



Values, identity and pro-environmental behaviour

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Abstract:	<p>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 are more likely to affect behaviours across a variety of contexts. 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 2,694 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.</p>

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Keywords: Values, identity, pro-environmental behaviour

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3 1 Modern societies place a high value on economic prosperity. Individuals who live in these
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5 2 societies are continuously exposed to cultural values which promote the acquisition of wealth
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7 3 and material possessions. But there is increasing concern about the environmental damage
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9 4 engendered by current levels of consumerism (Jackson, 2009). It is therefore vital to promote
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11 5 pro-environmental behaviour and reduce consumption.
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17 7 Many behaviour change interventions focus on attitudes. A person's attitude towards pro-
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19 8 environmental behaviour can be a good predictor of such behaviour (see Staats, 2003).
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21 9 Attitudes are relatively easy to change and can alter with new information or circumstances
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23 10 (Ajzen, 2005). But attitudes tend to be measured with respect to a specific target object or
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25 11 event and are therefore relatively narrow. An attitude towards one behaviour may not
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27 12 necessarily be related to another behaviour. For instance, someone who has a positive attitude
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29 13 towards recycling glass bottles may be more likely to recycle glass bottles but they are not
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31 14 necessarily more likely to cycle to work or vote for a green party. Similarly pro-
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33 15 environmental behaviour in one domain does not necessarily correlate strongly with pro-
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35 16 environmental behaviour in another (e.g. Corraliza & Berenguer, 2000; Dolnicar & Grun,
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37 17 2009; Karp, 1996; Milfont, Duckitt, & Cameron, 2006; Oreg & Katz-Gerro, 2006) and
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39 18 engagement in one pro-environmental behaviour does not necessarily spillover to another one
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41 19 (Thøgersen & Ölander, 2003). Yet there is also consistency in individuals' behaviour
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43 20 (Thøgersen, 2004). Thøgersen (2004), suggests that spillover can occur, although it is more
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45 21 likely in behaviours that are conceptually similar (e.g., recycling glass or paper) than in
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47 22 behaviours which are very dissimilar (e.g., recycling glass and cycling to work). Indeed some
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49 23 go as far as to suggest that pro-environmental behaviour can in fact be perceived as a uni-
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51 24 dimensional concept rather than a multi-dimensional concept because such behaviours are
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53 25 linked through a common goal – protecting the environment (e.g. Kaiser & Wilson, 2004).
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6 2 It seems valuable then to examine the relative importance people attach to more general goals
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8 3 such as protecting the environment. And there is evidence to suggest that people who behave
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10 4 more pro-environmentally across contexts rate particular values highly (Thøgersen &
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12 5 Ölander, 2003). Pro-environmental behaviours may be influenced by more stable aspects of
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14 6 the self, such as values (Lindenberg & Steg, 2007; Schwartz & Bilsky, 1990) or self-identity
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16 7 (Sparks & Shepherd, 1992; Whitmarsh & O'Neill, 2010). Although the relative importance or
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18 8 salience of values and identities are to an extent context dependent (e.g., at work being a
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20 9 researcher is more important to me than being a mother) values and identities are generally
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22 10 stable factors that transcend specific situations. The extent to which you see yourself as an
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24 11 environmentally friendly person, for instance, is likely to be related to a wide range of pro-
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26 12 environmental behaviours including waste, transport and voting behaviours. These factors
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28 13 may operate to guide behaviours in multiple situations and thus offer broader ranging insights
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30 14 into determinants of 'green' behaviour. Indeed, some have argued that understanding and
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32 15 leveraging more fundamental aspects of the person such as values and identity is critical in
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34 16 moving towards sustainable behaviours (www.identity campaigning.org). Unless these
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36 17 deeper constructs are engaged, any change towards pro-environmental behaviour will be
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38 18 piecemeal, slow and disjointed, with each behaviour adopted or rejected separately by
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40 19 individuals, with the risk of 'rebound' ('greener' behaviour in one domain leading to less
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42 20 sustainable behaviour in another) undermining any gains (Crompton & Kasser, 2010;
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44 21 Druckman, Chitnis, Sorrell, & Jackson, 2011).
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55 23 There is significant evidence that values and identities play a role in explaining and
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57 24 predicting pro-environmental behaviour. However, very few studies have looked at values
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1 and identities simultaneously and we know little, therefore, about the relative importance of
2 each of these constructs in understanding pro-environmental behaviour.

