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# Values, identity and pro-environmental behaviour

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The importance of understanding and promoting pro-environmental behaviour among individual consumers in modern Western Societies is generally accepted. Attitudes and attitude change are often examined to help reach this goal. But although attitudes are relatively good predictors of behaviour and are relatively easy to change they only help explain specific behaviours. More stable individual factors such as values and identities may affect a wider range of behaviours. In particular factors which are important to the self are likely to influence behaviour across contexts and situations. This paper examines the role of values and identities in explaining individual pro-environmental behaviours. Secondary analyses were conducted on data from three studies on UK residents, with a total of 2694 participants. Values and identities were good predictors of pro-environmental behaviour in each study and identities explain pro-environmental behaviours over and above specific attitudes. The link between values and behaviours was fully mediated by identities in two studies and partially mediated in one study supporting the idea that identities may be broader concepts which incorporate values. The findings lend support for the concept of identity campaigning to promote sustainable behaviour. Moreover, it suggests fruitful future research directions which should explore the development and maintenance of identities.

## Introduction

Modern societies place a high value on economic prosperity. Individuals who live in these societies are continuously exposed to cultural values which promote the acquisition of wealth and material possessions. But there is increasing concern about the environmental damage engendered by current levels of consumerism (Jackson, 2009). It is therefore vital to promote pro-environmental behaviour and reduce consumption. Within the area of psychology a significant amount of research has been

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conducted to understand the variables that affect pro-environmental behaviours. Much of this research focuses on the Theory of Planned Behaviour (TPB; Ajzen & Fishbein, 1974) and the Norm Activation Model (NAM; Schwartz, 1977). It is worth noting that these models aim to explain intentional or planned behaviour and may not be suitable for explaining habitual behaviour (Steg & Vlek, 2009). The TPB suggests that pro-environmental behaviour is more likely to occur when people have a positive attitude towards such behaviour, believe significant others already do it (perceived descriptive social norm) or believe it should be done (perceived injunctive social norm) and when they feel they can adopt the behaviour (perceived behaviour control). The NAM suggests that altruistic behaviour (and therefore also pro-environmental behaviour according to some) is more likely when people feel a sense of moral obligation to adopt such behaviour. Moral obligation is a function of awareness of the consequences of the behaviour for others and a sense of personal responsibility. There is now plenty of support for these models (for overviews see Bamberg & Möser, 2007; Steg & Vlek, 2009). Moreover, it has been shown that the variables in these models are affected by general and pro-environmental values (e.g. Schultz & Zelezny, 1999; Oreg & Katz-Gero, 2006; Groot & Steg, 2007) and environmental identities (Stern & Dietz, 1994; Nigbur *et al.*, 2010; Whitmarsh & O'Neill, 2010). Values and identities, however, are rarely studied together and we therefore know little about their relationship and relative impact on behaviour.

Many behaviour change interventions focus on attitudes. A person's attitude towards pro-environmental behaviour can be a good predictor of such behaviour (see Staats, 2003). Attitudes are relatively easy to change and can alter with new information or circumstances (Ajzen, 2005). But attitudes tend to be measured with respect to a specific target object or event and are therefore relatively narrow. An attitude towards one behaviour may not necessarily be related to another behaviour. For instance, people who have a positive attitude towards recycling are more likely to recycle, but this does not mean they also cycle to work or use ecological washing powder. Similarly pro-environmental behaviour in one domain does not necessarily correlate strongly with pro-environmental behaviour in another (e.g. Karp, 1996; Corraliza & Berenguer, 2000; Milfont *et al.*, 2006; Oreg & Katz-Gerro, 2006; Dolnicar & Grun, 2009) and engagement in one pro-environmental behaviour does not necessarily spillover to another (Thøgersen & Ölander, 2003). Yet there is also evidence of some consistency in individuals' behaviour (Thøgersen, 2004). Thøgersen (2004) suggests that spillover can occur, but it is more likely in behaviours that are conceptually similar (e.g. recycling glass or paper) than in behaviours which are very dissimilar (e.g. recycling glass and cycling to work). Indeed some go as far as to suggest that pro-environmental behaviour can in fact be perceived as a uni-dimensional rather than a multi-dimensional concept because such behaviours are linked through a common goal—protecting the environment (e.g. Kaiser & Wilson, 2004).

It seems valuable to examine the relative importance people attach to more general goals such as protecting the environment if this helps understand pro-environmental behaviour across different contexts. There is evidence to suggest that people who behave more pro-environmentally across contexts rate particular values highly

(Thøgersen & Ölander, 2003) and that pro-environmental behaviours are influenced by such values (Schwartz & Bilsky, 1990; Lindenberg & Steg, 2007). Another stable concept that has been studied in this context is that of self-identity. Again there is evidence to suggest that different consumer behaviours are related to the extent to which people perceive themselves as a typical person who would adopt such a behaviour (e.g. Sparks & Shepherd, 1992; Whitmarsh & O'Neill, 2010). Although the relative importance or salience of identities are to an extent context dependent (e.g. at work, being a researcher is more important to me than being a mother), values and identities are generally stable factors that transcend specific situations. The extent to which you see yourself as an environmentally friendly person, for instance, is likely to be related to a wide range of pro-environmental behaviours including waste, transport and buying behaviours. These factors may operate to guide behaviours in multiple situations and thus offer broader ranging insights into determinants of 'green' behaviour. Indeed, some have argued that understanding and leveraging more fundamental aspects of the person such as values and identity is critical in moving towards sustainable behaviours ([www.identitycampaigning.org](http://www.identitycampaigning.org)). Unless these deeper constructs are engaged, any change towards pro-environmental behaviour will be piecemeal, slow and disjointed, with each behaviour adopted or rejected separately by individuals, with the risk of 'rebound' ('greener' behaviour in one domain leading to less sustainable behaviour in another) undermining any gains (Crompton & Kasser, 2010; Druckman *et al.*, 2011).

