,000	29.7	n/a	Up to £1,710.05	8.8
	£14,000-27,999	31.3	n/a	£1,711.19-3,421.24	9.7
	£28,000-41,999	16.9	n/a	£3,422.38-6,843.62	27.0
	£42,000-55,999	6.3	n/a	£6,844.76-11,406.79	22.7
	£56,000+	4.8	n/a	£11,407.93+	29.8
	Prefer not to say	11.0	n/a	Prefer not to say	
Highest qualification	Lower secondary education (GCSEs, professional qualifications & equivalent)	37.0	36.4	Middle school	1.5
	Upper secondary education (A levels & equivalent)	31.1	31.9	High school & College Diploma	28.7
	1 st stage tertiary education (University UG & Taught Masters)	31.1	31.1	University Bachelor & Masters Degree	68.7
	2 nd stage tertiary education (Doctorate Degree)	9.0	6.7	Doctorate Degree	1.2
Dependent children	Yes	26.9	42.1 ⁴	67.3	
	No	73.1	57.9	32.7	

¹ UK Population data was only available for gender and age, comparisons are based on UK Census Data 2011, Based on population (20 years and over) n=48,085,000

²Based on 20-24 year olds due to different classification in UK census

³Note: UK census data not available for Income, Income for China was measured on Chinese currency (CNY) monthly. Exchange rate CNY100=£10.519

⁴UK census figures based on all usual residents in household 62,055,838

⁵ Comparison to the Chinese population was not possible due to limited census data available.

Appendix 2: Measurement Scales

Constructs	Statements	Mean UK (SD)	Mean PRC (SD)
MAT	I admire people who own expensive homes, cars and clothes.	2.42 (1.15)	3.47 (1.06)
	My life would be better if I owned certain things I do not have.	2.93 (1.08)	3.77 (.86)
	The things I own say a lot about how well I am doing in life.	2.84 (1.00)	3.72 (.87)
	I like a lot of luxury in my life.	2.73 (1.03)	3.11 (1.17)
	I would be happier if I could afford to buy more things.	3.10 (1.09)	3.69 (.88)
	Buying things gives me a lot of pleasure. ³	3.68 (.86)	4.07 (.80)
SCM ¹	Before purchasing a product, it is important to know what others think of different brands or products.	2.43 (1.12)	3.77 (.85)
	Before purchasing a product, it is important to know what kinds of people buy certain brands or products.	2.15 (1.03)	3.58 (.97)
	Before purchasing a product, it is important to know what others think of people who buy certain brands or products.	2.15 (1.03)	3.66 (.85)
	Before purchasing a product, it is important to know what brands or products to buy to make good impressions on others.	2.05 (1.00)	3.60 (.93)
PESI ¹	I think of myself as an environmentally-friendly consumer.	3.46 (.90)	3.99 (.74)
	Each consumer's behaviour can have a positive effect on society by purchasing products sold by socially responsible companies.	3.71 (.80)	4.07 (.70)
	I think of myself as someone who is very concerned with environmental issues.	3.20 (1.01)	3.94 (.79)
	I would be embarrassed to be seen as having an environmentally-friendly lifestyle. ^{®3}	4.04 (.87)	3.71 (1.10)
	I would not want my family or friends to think of me as someone who is concerned about environmental issues. ^{®3}	3.99 (.91)	3.66 (1.09)
EC ¹	Environmental problems are not affecting my life personally. [®]	3.02 (1.01)	3.61 (1.09)
	Environmental problems are exaggerated, because in the long run things balance out. [®]	3.40 (1.04)	3.65 (1.12)
	I can think of many things I'd rather do than work toward improving the environment. [®]	3.24 (.92)	3.76 (1.06)
	I have too many obligations to take an active part in an environmental organisation. ^{® 3}	3.09 (.96)	2.72 (.89)
SCB ²	Buy fair-trade groceries	2.52 (1.03)	3.51 (.98)
	Buy food which is organic	2.15 (.90)	3.26 (1.05)
	Buy environmentally-friendly products	2.54 (.93)	3.41 (.96)
	Buy food which is locally grown or in season	2.88 (.99)	3.72 (.90)
	Buy products using reduced packaging	2.73 (1.02)	3.54 (.92)

¹ Scale: 1-5, ranging from 'strongly disagree' to 'strongly agree'; a higher means indicates higher agreement with the statement.

² Scale: 1-5 ranging from 'never, occasionally, often, nearly-always and always'; a higher score is indicative of a greater level of pro-environmental behaviour.

³ Item deleted due to low factor loading

^R Reverse coded (Note: means have been adjusted, a higher mean indicated higher disagreement with the statement)