3 4 *Self-identity*

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6 Self-identity refers to how an individual sees him/herself, and can encompass all aspects of
7 the self such as physical attributes, preferences, values, personal goals, habitual behaviour ,
8 personality traits and personal narratives (McAdams, 1995; Pillsbury, 1934). Individuals tend
9 to present themselves in ways that are congruent with their self-identity (Burke & Reitzes,
10 1991), and this extends to behaviour (Callero, 1985; Sparks & Shepherd, 1992) including
11 consumption (Dittmar, 2010; Oyserman, Fryberg, & Yoder, 2007). Although identity
12 represents an individual's subjective perspective on the self, identities are formed through
13 social interaction. Theorists in the symbolic interactionist tradition proposed the development
14 of the self through reflection from others in social exchanges (Breakwell, 1986; Mead, 1934)
15 and Stets and Burke (2000) proposed that identities develop through processes of self-
16 categorisation and identification. People thus develop multiple identities e.g., I am a woman,
17 I am a student, I am an environmentalist. Multiple identities are proposed as being managed
18 in a 'hierarchy of salience' (Stryker, 1984): identities vary in salience, and particular
19 identities, such as gender, are likely to be chronically salient.

20
21 Identities can form barriers to pro-environmental behaviours. Stradling, Meadows and Beatty
22 (1999) found that car drivers are less willing to reduce their car use when they derive a sense
23 of personal identity from driving, but can also motivate 'green' behaviour. A number of
24 studies have shown that an environmental identity, reflecting the extent to which people
25 indicate that environmentalism is a central part of who they are, increases engagement in pro-

1 environmental actions. For example, Whitmarsh and O'Neill (2010) found that people with a
2 'green' identity more often acted pro-environmentally. Similarly, Van der Werff, Steg and
3 Kaizer (2011) found that an energy saving identity was positively related to intentions to
4 conserve energy.

5
6 Exploring how the influence of identities on behaviour may be theoretically modelled,
7 several studies have considered identities in conjunction with the Theory of Planned
8 Behaviour (TPB; Ajzen & Fishbein, 1974). TPB proposed that intention to perform a
9 behaviour is predicted by three factors: attitudes (is it a good or bad thing to do), subjective
10 norms (what others think I should do) and perceived behavioural control (can I do it?).
11 Empirical results have demonstrated that, over and above these variables, identity can explain
12 behaviours including consumer behaviour (purchasing fashionable watches, trendy backpacks
13 and mobile phones; Manetti, Peirro and Livi, 2002), 'green' consumption (Sparks &
14 Shepherd, 1992) and recycling (Nigbur, Lyons, & Uzzell, 2010). The conclusion from these
15 studies was that the TPB should be extended to include identity as a predictor of behaviour.

16 17 *Values*

18 Values may be defined as "concepts or beliefs, [about] desirable end states or behaviours,
19 [which] transcend specific situations, [and] guide selection or evaluation of behaviour and
20 events, and are ordered by relative importance" (Schwartz & Bilsky, 1990, p. 878). Schwartz
21 (1992; 1990) developed a Values Inventory, comprising 56 'guiding principles in life' and his
22 work has been validated in many transnational studies. This research suggests that human
23 values can be grouped into 10 motivational domains and two dimensions (self-enhancement
24 versus self-transcendence and openness to change versus conservatism). Using Schwartz'
25 inventory, Stern (2000) and colleagues have suggested that three values underlie

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3 1 environmental concern: egoism, altruism and biospherism. De Groot and Steg (2007; 2008)
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5 2 further developed this idea, creating and evaluating among a wide range of samples, a short
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8 3 rating scale which measures these three value orientations.
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12 5 There are many other measures of environmental values (see Dietz, Fitzgerald & Shwom,
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15 6 2005 for an overview). The New Ecological Paradigm is the most commonly used (NEP;
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18 7 Dunlap, Van Liere, Mertig & Jones, 2000). It measures the extent to which people have an
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20 8 anthropocentric versus an ecocentric worldview. NEP has been shown to relate negatively to
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22 9 egoism, while biospherism is positively related (De Groot & Steg, 2008) and to self-
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25 10 transcendent values (Schultz & Zelezny, 1999). Stern and colleagues posited that general
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27 11 values are related to environmental concern (NEP) which is in turn related to specific
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29 12 personal norms (feelings of pride and guilt as predictors of altruistic behaviour; Schwartz,
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32 13 1977) and self-reported pro-environmental behaviour. Several studies have supported (parts
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34 14 of this) model (e.g. De Groot and Steg, 2007, 2008; Schultz & Zelezny, 1999).
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38 16 A final value concept that may be relevant when studying pro-environmental consumer
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41 17 behaviours is materialism. Richins (2004) developed a materialistic values scale (MVS) to
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43 18 measure 'the importance people ascribed to the ownership and acquisition of material goods
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45 19 in achieving major life goals or desired states' (p. 210). Negative correlations tend to be
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48 20 found between materialism and environmental concern (Banerjee and McKeage 1994; Brown
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51 21 and Kasser 2005; Clump et al. 2002; Gatersleben, White, Jackson, & Uzzell, 2010; Hirsh and
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53 22 Dolderman 2007; Kilbourne and Pickett 2008). The reason why these values may be
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55 23 negatively related is often explained on the basis of Schwartz's work on values (e.g.,
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58 24 Schwartz and Bilsky 1990). Materialism is strongly related to self-enhancement (Kilbourne,
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60 25 Grunhagen, & Foley, 2005; Richins, 2004) and egoism (Gatersleben et al., 2010) whereas

1 environmental concern is strongly related to self-transcendence (Schultz & Zelezny, 1999;
2 Stern & Dietz, 1994).