There is significant evidence that values and identities play a role in explaining and predicting pro-environmental behaviour. However, very few studies have looked at values and identities simultaneously and we know little, therefore, about the relative importance of each of these constructs in understanding pro-environmental behaviour.

### *Self-identity*

Self-identity refers to how an individual sees him/herself, and can encompass all aspects of the self such as physical attributes, preferences, values, personal goals, habitual behaviour, personality traits and personal narratives (Pillsbury, 1934; McAdams, 1995). Individuals tend to present themselves in ways that are congruent with their self-identity (Burke & Reitzes, 1991), and this extends to behaviour (Callero, 1985; Sparks & Shepherd, 1992) including consumption (Oyserman *et al.*, 2007; Dittmar, 2010). Although identity represents an individual's subjective perspective on the self, identities are formed through social interaction. Theorists in the symbolic interactionist tradition proposed the development of the self through reflection from others in social exchanges (Mead, 1934; Breakwell, 1986) and Stets and Burke (2000) proposed that identities develop through processes of self-categorisation and identification. People thus develop multiple identities e.g. I am a woman, I am a researcher, I am an environmentalist. Multiple identities are proposed as being managed in a 'hierarchy of salience' (Stryker, 1984): identities vary in salience, and particular identities, such as gender, are likely to be chronically salient.

Identities can form barriers to pro-environmental behaviours. For instance, Stradling *et al.* (1999) found that car drivers are less willing to reduce their car use when they derive a sense of personal identity from driving. Identities can also motivate 'green' behaviour. An environmental identity reflects the extent to which people indicate that environmentalism is a central part of who they are, and a number of studies have shown that an environmental identity increases engagement in pro-environmental actions. For example, Whitmarsh and O'Neill (2010) found that people with a 'green' identity more often act pro-environmentally. Similarly, Van der Werff *et al.* (2011) found that an energy saving identity is positively related to intentions to conserve energy.

Exploring how the influence of identities on behaviour may be theoretically modelled, several studies have considered identities in conjunction with the TPB (Ajzen & Fishbein, 1974). TPB proposed that intention to perform a behaviour is predicted by three factors: attitudes (is it a good or bad thing to do?), subjective norms (what do others think I should do?) and perceived behavioural control (can I do it?). Empirical results have demonstrated that, over and above these variables, identity can explain behaviours including consumer behaviour (purchasing fashionable watches, trendy backpacks and mobile phones; Manetti *et al.*, 2002), 'green' consumption (Sparks & Shepherd, 1992) and recycling (Nigbur *et al.*, 2010). The conclusion from these studies was that the TPB should be extended to include identity as a predictor of behaviour.

### *Values*

Values may be defined as 'concepts or beliefs, [about] desirable end states or behaviours, [which] transcend specific situations, [and] guide selection or evaluation of behaviour and events, and are ordered by relative importance' (Schwartz & Bilsky, 1990, p. 878). Schwartz (1990, 1992) developed a Values Inventory, comprising 56 'guiding principles in life' and his work has been validated in many transnational studies. This research suggests that human values can be grouped into 10 motivational domains and two dimensions (self-enhancement versus self-transcendence and openness to change versus conservatism). Using Schwartz's inventory, Stern (2000) and colleagues have suggested that three values underlie environmental concern: egoism, altruism and biospherism. De Groot and Steg (2007, 2008) further developed this idea, creating and evaluating among a wide range of samples, a short rating scale which measures these three value orientations.

There are many other measures of environmental values (see Dietz *et al.*, 2005 for an overview). The New Ecological Paradigm (NEP) is the most commonly used (Dunlap *et al.*, 2000). It measures the extent to which people have an anthropocentric versus an ecocentric worldview. NEP has been shown to relate negatively to egoism, and positively to biospherism (De Groot & Steg, 2008) and to self-transcendence (Schultz & Zelezny, 1999). Stern and colleagues posited that general values affect more specific values (NEP). NEP affects awareness of consequences (of environmentally damaging behaviours) and subsequently awareness of responsibility to reduce

these consequences. This will then result into a sense of obligation to reduce the threat and therefore affect pro-environmental behaviour. Several studies have supported (parts of this) model (e.g. Schultz & Zelezny, 1999; De Groot & Steg, 2007, 2008).

A final value concept that may be relevant when studying pro-environmental consumer behaviours is materialism. Richins (2004) developed a materialistic values scale (MVS) to measure 'the importance people ascribed to the ownership and acquisition of material goods in achieving major life goals or desired states' (p. 210). Negative correlations tend to be found between materialism and environmental values (Banerjee & McKeage, 1994; Clump *et al.*, 2002; Brown & Kasser, 2005; Hirsh & Dolderman 2007; Kilbourne & Pickett, 2008; Gatersleben *et al.*, 2010). The reason why these values may be negatively related is often explained on the basis of Schwartz's work on general values (e.g. Schwartz & Bilsky, 1990). Materialism is positively related to self-enhancement (Richins, 2004; Kilbourne *et al.*, 2005) and egoism (Gatersleben *et al.*, 2010) whereas environmental values are positively related to self-transcendence (Stern & Dietz, 1994; Schultz & Zelezny, 1999).

### *Values, identity and behaviour*

Only recent work has started to examine the role of both values and identity (e.g. Snelgar, 2003; Whitmarsh & O'Neill, 2010; Van der Werff *et al.*, 2011). We know little about the link between values and identity, although values have been seen as an integral part of identity. MacAdams (1995) conceptualised identity as an integrated life story: 'what person the person is trying to make' (p. 306). Within this narrative, values are drawn upon to explain behaviour and to characterise the self. Hitlin (2003) proposed that values form a cohesive core of personal and social identities, arguing that a values-based conception of personal identity influences the formation of a role or social identity. He showed that relevant values along the self-enhancement/self-transcendence dimension are significant predictors of the volunteer identity, controlling for previous measures of the identity.