3 4 *Values, identity and behaviour*

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

16
17 Values are generally perceived as fairly distal determinants of behaviour which influence
18 behaviour via more proximal determinants, such as beliefs, specific attitudes and norms (e.g.
19 Eagly & Chaiken, 1993; Stern, Dietz, Kalof, & Guagnano, 1995). Identities, however, are
20 broader concepts encompassing many aspects of the self, including psychological processes
21 (including behaviours) which people may adopt for maintaining and protecting the self
22 (Breakwell, 1986). For instance, if being environmentally friendly is an important part of who
23 you are, recycling, voting for the green party and buying ecological products will all be
24 important things to do in order to express, maintain and protect that identity.

25

1 We propose then that values are components, even central components, of identity. Identity is
2 the theoretically broader construct, encompassing many other aspects of the self, such as self-
3 image, social roles (Stryker, 1984) and psychological processes for maintaining and
4 protecting the self (Breakwell, 1986). It can be suggested then that identity may mediate the
5 relationship between values and behaviours because values are part of ones identity. For
6 instance, if you describe yourself as an environmentally friendly person you are likely to hold
7 strong environmental values and behave pro-environmentally.

8
9 Although the NEP has been used extensively to measure pro-environmental values (Bell,
10 Greene, Fisher, & Baum, 2001), it is arguably a 'worldview' rather than a value (Whitmarsh
11 & O'Neill, 2010). As a 'worldview', NEP incorporates a range of aspects including beliefs
12 about human-nature relationships and beliefs about the state of environmental degradation.
13 Whereas values are likely to be central to identity, beliefs may be less so: a belief about the
14 relative depletion of natural resources, and the role of human behaviour in causing and
15 addressing these issues, is likely to have a basis in education and persuasion. Beliefs then
16 may be experienced as 'fact' by individuals, rather than as personal values. On this basis, we
17 would expect to find a stronger link between values and identities than between beliefs (NEP)
18 and identities.

19
20 The current research aims to explore in more detail the relationship between values, identity
21 and pro-environmental behaviours. The relationship between identity and two major theories
22 or planned behaviour (Theory of Planned Behaviour and Norm Activation Model) are also
23 investigated. Secondary analyses were conducted on three different data sets from studies
24 among UK residents. In each of these studies, questions were included on pro-environmental
25 behaviour, and on identity, values or both. In the analysis below, the first study examines the

1 extent to which identity may mediate the relationship between materialistic values (MVS,
2 Richins, 2004) and environmental values (NEP, Dunlap et al., 2000) on the one hand and
3 intentions to buy fair trade produce on the other. The second study examines the extent to
4 which identity mediates the link between biospheric, altruistic and egoistic values (De Groot
5 and Steg, 2007, 2008) and self-reported pro-environmental behaviour. The final study
6 examines whether identity explains variance in intentions to adopt a range of pro-
7 environmental behaviours, alongside variables from TPB (Ajzen & Fishbein, 1974) and
8 NAM (Schwartz, 1977).

10 **Study 1**

12 A survey study was conducted among English households in 2001 to examine community
13 engagement and attitudes and perceptions in relation to sustainable lifestyles. The survey was
14 distributed in two areas in England, one urban and one rural area. Respondents could win a
15 £70 voucher (approximately 115 euro or 100 US dollar) if they returned the completed
16 questionnaire in the freepost envelope provided. A total of 2,000 surveys were sent out and
17 266 were returned (a 13% response rate). Just over half the respondents came from the rural
18 area (54%), about two-thirds were female (64%). About a third of the respondents were
19 between 16 and 45 years old, another third was between 45 and 65 years old and the
20 remainder were 65 or older. The average annual income of the respondents ranged from less
21 than £10,000 to more than £100,000, with an average of around £35,000 (above the national
22 average of around £25,000; £1 ≈ 2 \$, and 1.5 Euro in 2007).

24 *Materialism* was measured with the MVS developed by Richins (2004). Scores could range
25 from 1 to 5; the mean score was calculated for each respondent across the 15 items of this

1 scale. The scale had a high internal consistency ($\alpha = .80$). Materialism was generally low (M
2 = 2.47, $SD = .51$). It was not related to age, gender or income.

3
4 *Environmental concern* was measured with the NEP (Dunlap et al., 2000). Environmental
5 concern was generally high ($\alpha = .78$; $M = 3.69$, $SD = .52$; 1 = low, 5 = high). Environmental
6 concern was not related to age, gender or income. But it was negatively related to materialism
7 ($r = -.19$, $p = .03$).

8
9 *Pro-environmental behaviour* was measured by asking respondents how often they buy Fair
10 Trade food products and organic food products. These two items were combined into one
11 variable by calculating the mean score across them ($M = 2.71$, $SD = .96$) Buying behaviour
12 was positively related to income ($r = .29$, $p < .001$) but not to age or gender.

13
14 *Identity*. Eleven consumer types were presented, and participants were asked to what extent
15 they considered themselves to be, for example, health conscious or frugal. Factor analyses
16 revealed three factors explaining 54% of the variance in total. The first factor (explaining
17 20% of the variance) captured the extent to which respondents perceived themselves to be
18 consumerist (fashion conscious, reckless, self-indulgent, compulsive, and not cautious). The
19 second factor (explaining 20% of the variance) captured the extent to which respondents
20 perceived themselves to be 'sensible consumers' (health conscious, green, fitness conscious,
21 ethical). The third factor grouped the remaining two items (eco-centric and a non-consumer).
22 On the basis of the first two factors, two new variables were created by calculating the means
23 over items which had factor loadings of .50 or above on the relevant factor in the rotated
24 factor solution: "consumerist identity" ($\alpha = .66$; $M = 2.27$, $SD = .61$) and "sensible
25 consumer" ($\alpha = .66$; $M = 3.51$, $SD = .63$). The extent to which respondents identified as a

1 sensible consumer was not related to age and gender. However, females were more likely to
2 identify with a consumerist identity ($M = 2.35$, $SD = .60$) than male respondents ($M = 2.13$,
3 $SD = .60$; $t = 2.80(259)$, $p = .006$). Moreover, income was positively related to identifying
4 with a sensible consumer identity ($r = .17$, $p = .007$) as well as a consumerist identity ($r = .17$,
5 $p = .008$).

7 *Results*

8 Simple correlations were computed to examine the link between identities and values.

9 Materialistic values (MVS) are positively related to a consumerist identity ($r = .28$, $p < .001$)
10 and not significantly related to the NEP. The extent to which respondents saw themselves as
11 sensible consumers was positively related to NEP ($r = .16$, $p = .10$) but not to MVS.

12
13 Regression analyses were conducted to examine whether values are related to pro-
14 environmental behaviours. Environmental concern was positively related to pro-
15 environmental behaviour and materialism was not significantly related (Step 1, Table 1).
16 When identities were included in the regression (Step 2), significantly more variance was
17 explained ($\Delta R^2 = .20$, $F(2,254) = 34.90$, $p < .001$). Both consumerist and sensible consumer
18 identities were related to pro-environmental behaviour. When identities were included, the
19 relationship between environmental values and behaviours was weaker, suggesting that
20 identities mediate the link between values and behaviours. To test this a Sobel mediation test
21 was conducted (Baron & Kenny, 1986). The Sobel test for the sensible consumer identity was
22 significant ($z = 2.28$, $p = .01$), showing that this identity mediated the relationship between
23 NEP and pro-environmental behaviour. Mediation was partial with a small significant
24 relationship remaining when identity was included.

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Table 1 about here

Study 2

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. One thousand surveys were sent out in 2009, and 135 were returned (a response rate of 13.5%), of which 36% was from the North. Just under half of the respondents were female (47%). The sample was relatively old. 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 the national median wage of around £25,000 with a third of the sample earning more than £50,000 per annum. (£1 ≈ \$1.7, 1.1 euro 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 = .68) and environmental identity (M = 3.50, SD = .85) scale showed very good reliability (Cronbach α > .80), the moral identity scale showed good reliability (α = .70; M = 3.78, SD = .66) but the frugal identity scale showed very poor reliability (.25) which could be improved significantly (α = .84; M = 3.96, SD = .82) upon removal of one item (‘As a person it is important to me that I attempt not to be wasteful’).

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2 A higher income was negatively related to environmental ($r = -.29, p = .001$), moral ($r = -.35, p < .001$) and frugal identity ($r = -.27, p = .003$). Older people in the sample were also more frugal ($r = .20, p = .02$). Women were more likely to identify with an environmental conscious consumer identity ($M = 3.71, SD = .77$) than men ($M = 3.32, SD = .88; t = 2.69 (131), p = .008$). They were also more likely to identify with a moral consumer identity ($M = 3.92, SD = .59$) than men were ($M = 3.66, SD = .70; t = 2.24 (131), p = .027$).

9 *Values.* Values were measured by means of the values scale developed by De Groot & Steg (2007). 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 .71 ($M = 2.55, SD = 1.31$); for the 4 altruistic values (social justice, equality, peace, being helpful) was .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 .89 ($M = 5.07, SD = 1.44$). Values were not related to age, gender or income.

19 *Pro-environmental behaviour.* Respondents indicated how often they adopted 20 pro-environmental behaviours, on a 5-point scale (1 = never, 5 = always). These included behaviours (lowering thermostat) as well as recycling, food and transport behaviours. One scale was computed on the basis of these questions and showed good reliability ($\alpha = .83; M = 3.44, SD = .50$). Those with a higher income were less likely to adopt pro-environmental behaviours ($r = -.23, p = .008$). Women were more likely to adopt pro-environmental behaviours ($M = 3.66, SD = .42$) than men ($M = 3.25, SD = .48; t = 5.24 (133), p < .001$).