Values are generally perceived as fairly distal determinants of behaviour which influence behaviour via more proximal determinants, such as beliefs, specific attitudes and norms (e.g. Eagly & Chaiken, 1993; Stern *et al.*, 1995). Identities, however, are broader concepts encompassing many aspects of the self, including psychological processes (including behaviours) which people may adopt for maintaining and protecting the self (Breakwell, 1986). For instance, if being environmentally friendly is an important part of who you are, recycling, voting for the green party and buying ecological products may all be important things to do in order to express, maintain and protect that identity.

We propose then that values are components, even central components, of identity. Identity is the theoretically broader construct, encompassing many other aspects of the self, such as self-image, social roles (Stryker, 1984) and psychological processes for maintaining and protecting the self (Breakwell, 1986). It can be suggested that identity may mediate the relationship between values and behaviours because values are part of one's identity: if you describe yourself as an environmentally friendly

person you are likely to hold strong environmental values and behave pro-environmentally.

The current research aims to explore in more detail the relationship between values, identity and pro-environmental behaviours. The relationship between identity and two major theories of planned behaviour (TPB, Ajzen & Fishbein (1974) and NAM, Schwartz (1977)) are also investigated. Secondary analyses were conducted on three different data sets from studies among UK residents. In each of these studies, questions were included on pro-environmental behaviour, and on identity, values or both. In the analysis below, the first study examines the extent to which identity may mediate the relationship between materialistic values (MVS, Richins, 2004) and environmental values (NEP, Dunlap *et al.*, 2000) on the one hand and intentions to buy fair trade produce on the other. The second study examines the extent to which identity mediates the link between biospheric, altruistic and egoistic values (De Groot & Steg, 2007, 2008) and self-reported pro-environmental behaviour. The final study examines whether identity explains variance in intentions to adopt a range of pro-environmental behaviours, alongside variables from TPB (Ajzen & Fishbein, 1974) and NAM (Schwartz, 1977).

### **Study 1: values, identity and ecological purchases**

A survey study was conducted among English households in 2001 to examine community engagement and attitudes and perceptions in relation to sustainable lifestyles. The survey was distributed in two areas in England, one urban and one rural area. Respondents could win a £70 voucher (just over 100 Euro or US dollar in 2001) if they returned the completed questionnaire in the freepost envelope provided. A total of 2000 surveys were sent out and 266 were returned (a 13% response rate). Just over half the respondents came from the rural area (54%) and about two-thirds were female (64%). About a third of the respondents were between 16 and 45 years old, another third was between 45 and 65 years old and the remainder were 65 or older. The average annual income of the respondents ranged from less than £10,000 to more than £100,000, with an average of around £35,000 (above the national average of around £28,500 in 2001 (ONS statistics; www.ons.gov.uk; approximately €54,000, \$52,000 in 2001).

*Materialism* was measured with the MVS developed by Richins (2004). Scores can range from 1 to 5; the mean score was calculated for each respondent across the 15 items of this scale. The scale had a high internal consistency ( $\alpha = 0.80$ ). Materialism was generally low ( $M = 2.47$ ,  $SD = 0.51$ ). It was not related to age, gender or income.

*Environmental values* were measured with the NEP (Dunlap *et al.*, 2000). Scores on the NEP were relatively high ( $\alpha = 0.78$ ;  $M = 3.69$ ,  $SD = 0.52$ ; 1 = low, 5 = high). The NEP was not related to age, gender or income but was negatively related to materialism ( $r = -0.19$ ,  $p = 0.03$ ).

*Pro-environmental behaviour* was measured by asking respondents how often they buy Fair Trade food products and organic food products. These two items were

combined into one variable by calculating their mean score ( $M = 2.71$ ,  $SD = 0.96$ ). Buying behaviour was positively related to income ( $r = 0.29$ ,  $p < 0.001$ ) but not to age or gender.

*Identity* participants were asked to what extent they considered themselves to be different consumer types (e.g. health conscious or frugal). Factor analyses revealed three factors explaining 54% of the variance in total. The first factor (explaining 20% of the variance) captured the extent to which respondents perceived themselves to be 'hedonist consumers' (fashion conscious, reckless, self-indulgent, compulsive and not cautious). The second factor (explaining 20% of the variance) captured the extent to which respondents perceived themselves to be 'conscious consumers' (health conscious, green, fitness conscious, ethical). The third factor grouped the remaining two items (eco-centric and a non-consumer). On the basis of the first two factors, two new variables were created by calculating the means over items which had factor loadings of 0.50 or above on the relevant factor in the rotated factor solution: 'hedonist consumer' ( $\alpha = 0.66$ ;  $M = 2.27$ ,  $SD = 0.61$ ) and 'conscious consumer' ( $\alpha = 0.66$ ;  $M = 3.51$ ,  $SD = 0.63$ ). The extent to which respondents identified as a conscious consumer was not related to age and gender. Females were more likely to identify with a hedonist consumer identity ( $M = 2.35$ ,  $SD = 0.60$ ) than male respondents ( $M = 2.13$ ,  $SD = 0.60$ ;  $t = 2.80$  (259),  $p = 0.006$ ). Moreover, income was positively related to identifying with a conscious consumer identity ( $r = 0.17$ ,  $p = 0.007$ ) as well as a hedonist consumer identity ( $r = 0.17$ ,  $p = 0.008$ ).

## Results

Simple correlations were computed to examine the link between identities and values. Materialistic values (MVS), but not the NEP, were positively related to a hedonist consumer identity ( $r = 0.28$ ,  $p < 0.001$ ). The extent to which respondents saw themselves as conscious consumers was positively related to NEP ( $r = 0.16$ ,  $p = 0.10$ ) but not to MVS.

Regression analyses were conducted to examine whether values are related to pro-environmental behaviours. The NEP was positively related to pro-environmental behaviour and materialism was not significantly related (Step 1, Table 1). When identities were included in the regression (Step 2), significantly more variance was explained ( $\Delta R^2 = 0.20$ ,  $F(2, 254) = 34.90$ ,  $p < 0.001$ ). Both hedonist and conscious consumer identities were related to pro-environmental behaviour. When identities were included, the relationship between environmental values and behaviours was weaker, suggesting that identities mediate the link between values and behaviours. To test this a Sobel mediation test was conducted (Baron & Kenny, 1986). The Sobel test for the conscious consumer identity was significant ( $z = 2.28$ ,  $p = 0.01$ ), showing that this identity mediated the relationship between NEP and pro-environmental behaviour. Mediation was partial with a small significant relationship remaining when identity was included.

Table 1. Regression of pro-environmental behaviour onto MVS, NEP and identities

|              | Step 1                                      |                |         | Step 2                                       |                |         |
|--------------|---|----------------|---------|--|----------------|---------|
|              | $\Delta R^2 = 0.04; F(2, 257) = 6.94^{***}$ |                |         | $\Delta R^2 = 0.24; F(4, 254) = 21.59^{***}$ |                |         |
|              | <i>B</i>                                    | Error <i>B</i> | $\beta$ | <i>B</i>                                     | Error <i>B</i> | $\beta$ |
| (Constant)   | 3.53  | 0.57           |         | 5.74   | 0.57           |         |
| MVS          | -0.17                                       | 0.12           | -0.09   | -0.23  | 0.11           | -0.12*  |
| NEP          | 0.34  | 0.12           | 0.18**  | 0.21   | 0.10           | 0.12*   |
| ID hedonist  |   |                |         | 0.26   | 0.09           | 0.17**  |
| ID conscious |   |                |         | 0.63   | 0.08           | 0.42*** |

Note: Multicollinearity between identities was not detected. \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

### Study 2: identity, values and the New Environmental Paradigm

A survey was sent to a random sample of households in two areas in the UK, one city in the North and one town in the South. The study examined the role of values and identity in explaining different pro-environmental behaviour. One thousand questionnaires were sent out in 2009, and 135 were returned (a response rate of 13.5%), of which 36% were from the North. Just under half of the respondents were female (47%). About a third of the respondents were under 50, another third were between 50 and 70 years of age and another third were over 70. Two-thirds earned over £25,000 with a third of the sample earning more than £50,000 per annum (Average household income in 2009 approximately £36,000 (ONS statistics; www.ons.gov.uk); approximately €36,000, \$52,000 in 2009).

*Identity*: three questions were asked for four different consumer identities (health conscious, environmentally friendly, moral and frugal). These items included questions such as 'Being ... is an important part of who I am' (1 = strongly agree, 5 = strongly disagree). The questions were based on previous research (e.g. Sparks & Shepherd, 1992; Hinds & Sparks, 2008) and a qualitative study (Evans & Abrahamse, 2010). For each identity, a scale was computed across the three relevant items. The health ( $M = 4.03$ ,  $SD = 0.68$ ) and environmental identity ( $M = 3.50$ ,  $SD = 0.85$ ) scale showed very good reliability (Cronbach  $\alpha > 0.80$ ), the moral identity scale showed good reliability ( $\alpha = 0.70$ ;  $M = 3.78$ ,  $SD = 0.66$ ) but the frugal identity scale showed very poor reliability (0.25) which could be improved significantly ( $\alpha = 0.84$ ;  $M = 3.96$ ,  $SD = 0.82$ ) upon removal of one item ('As a person it is important to me that I attempt not to be wasteful'). This may be because of the wording of the question, which includes a double negative. Such questions are more difficult to answer and this may have resulted in increased random error in responses.

A higher income was negatively related to environmental ( $r = -0.29$ ,  $p = 0.01$ ), moral ( $r = -0.35$ ,  $p < 0.001$ ) and frugal identities ( $r = -0.27$ ,  $p = 0.003$ ). Older people in the sample were more frugal ( $r = 0.20$ ,  $p = 0.02$ ). Women were more likely to identify with an environmental consumer identity ( $M = 3.71$ ,  $SD = 0.77$ ) than men ( $M = 3.32$ ,  $SD = 0.88$ ;  $t = 2.69$  (131),  $p = 0.008$ ). They were also more

likely to identify with a moral consumer identity ( $M = 3.92$ ,  $SD = 0.59$ ) than men did ( $M = 3.66$ ,  $SD = 0.70$ ;  $t = 2.24$  (131),  $p = 0.027$ ).

*Values*: values were measured using the values scale developed by De Groot and Steg (2008). Respondents were asked to indicate how important 13 different values were as a guiding principle in their lives ( $-1$  'goes against my principles',  $0$  'not important' to  $7$  'extremely important'). Cronbach alpha for the 5 egoistic values (authority, wealth, power, being influential, being ambitious) was  $0.71$  ( $M = 2.55$ ,  $SD = 1.31$ ); for the 4 altruistic values (social justice, equality, peace, being helpful) was  $0.75$  ( $M = 5.25$ ,  $SD = 1.20$ ); and for the 4 biospheric values (preventing pollution, protecting the environment, respecting the earth, unity with nature), the alpha coefficient was  $0.89$  ( $M = 5.07$ ,  $SD = 1.44$ ). Values were not related to age, gender or income.

*New Environmental Paradigm*: as in Study 1, respondents were asked to complete the NEP (Dunlap et al., 2000). Scores on this scale were high ( $\alpha = 0.81$ ;  $M = 3.51$ ,  $SD = 0.51$ ;  $1 =$  low,  $5 =$  high). NEP scores were not related to age, gender or income.

*Pro-environmental behaviour*: respondents indicated how often they adopted 20 pro-environmental behaviours, on a 5-point scale ( $1 =$  never,  $5 =$  always). These included energy behaviours (e.g. lowering thermostat) as well as recycling, food and transport behaviours. One scale was computed on the basis of these questions and showed good reliability ( $\alpha = 0.83$ ;  $M = 3.44$ ,  $SD = 0.50$ ). Those with a higher income were less likely to adopt pro-environmental behaviours ( $r = -0.23$ ,  $p = 0.008$ ). Women were more likely to adopt pro-environmental behaviours ( $M = 3.66$ ,  $SD = 0.42$ ) than men ( $M = 3.25$ ,  $SD = 0.48$ ;  $t = 5.24$  (133),  $p < 0.001$ ).