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6 2**Results**

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8 3 Simple correlations explored the relationship between values and identities. Moderate to
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10 4 strong relationships were found (see Table 2). Both biospheric values and NEP were strongly
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12 5 related to environmental identity. This suggests there may be overlap between the value and
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14 6 identity concepts, especially where they share related goals, such as environmental
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16 7 conservation or morality.
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27 11 Regression analyses were then conducted to investigate relative contributions to variance in
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29 12 pro-environmental behaviours. A step-wise regression was carried out, with values included
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31 13 in the first step, and four identities added to the equation in the second step. Table 3 presents
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33 14 the results. In Step 1, a biospheric value was the only significant predictor. Step 2, which
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35 15 includes identities, explained significantly more variance (18%; $\Delta R^2 = .18$, $F(4,121) = 10.38$,
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37 16 $p < .001$). Two identities contributed significant variance –environmental and frugal identities
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39 17 - and biospheric values become non-significant. Sobel tests showed that biospheric values
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41 18 were fully mediated by environmental identity (B becomes non-significant; $z = 4.65$, $p <$
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43 19 $.001$) and partially mediated by frugal identity ($B = .11$, $p < .001$; $z = 3.46$, $p < .001$).
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1 As in Study 1, NEP was significantly related to pro-environmental behaviour (see Table 4).
2 Adding identities to this simple regression explained an additional 36% of the variance in
3 reported behaviours ($\Delta R^2 = .36$; $F(4,127) = 21.98$, $p < .001$). Sobel tests showed that the link
4 between NEP and pro-environmental behaviour was fully mediated by environmental identity
5 ($B = .06$, error $B = .07$, $p = .411$; $z = 5.03$, $p < .001$) and partially mediated by frugal identity
6 ($B = .30$, error $B = .05$, $p = .002$.; $z = 2.73$, $p < .001$).

8 **Study 3**

9
10 An on-line survey was developed in 2007 by a commercial marketing research company on
11 behalf of a major media group in the UK. The survey link was advertised in a range of media
12 owned by this group (television, radio and magazines). Potential participants were offered a
13 chance to win a range of prizes for participating in the study. The survey consisted of nearly
14 600 questions, most of which focused on media use (commercial television, radio and
15 magazines), with some final questions on pro-environmental behaviours and identity.
16
17 A total number of 2293 people participated in the survey. The majority lived in England
18 (76%), around 5% each lived in Wales, other European countries or the US. Around a third of
19 the respondents were between 40 and 80 years of age, a third was between 28 and 40 and
20 another third was between 16 and 28 years old, making the sample relatively young. Just over
21 half of the respondents (52%) were female. Over a quarter (28%) earned less than £25,000
22 (approximately the UK median wage) and 17% earned more than £50,000 (£1 \approx 2 \$, and 1.5
23 Euro in 2007).
24

1 *Pro-environmental attitudes and behaviours.* Questions were asked about five behaviours:
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4 1 three with negative environmental impact (using your car for grocery shopping, using a car
5
6 2
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8 3 for travelling to work, using an aeroplane to go on holiday) and two with positive impact
9
10 4 (buying Fair Trade coffee or tea and recycling household waste). All scales had 5 scale
11
12 5 points. For each of these behaviours, respondents were asked one question on *intention* ('To
13
14 6 what extent do you intend to... the next time you ...'; 1 = definitely not, 5 = definitely), and
15
16 7 one question on *perceived behavioural control* ('How easy is it for you to...'; 1 = very
17
18 8 difficult, 5 = very easy). Both of these questions were phrased with respect to sustainable
19
20 9 behaviours, for example, 'To what extent do you intend to avoid using your car the next time
21
22 10 you travel to work?' One question for each behaviour was asked on *attitude* ('What is your
23
24 11 attitude towards', 1 = Strongly disapprove, 5 = Strongly approve), one question on
25
26 12 *subjective norm* ('What is the attitude of your friends towards', 1 = Strongly disapprove,
27
28 13 5 = Strongly approve), and *personal norm* ('I feel guilty when I ...', 1 = Strongly disagree, 5
29
30 14 = Strongly agree). These three questions were phrased with respect to non-sustainable
31
32 15 behaviours. Table 4 presents means and standard deviations. For clarity, the table depicts all
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34 16 variables with respect to sustainable behaviour, and reverses the scores on attitudes and
35
36 17 subjective norms.
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46 19 Only very weak relationships were found with age, gender or income. All significant
47
48 20 correlations were low (one of .15, and the remainder below .10). Of note is that there appears
49
50 21 to be a generally linear progression for all variables across the behaviours. That is, intention,
51
52 22 attitude, perceived behavioural control, subjective and personal norms for buying Fair Trade
53
54 23 products were stronger than for avoiding flying on holiday, which in turn was stronger than
55
56 24 the avoidance of car use for shopping. Repeated measures analyses showed significant linear
57
58 25 increases in intentions ($F(1,1654) = 3287.89, p < .001$), attitudes ($F(1,2257) = 3257.90, p <$

1 .001), subjective norm ($F(1,1646) = 1434.66, p < .001$), personal norms ($F(1,1656) =$
2 $2170.97, p < .001$) and perceived behavioural control ($F(1,1505) = 3048.88, p < .001$) in the
3 order in which the variables are presented in Table 5.