## Results

Simple correlations explored the relationship between values and identities. Moderate to strong relationships were found (see Table 2). Both biospheric values and NEP were strongly related to environmental identity, as well as to moral and frugal identities. This suggests there may be overlap between the value and identity concepts, especially where they share related goals, such as environmental conservation or morality. Interestingly, and perhaps surprising, egoistic values were also positively related

Table 2. Correlations between values and identities

|        |            | Identity |             |         |         |
|--------|------------|----------|-------------|---------|---------|
|        |            | Health   | Environment | Moral   | Frugal  |
| Values | Biospheric | 0.37***  | 0.68***     | 0.52*** | 0.42*** |
|        | Egoistic   | 0.32***  | 0.20*       | 0.30**  | 0.10    |
|        | Altruistic | 0.34***  | 0.46***     | 0.57*** | 0.38*** |
|        | NEP        | 0.09     | 0.48***     | 0.27**  | 0.27**  |

Note: \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$ .

to health, environmental and moral identities. A positive correlation was found between egoistic and altruistic values ( $r = 0.25$ ,  $p = 0.004$ ). The correlation between egoistic and biospheric values was not significant ( $r = 0.13$ , *ns*). This is not in line with the literature which suggests that these values should be inversely related. It is most likely a response artefact where some people were simply more likely to agree with all questions on the scale. Expected correlations, however, were significantly higher than these unexpected correlations and supported our hypotheses.

Regression analyses were conducted to investigate relative contributions to variance in pro-environmental behaviours. A step-wise regression was carried out, with values included in the first step, and four identities added to the equation in the second step. Table 3 presents the results. In Step 1, a biospheric value was the only significant predictor. Step 2, which includes identities, explained significantly more variance (18%;  $\Delta R^2 = 0.18$ ,  $F(4, 121) = 10.38$ ,  $p < 0.001$ ). Two identities contributed significant variance—environmental and frugal identities—and biospheric values become non-significant. Sobel tests showed that biospheric values were fully mediated by environmental identity ( $B$  becomes non-significant;  $z = 4.65$ ,  $p < 0.001$ ) and partially mediated by frugal identity ( $p < 0.001$ ;  $z = 3.46$ ,  $p < 0.001$ ).

As in Study 1, NEP was significantly related to pro-environmental behaviour (see Table 4). Adding identities to this simple regression explained an additional 36% of the variance in reported behaviours ( $\Delta R^2 = 0.36$ ;  $F(4, 127) = 21.98$ ,  $p < 0.001$ ). Sobel tests showed that the link between NEP and pro-environmental behaviour was fully mediated by environmental identity ( $B = 0.06$ , error  $B = 0.07$ ,  $p = 0.411$ ;  $z = 5.03$ ,  $p < 0.001$ ) and partially mediated by frugal identity ( $B = 0.30$ , error  $B = 0.05$ ,  $p = 0.002$ ;  $z = 2.73$ ,  $p < 0.001$ ).

Table 3. Regression of pro-environmental behaviour onto values and identity

|                  | Step 1   |           |                     | Step 2   |           |                    |
|------------------|--|-----------|---------------------|--|-----------|--------------------|
|                  | $\Delta R^2 = 0.26$ ;<br>$F(3, 127) = 16.05^{***}$ |           |                     | $\Delta R^2 = 0.43$ ;<br>$F(7, 121) = 14.90^{***}$ |           |                    |
|                  | <i>B</i>   | <i>SE</i> | $\beta$             | <i>B</i>   | <i>SE</i> | $\beta$            |
| (Constant)       | 2.38   | 0.17      |                     | 1.61   | 0.24      |                    |
| Value Biospheric | 0.13   | 0.03      | 0.40 <sup>***</sup> | 0.03   | 0.04      | 0.09               |
| Value Egoistic   | 0.04   | 0.03      | 0.11                | 0.01   | 0.03      | 0.01               |
| Value Altruistic | 0.06   | 0.04      | 0.14                | 0.02   | 0.04      | 0.05               |
| IDhealth         |  |           |                     | 0.03   | 0.06      | 0.04               |
| IDenvironment    |  |           |                     | 0.21   | 0.07      | 0.35 <sup>**</sup> |
| IDmoral          |  |           |                     | 0.02   | 0.07      | 0.03               |
| IDfrugal         |  |           |                     | 0.17   | 0.05      | 0.28 <sup>**</sup> |

Note: Due to high correlations between independent variables, we checked for multicollinearity but found no violations of assumptions.

Table 4. Regression of pro-environmental behaviour onto NEP and identity

|               | Step 1   |           |                     | Step 2   |           |                    |
|---------------|--|-----------|---------------------|--|-----------|--------------------|
|               | $\Delta R^2 = 0.12$ ;<br>$F(1, 123) = 19.52^{***}$ |           |                     | $\Delta R^2 = 0.47$ ;<br>$F(5, 127) = 23.99^{***}$ |           |                    |
|               | <i>B</i>   | <i>SE</i> | $\beta$             | <i>B</i>   | <i>SE</i> | $\beta$            |
| (Constant)    | 2.21   | 0.28      |                     | 1.51   | 0.31      |                    |
| NEP           | 0.35   | 0.08      | 0.36 <sup>***</sup> | 0.06   | 0.07      | 0.06               |
| IDhealth      |  |           |                     | 0.00   | 0.06      | 0.01               |
| IDenvironment |  |           |                     | 0.27   | 0.06      | 0.45 <sup>**</sup> |
| IDmoral       |  |           |                     | 0.06   | 0.06      | 0.07               |
| IDfrugal      |  |           |                     | 0.15   | 0.05      | 0.25 <sup>**</sup> |

Note: Due to high correlations between independent variables, we checked for multicollinearity but found no violations of assumptions.

### Study 3: identity, attitudes, norms and perceived behavioural control

An on-line survey was developed in 2007 by a commercial marketing research company on behalf of a major media group in the UK. The survey link was advertised in a range of media owned by this group (television, radio and magazines). Potential participants were offered a chance to win a range of prizes for participating in the study. The survey consisted of nearly 600 questions, most of which focused on media use (commercial television, radio and magazines), with some final questions on pro-environmental behaviours and identity.

A total number of 2293 people participated in the survey. The majority lived in England (76%), around 5% each lived in Wales, other European countries or the USA. Around a third of the respondents were between 40 and 80 years of age, a third was between 28 and 40 and another third was between 16 and 28 years old, making the sample relatively young. Just over half of the respondents (52%) were female. Over a quarter (28%) earned less than £25,000 and 17% earned more than £50,000 per annum (average household income in 2007 approximately £34,000 (ONS statistics; www.ons.gov.uk); approximately €50,000, \$66,000 in 2007).

*Pro-environmental attitudes and behaviours:* questions were asked about five behaviours: three with negative environmental impact (using a car for grocery shopping, using a car for travelling to work, using an aeroplane to go on holiday) and two with positive impact (buying Fair Trade coffee or tea and recycling household waste). All scales had 5 scale points. For each of these behaviours, respondents were asked one question on *intention* ('To what extent do you intend to... the next time you...'; 1 = definitely not, 5 = definitely), and one question on *perceived behavioural control* ('How easy is it for you to...'; 1 = very difficult, 5 = very easy). Both of these questions were phrased with respect to sustainable behaviours, for example, 'To what extent do you intend to avoid using your car the next time you travel to work?' One question for each behaviour was asked on *attitude* ('What is your attitude towards...'; 1 = Strongly disapprove, 5 = Strongly approve), one question on

(*injunctive*) *subjective norm* ('What is the attitude of your friends towards...'), 1 = Strongly disapprove, 5 = Strongly approve), and *personal norm* ('I feel guilty when I...'), 1 = Strongly disagree, 5 = Strongly agree). These three questions were phrased with respect to non-sustainable behaviours. Table 5 presents means and standard deviations. For clarity, the table depicts all variables with respect to sustainable behaviour, and reverses the scores on attitudes and subjective norms.

Only very weak relationships were found with age, gender or income. All significant correlations were low (one of 0.15, and the remainder below 0.10). Of note is that there appears to be a generally linear progression for all variables across the behaviours as shown in Table 5. That is, intention, attitude, perceived behavioural control, subjective and personal norms for buying Fair Trade products were stronger than for avoiding flying on holiday, which in turn was stronger than the avoidance of car use for shopping. Repeated measures analyses showed significant linear increases in intentions ( $F(1, 1654) = 3287.89, p < 0.001$ ), attitudes ( $F(1, 2257) = 3257.90, p < 0.001$ ), subjective norm ( $F(1, 1646) = 1434.66, p < 0.001$ ), personal norms ( $F(1, 1656) = 2170.97, p < 0.001$ ) and perceived behavioural control ( $F(1, 1505) = 3048.88, p < 0.001$ ) in the order in which the variables are presented in Table 5.

*Identity* was measured with four items asking respondents to what extent they agreed that they were a health conscious consumer ( $M = 3.57, SD = 0.87$ ), a price conscious consumer ( $M = 3.94, SD = 0.84$ ), an environmentally friendly consumer ( $M = 3.37, SD = 0.83$ ) and a frugal consumer ( $M = 3.22, SD = 0.86$ ; 5-point scale anchored at 1 = Strong disagree, 5 = Strong agree). These single item measures were analysed separately. Only very weak correlations were found between identities and demographic variables (all correlations were below 0.15, most below 0.10).

Table 5. Intentions, attitudes, perceived behavioural control, subjective and personal norms in relation to five sustainable behaviours

|                                  |           | Avoid car use<br>for major<br>grocery shop | Avoid car<br>use for<br>work | Not flying to<br>holiday<br>destination | Buying Fair<br>Trade coffee<br>and tea | Recycling |
|----------------------------------|-----------|--|------------------------------|---|--|-----------|
| Intention                        | <i>M</i>  | 1.93                                       | 2.38                         | 2.47                                    | 2.90                                   | 4.43      |
|                                  | <i>SD</i> | (1.21)                                     | (1.64)                       | (1.26)                                  | (1.10)                                 | (1.04)    |
| Attitude <sup>a</sup>            | <i>M</i>  | 2.53                                       | 2.83                         | 2.62                                    | 3.00                                   | 4.23      |
|                                  | <i>SD</i> | (0.86)                                     | (0.92)                       | (0.86)                                  | (0.76)                                 | (0.99)    |
| PBC                              | <i>M</i>  | 1.93                                       | 2.35                         | 2.65                                    | 3.72                                   | 4.07      |
|                                  | <i>SD</i> | (1.17)                                     | (1.54)                       | (1.23)                                  | (1.07)                                 | (1.19)    |
| Subjective<br>norms <sup>a</sup> | <i>M</i>  | 2.43                                       | 2.53                         | 2.45                                    | 2.95                                   | 3.63      |
|                                  | <i>SD</i> | (0.83)                                     | (0.84)                       | (0.80)                                  | (0.65)                                 | (0.98)    |
| Personal<br>norms                | <i>M</i>  | 2.18                                       | 2.38                         | 2.33                                    | 2.69                                   | 3.83      |
|                                  | <i>SD</i> | (1.01)                                     | (1.11)                       | (1.04)                                  | (1.05)                                 | (1.16)    |

<sup>a</sup>Score reversed.

### Results

Simple correlations suggested that there were small significant relationships between identities and attitude, perceived behavioural control, subjective norm and personal norms. The strongest links were found between identities and personal norms and in particular for an environmental identity (Table 6).