4
5 Table 5 about here
6

7 *Identity* was measured by asking respondents to what extent they agreed that they were a
8 health conscious consumer ($M = 3.57, SD = .87$), a price conscious consumer ($M = 3.94, SD$
9 $= .84$), an environmentally friendly consumer ($M = 3.37, SD = .83$) and a frugal consumer (M
10 $= 3.22, SD = .86$; 5-point scale anchored at 1 = Strong disagree, 5 = Strong agree. These
11 identities were analysed separately. Only very weak correlations were found between
12 identities and demographic variables (all correlations were below .15, most below .10).

13 14 **Results**

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

19
20 Table 6 about here
21

22 For each of the five behaviours, we conducted a stepwise regression (see Table 7): in the first
23 step, intention towards pro-environmental behaviour was regressed onto TPB and NAM
24 variables; in the second step, identities were added to the equation. For car use to work and
25 for shopping, TPB and NAM variables appeared to be good predictors of intentions and

1 identities did not explain additional variance. For reducing holiday flights, buying Fair Trade
2 and recycling, however, we found a significant contribution of identities. In particular,
3 environmental identity explained additional variance in each case for each of the behaviours
4 over and above the TPB and NAM variables with 1% ($\Delta R^2=.005$, $F(4,1851) = 4.01$, $p = .003$)
5 added for not taking holiday flights, 3% for buying Fair Trade ($\Delta R^2=.028$, $F(4,1608) = 18.81$,
6 $p < .001$) and 1% for recycling ($\Delta R^2=.011$, $F(4,1862) = 10.46$, $p < .001$).

7
8 Table 7 about here
9

10 Discussion

11 Secondary analyses were conducted on data from three. The analyses explored the
12 relationships of identity and values on pro-environmental behaviour, and their relationship
13 with two existing models of such behaviour (the Theory of Planned Behaviour (TPB) and the
14 Norm Activation Model (NAM)). It was hypothesised that identity would mediate the
15 relationship between values and pro-environmental behaviour, and that identity would
16 explain variance in intention towards pro-environmental behaviour over and above variables
17 from TPB and NAM. The analyses showed full mediation by environmental identity of the
18 relationship between biospheric values and 'green' behaviour as well as the NEP (in Study
19 2). In Study 1 partial mediation was found for NEP. Environmental identity was significantly
20 related to intention to act pro-environmentally in all three studies and identities explained
21 variance in specific pro-environmental behaviours alongside TPB and NAM variables.
22 However, this did not hold for all pro-environmental behaviours measured. Moreover,
23 although significant, identities appeared to contribute only a small amount of additional
24 explanation. The hypotheses were therefore partially supported.

1 It is not clear why we found full mediation of the link between NEP and pro-environmental
2 behaviour in Study 2 and only partial mediation in Study 1. It is most likely that this has
3 something to do with the different operationalisations of the variables in both studies. Study 1
4 only included 2 behaviours which specifically focused on buying fair trade and organic. They
5 are relatively specific behaviours in that they both refer to (moral) buying behaviour. In
6 Study 2 a wide range of different pro-environmental behaviours were combined. The variable
7 in Study 2 may therefore have been a better reflection of general pro-environmental
8 behaviour than the variable in study 1 and therefore more strongly related to environmental
9 identities. Identities were also operationalised differently in both studies. Whereas study 1
10 examined a range of identities and grouped these together into a consumerist and a sensible
11 consumer identity, study 2 examines more specific consumer identities. The independent and
12 dependent variables in study 2 therefore may have been more closely matched in operational
13 terms. When the variables are operationalised at a similar level of specificity (e.g., general
14 pro-environmental behaviour and environmental identities) full mediation is likely to be
15 found not only for general environmental values but also for the New Environmental
16 Paradigm. This is against what we had expected to find. As indicated, NEP is a 'worldview'
17 rather than a value (Whitmarsh & O'Neill, 2010) and as such it incorporates a range of
18 aspects including beliefs. We had expected to find a stronger link between values and
19 identities than between beliefs and identities but this is only partially supported by the
20 findings (in Study 1 and not in Study 2). Further research is needed to evaluate to what extent
21 NEP has both belief and value components, and this should be considered in using NEP to
22 measure values in future research.

23
24 The finding that identity is a significant predictor of intention to perform pro-environmental
25 behaviours, alongside attitudes, subjective norms and perceived behavioural control from

1
2
3 1 TPB, supports and extends previous work by Sparks and Shepherd (1992), Manetti et al.
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5 2 (2002), Nigbur et al. (2010) and others (see Conner & Armitage, 1998, for a review). The
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7 3 additional contribution of identity to intention in Study 3, however, was very small although
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9 4 this is in line with the findings of Conner and Armitage (1998).
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11 5
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13 6 A varied relationship was found between an environmental identity and green behaviours, an
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15 7 outcome suggested as likely by Conner and Armitage (1998). An environmental identity was
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17 8 related to recycling, buying Fair Trade, and avoiding flying on holiday, but not to reducing
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19 9 car use for work or shopping. The strongest predictor for four of the five behaviours was
20
21 10 perceived behavioural control. So for avoiding car use, not flying to a holiday destination and
22
23 11 recycling, intention to behave more sustainably was most strongly related to how easy the
24
25 12 participants thought it would be. And this supports Kaiser and others who have argued that
26
27 13 ease of action is critical (Kaiser and Wilson, 2004). Buying Fair Trade tea and coffee showed
28
29 14 a different pattern. Personal norm was the strongest predictor. This could suggest that
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31 15 identities and personal norms become more important for behaviours in which the individual
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33 16 feels relatively free to act. In choosing consumer products, individuals may feel
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35 17 unconstrained and their behaviour may be guided more by how they see themselves, as
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37 18 'green' or moral people for example. This could explain the findings of Sparks and Shepherd
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39 19 (1992) of identities contributing to 'green consumerism', and the findings of Nigbur and
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41 20 colleagues (2010), who suggested that their participants had complete freedom in choosing to
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43 21 recycle household waste. In contrast, where individuals feel that practical factors constrain
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45 22 how they act – the availability of alternatives to driving to work and going shopping, for
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47 23 example, these perceived constraints may dominate behaviour.
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3 1 In this paper we argued that when studying pro-environmental behaviour it is important to
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5 2 focus on variables which transcend specific situations but may help to promote such
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7 3 behaviours across a range of contexts and situations. Values and identities were presented as
8
9 4 two such useful variables. To date most of the work on such aspects focuses on values and in
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11 5 particular environmental values such as the NEP (see Dietz et al., 2005). This paper, suggests
12
13 6 that it may be worth further exploring the role of identities. We argued that identities may
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15 7 encapsulate a range of psychological variables including values and the studies presented in
16
17 8 this paper support this hypothesis. Not only did we find that environmental identities tended
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19 9 to explain additional variance over and above value items, we also found that the link
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21 10 between values and pro-environmental behaviour was either fully or partially mediated by
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23 11 identities suggesting that identities explained all the variance in such behaviour that values
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25 12 did as well as additional variance. Identities are therefore worth exploring in more detail as
26
27 13 identity theory has a rich theoretical basis which helps us to understand not only how
28
29 14 identities may influence behaviour but also how identities develop and are maintained (e.g.,
30
31 15 Breakwell, 1986). This may be particularly fruitful to study in more detail in order to help
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33 16 understand and promote changes in behaviours and to provide a longer term perspective of
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35 17 the development of more sustainable lifestyles.
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46 19 Drawing together the two main implications from the findings: that values (and perhaps TPB
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48 20 variables) are aspects of self-identity, and that identities will vary in the extent to which they
49
50 21 guide particular sustainable behaviours, suggestions for future research and promotion of pro-
51
52 22 environmental behaviour may be made. Identity is a particularly promising concept to study,
53
54 23 as we have shown that it mediates the relationship between values and behaviour. This lends
55
56 24 weight to, and refines, the argument of 'identity campaigning': not only values but self-
57
58 25 identity more broadly are important as predictors of 'green' behaviour. The relative salience
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1 of different identities may play a role. Identities develop over the lifespan – how could an
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1 of different identities may play a role. Identities develop over the lifespan – how could an
2 understanding of identity development inform promotion of sustainable behaviour?
3 Moreover, more work is needed on which identities, beyond an environmental identity, may
4 contribute to sustainable behaviour – could an identity as ‘a good citizen’ or ‘an upstanding
5 member of the community’ guide individuals towards more pro-environmental behaviours?
6 finally a fruitful path for future research will be to expand measures of identity to include
7 factors such as attitudes, norms and self-efficacy. Such research should explore the
8 boundaries of such factors to determine what, if any, components of attitudes, norms and self-
9 efficacy may fall outside a conceptualisation of identity.

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

	Step 1			Step 2		
	B	ErrorB	β	B	ErrorB	β
(Constant)	3.53	.57		5.74	.57	
MVS	-.17	.12	-.09	-.23	.11	-.12*
NEP	.34	.12	.18**	.21	.10	.12*
IDconsumerist				.26	.09	.17**
IDSensible				.63	.08	.42***

Note. Multicollinearity between identities was not detected. * $p < .05$; ** $p < .01$; *** $p < .001$.