For each of the five behaviours, we conducted a stepwise regression (see Table 7): in the first step, intention towards pro-environmental behaviour was regressed onto TPB and NAM variables; in the second step, identities were added to the equation. For car use to work and for shopping, TPB and NAM variables appeared to be good predictors of intentions and identities did not explain additional variance. For reducing holiday flights, buying Fair Trade and recycling, however, we found a significant contribution of identities. In particular, environmental identity explained additional variance in each case for each of the behaviours over and above the TPB and NAM variables with 1% ( $\Delta R^2 = 0.005$ ,  $F(4, 1851) = 4.01$ ,  $p = 0.003$ ) added for not taking holiday flights, 3% for buying Fair Trade ( $\Delta R^2 = 0.028$ ,  $F(4, 1608) = 18.81$ ,  $p < 0.001$ ) and 1% for recycling ( $\Delta R^2 = 0.011$ ,  $F(4, 1862) = 10.46$ ,  $p < 0.001$ ).

Table 6. Correlations between identities and attitudes, perceived behavioural control, subjective and personal norms

|                               |                | Identities |         |               |         |
|-------------------------------|----------------|------------|---------|---------------|---------|
|                               |                | Health     | Price   | Environmental | Frugal  |
| Attitude                      | Car use shop   | -0.05*     | 0.03    | -0.10**       | -0.05*  |
|                               | Car use work   | -0.07**    | 0.01    | -0.13**       | -0.04*  |
|                               | Fly holiday    | -0.08**    | -0.04*  | -0.18**       | -0.09** |
|                               | Buy fair trade | -0.04*     | 0.00    | -0.11**       | -0.04*  |
|                               | Recycle        | -0.17**    | -0.06** | -0.28**       | -0.06** |
| Perceived behavioural control | Car use shop   | -0.01      | -0.08** | 0.00          | 0.00    |
|                               | Car use work   | 0.00       | 0.00    | 0.03          | -0.01   |
|                               | Fly holiday    | -0.03      | 0.02    | 0.05*         | 0.07**  |
|                               | Buy fair trade | 0.13**     | -0.03   | 0.12**        | 0.01    |
|                               | Recycle        | 0.10**     | 0.02    | 0.26**        | 0.03    |
| Subjective norms              | Car use shop   | -0.02      | 0.05*   | -0.03         | -0.02   |
|                               | Car use work   | -0.04      | 0.01    | -0.07**       | 0.01    |
|                               | Fly holiday    | -0.04      | -0.02   | -0.06**       | -0.05*  |
|                               | Buy fair trade | 0.01       | -0.02   | -0.02         | -0.04   |
|                               | Recycle        | -0.11**    | -0.05*  | -0.12**       | -0.06*  |
| Personal norms                | Car use shop   | 0.14**     | 0.00    | 0.21**        | 0.06**  |
|                               | Car use work   | 0.15**     | 0.04    | 0.22**        | 0.06*   |
|                               | Fly holiday    | 0.16**     | 0.05*   | 0.27**        | 0.11**  |
|                               | Buy fair trade | 0.17**     | 0.02    | 0.31**        | 0.05*   |
|                               | Recycle        | 0.24**     | 0.13**  | 0.32**        | 0.12**  |

Table 7. Regression of pro-environmental intentions onto attitudes, perceived behaviour control (PBC), subjective norms, personal norms and identities

|                | Avoid car use for major grocery shop            | Avoid car use for work                          | Not flying to holiday destination               | Buying Fair Trade coffee and tea                | Recycling                                       |
|----------------|---|---|---|---|---|
| <i>Step 1:</i> | $\Delta R^2 = 0.54$ $F(4, 1399)$<br>= 418.88*** | $\Delta R^2 = 0.61$ $F(4, 1391)$<br>= 552.03*** | $\Delta R^2 = 0.45$ $F(4, 1855)$<br>= 376.84*** | $\Delta R^2 = 0.38$ $F(4, 1634)$<br>= 249.26*** | $\Delta R^2 = 0.48$ $F(4, 1894)$<br>= 440.92*** |
| Attitude       | 0.17***   | 0.18***   | 0.27***   | 0.09***   | 0.17***   |
| Subj. norms    | -0.02   | -0.02   | 0.00  | 0.01  | 0.04*   |
| PBC            | 0.61***   | 0.66***   | 0.41***   | 0.28***   | 0.54***   |
| Personal norms | 0.12***   | 0.08***   | 0.18***   | 0.45***   | 0.16***   |
| <i>Step 2:</i> | $\Delta R^2 = 0.54$ $F(8, 1375)$<br>= 204.97*** | $\Delta R^2 = 0.61$ $F(8, 1366)$<br>= 271.77*** | $\Delta R^2 = 0.45$ $F(8, 1851)$<br>= 191.65*** | $\Delta R^2 = 0.41$ $F(8, 1608)$<br>= 139.01*** | $\Delta R^2 = 0.49$ $F(8, 1862)$<br>= 227.23*** |
| Attitude       | 0.17***   | 0.18***   | 0.27***   | 0.08***   | 0.15***   |
| Subj. norms    | -0.02   | -0.02   | 0.00  | 0.02  | 0.04*   |
| PBC            | 0.61***   | 0.66***   | 0.41***   | 0.27***   | 0.52***   |
| Personal norms | 0.11***   | 0.08***   | 0.16***   | 0.40***   | 0.13***   |
| IDhealth       | 0.01  | 0.01  | -0.02   | -0.01   | -0.01   |
| IDprice        | -0.03   | 0.03  | 0.02  | -0.04   | 0.01  |
| IDenvironment  | 0.02  | 0.00  | 0.06**  | 0.19***   | 0.12***   |
| IDfrugal       | 0.03  | 0.01  | 0.02  | -0.02   | -0.01   |

## Discussion

Secondary analyses were conducted on data from three studies. The analyses explored the relationships of identity and values on pro-environmental behaviour, and their relationship with two existing models of such behaviour: the TPB (Ajzen & Fishbein, 1974) and the NAM (Schwartz, 1977). It was hypothesised that identity would mediate the relationship between values and pro-environmental behaviour. Moreover, Study 3 examined whether identity would explain variance in intention towards pro-environmental behaviour over and above attitudes, perceived social norms, perceived behavioural control and personal norms (variables from TPB and NAM). The analyses showed full mediation by environmental identity of the relationship between biospheric values and 'green' behaviour, and between NEP and 'green behaviour' (study 2). In Study 1, a 'conscious consumer' identity was found to partially mediate the link between NEP and pro-environmental behaviour. Environmental identity was significantly related to intention to act pro-environmentally in all three studies and identities explained variance in specific pro-environmental behaviours alongside TPB and NAM variables. However, this did not hold for all pro-environmental behaviours measured. Moreover, although significant, identities appeared to contribute only a small amount of additional explanation. The hypotheses were therefore partially supported.