Table 2. Correlations between values and identities

		Identity			
		health	environment	moral	frugal
Values	Biospheric	.37**	.68**	.52**	.42**
	Egoistic	.32***	.20*	.30**	.10
	Altruistic	.34***	.46***	.57***	.38**
NEP		.09	.48***	.27**	.27**

Note * $p < .05$, ** $p < .01$, *** $p < .001$

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

	Step 1			Step 2		
Adj R2	.26; F(3,127) = 16.05***			.43; F(7,121) = 14.90***		
	B	Std. Error	Beta	B	Std. Error	Beta
(Constant)	2.38	.17		1.61	.24	
Value Biospheric	.13	.03	.40***	.03	.04	.09
Value Egoistic	.04	.03	.11	.01	.03	.01
Value Altruistic	.06	.04	.14	.02	.04	.05
IDhealth				.03	.06	.04
IDenvironment				.21	.07	.35**
IDmoral				.02	.07	.03
IDfrugal				.17	.05	.28**

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		
Adj R2	.12; F(1,123) = 19.52***			.47; F(5,127) = 23.99***		
	B	Std. Error	Beta	B	Std. Error	Beta
(Constant)	2.21	.28		1.51	.31	
NEP	.35	.08	.36***	.06	.07	.06
IDhealth				.00	.06	.01
IDenvironment				.27	.06	.45**
IDmoral				.06	.06	.07
IDfrugal				.15	.05	.25**

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

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

		Avoid car use for major grocery shop	Avoid car use for work	Not flying to holiday destination	Buying Fair Trade coffee and tea	Recycling
Intention	M	1.93	2.38	2.47	2.90	4.43
	SD	(1.21)	(1.64)	(1.26)	(1.10)	(1.04)
Attitude ^a	M	2.53	2.83	2.62	3.00	4.23
	SD	(.86)	(.92)	(.86)	(.76)	(.99)
PBC	M	1.93	2.35	2.65	3.72	4.07
	SD	(1.17)	(1.54)	(1.23)	(1.07)	(1.19)
Subjective norms ^a	M	2.43	2.53	2.45	2.95	3.63
	SD	(.83)	(.84)	(.80)	(.65)	(.98)
Personal norms	M	2.18	2.38	2.33	2.69	3.83
	SD	(1.01)	(1.11)	(1.04)	(1.05)	(1.16)

Note. ^a Score reversed.

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

		Identities			
		health	price	environmental	frugal
Attitude	Car use shop	-.05*	.03	-.10**	-.05*
	Car use work	-.07**	.01	-.13**	-.04*
	Fly holiday	-.08**	-.04*	-.18**	-.09**
	Buy fair trade	-.04*	.00	-.11**	-.04*
	Recycle	-.17**	-.06**	-.28**	-.06**
Perceived behavioural control	Car use shop	-.01	-.08**	.00	.00
	Car use work	.00	.00	.03	-.01
	Fly holiday	-.03	.02	.05*	.07**
	Buy fair trade	.13**	-.03	.12**	.01
	Recycle	.10**	.02	.26**	.03
Subjective norms	Car use shop	-.02	.05*	-.03	-.02
	Car use work	-.04	.01	-.07**	.01
	Fly holiday	-.04	-.02	-.06**	-.05*
	Buy fair trade	.01	-.02	-.02	-.04
	Recycle	-.11**	-.05*	-.12**	-.06*
Personal norms	Car use shop	.14**	.00	.21**	.06**
	Car use work	.15**	.04	.22**	.06*
	Fly holiday	.16**	.05*	.27**	.11**
	Buy fair trade	.17**	.02	.31**	.05*
	Recycle	.24**	.13**	.32**	.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
Step 1. Adj R2	.54	.61	.45	.38	.48
	F(4,1399) = 418.88***	F(4,1391) = 552.03***	F(4,1855) = 376.84***	F(4,1634) = 249.26***	F(4,1894) = 440.92***
Attitude	.17***	.18***	.27***	.09***	.17***
Subj. norms	-.02	-.02	.00	.01	.04*
PBC	.61***	.66***	.41***	.28***	.54***
Personal norms	.12***	.08***	.18***	.45***	.16***
Step 2. Adj R2	.54	.61	.45	.41	.49
	F(8,1375) = 204.97***	F(8,1366) = 271.77***	F(8,1851) = 191.65***	F(8,1608) = 139.01***	F(8,1862) = 227.23***
Attitude	.17***	.18***	.27***	.08***	.15***
Subj. norms	-.02	-.02	.00	.02	.04*
PBC	.61***	.66***	.41***	.27***	.52***
Personal norms	.11***	.08***	.16***	.40***	.13***
IDhealth	.01	.01	-.02	-.01	-.01
IDprice	-.03	.03	.02	-.04	.01
IDenvironment	.02	.00	.06**	.19***	.12***
IDfrugal	.03	.01	.02	-.02	-.01