Although we found full mediation by environmental identity of the link between NEP and pro-environmental behaviour in Study 2, we found only partial mediation in Study 1. It is likely that this relates to the different operationalisations of the variables in the studies. Study 1 comprised only two behaviours, which specifically focused on buying Fair Trade and organic produce. These are relatively specific behaviours in that they both refer to (moral) buying behaviour. In Study 2, a wide range of different pro-environmental behaviours were combined. The variable in Study 2 may therefore have been a better reflection of general pro-environmental behaviour than the variable in Study 1 and is therefore more strongly related to environmental identities. Identities were also operationalised differently in both studies. Whereas Study 1 examined a range of identities and grouped these together into a hedonist and a conscious consumer identity, Study 2 examined more specific consumer identities. The independent and dependent variables in Study 2 therefore may have been more closely matched in operational terms. When the variables are operationalised at a similar level of specificity (e.g. general pro-environmental behaviour and environmental identities) full mediation is more likely to be found for general environmental values and for the New Environmental Paradigm.

The finding that identity is a significant predictor of intention to perform pro-environmental behaviours, alongside attitudes, subjective norms and perceived behavioural control from TPB, supports and extends previous work by Sparks and Shepherd (1992), Manetti *et al.* (2002), Nigbur *et al.* (2010) and others (see Conner & Armitage, 1998, for a review). The additional contribution of identity to intention in Study 3, however, was very small although this is in line with the findings of Conner and Armitage (1998).

Environmental identity was related to several, but not all, pro-environmental behaviours, an outcome suggested as likely by Conner and Armitage (1998). An environmental identity was related to recycling, buying Fair Trade, and avoiding flying on holiday, but not to reducing car use for work or shopping. The strongest predictor for four of the five behaviours was perceived behavioural control. So for avoiding car use, not flying to a holiday destination and recycling, intention to behave more sustainably was most strongly related to how easy the participants thought it would be. And this supports Kaiser and others who have argued that ease of action is critical (Kaiser & Wilson, 2004). Buying Fair Trade tea and coffee showed a different pattern. Personal norm was the strongest predictor. This could suggest that identities and personal norms become more important for behaviours in which the individual feels relatively free to act. In choosing consumer products, individuals may feel unconstrained and their behaviour may be guided more by how they see themselves, as 'green' or moral people for example. This could explain the findings of Sparks and Shepherd (1992) of identities contributing to 'green consumerism', and the findings of Nigbur *et al.* (2010), who suggested that their participants had complete freedom in choosing to recycle household waste. In contrast, where individuals feel that practical factors constrain how they act—the availability of alternatives to driving to work and going shopping, for example, these perceived constraints may dominate behaviour (see also Whitmarsh & O'Neill, 2010).

In this paper we argued that when studying pro-environmental behaviour, it is important to focus on variables which transcend specific situations but may help to promote such behaviours across a range of contexts and situations. Values and identities were presented as two such useful variables. To date most of the work on such aspects focuses on values and, in particular, environmental values such as the NEP (see Dietz *et al.*, 2005). This paper suggests that it may be worth further exploring the role of identities. We argued that identities may encapsulate a range of psychological variables including values and the studies presented in this paper support this hypothesis. Not only did we find that environmental identities tended to explain additional variance over and above value items, we also found that the link between values and pro-environmental behaviour was either fully or partially mediated by identities, suggesting that identities explained the variance accounted for by values as well as additional variance. Drawing on the rich theoretical basis of identity may help us to understand not only how identities may influence behaviour but also how they develop and are maintained (e.g. Breakwell, 1986). This offers a particularly fruitful avenue to study in order to promote changes in behaviours and to meet the longer term goal of the development of more sustainable lifestyles.

Drawing together the two main implications from the findings: that values (and perhaps TPB and NAM variables) are aspects of self-identity, and that identities will vary in the extent to which they guide particular sustainable behaviours, suggestions for future research and the promotion of pro-environmental behaviour may be made. Our finding that mediates the relationship between values and behaviour lends weight to, and refines, the argument of 'identity campaigning': not only values but self-identity more broadly are important as predictors of 'green' behaviour.

The relative salience of different identities may play a role. Identities develop over the lifespan. We may want to explore how an understanding of identity development could inform promotion of sustainable behaviour. Moreover, more work is needed on which identities, beyond an environmental identity, may contribute to sustainable behaviour. In this paper, we considered different identities and found positive relationships between them. This is congruent with theoretical understanding of identities as multiple (Stryker, 1980). Identities may not be disjoint and some may be complementary. We can see how an identity as health conscious may fit with a 'green' identity. Of particular interest in practice is the potential for specific behaviours to serve multiple identities: not eating meat and cycling for health reasons also serve a pro-environmental identity. This suggests that multiple identities may be of importance for environmentally friendly behaviours. This raises questions too about other identities—could an identity as 'a good citizen' or 'an upstanding member of the community' guide individuals towards more pro-environmental behaviours? Finally a fruitful path for future research will be to expand measures of identity to include factors such as attitudes, norms and self-efficacy. Such research should explore the boundaries of such factors to determine what, if any, components of attitudes, norms and self-efficacy may fall outside a conceptualisation of identity.

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