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It is a moral issue: The relationship between environmental self-identity, obligation-based intrinsic motivation and pro-environmental behaviour

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ABSTRACT

In order to effectively mitigate climate change, people need to adopt environmentally-friendly actions. We argue that some people act in an environmentally-friendly manner without external incentives to do so, but rather because they are intrinsically motivated to do so. There is some initial evidence to suggest that this is particularly likely for people with a strong environmental self-identity. However, not much is known about how environmental self-identity influences pro-environmental actions. In this research, we aimed to test whether, and if so, via which process environmental self-identity is related to environmentally-friendly behaviour. We conducted three studies to test our hypotheses. In the first study, our hypotheses were confirmed in a sample of the general population using a correlational design. In the second study, we replicated our findings with a different indicator of moral obligation and with a different dependent variable. In the third study, we tested our model in an experimental design. Again, we found support for our hypotheses that environmental self-identity is related to one's obligation-based intrinsic motivation (that is, feelings of moral obligation) to act pro-environmentally, which in turn affects pro-environmental actions. As expected, the obligation-based intrinsic motivation mediates the relationship between environmental self-identity and environmentally-friendly behaviour. Our findings suggest that strengthening environmental self-identity may be a cost-effective way to promote pro-environmental actions, as people with a strong environmental self-identity are likely to act in an environmentally-friendly manner without an external incentive to do so.

In order to effectively mitigate climate change, people need to adopt environmentally-friendly actions (IPCC, 2007). Policy makers often try to promote environmentally-friendly behaviour by providing external incentives as to make the pro-environmental behaviour more attractive or to make the environmentally-unfriendly behaviour less attractive. But are such external incentives always needed? Research suggests that some people act in an environmentally-friendly manner even though it is not extrinsically rewarding, and that some people act pro-environmentally in spite of it being costly or effortful (e.g., Steg et al., 2012). These people are likely to be intrinsically motivated to act in an environmentally-friendly manner. When people are intrinsically motivated, the motivation comes from within the individual, rather than from external rewards (Frey, 1997). But why would people be intrinsically motivated to act pro-environmentally? We propose that environmental self-identity, that is, the extent to which one sees oneself as a type of person whose actions are environmentally-friendly, plays an important role in this process.

Research in the environmental domain showed that one's self-identity, that is, the label one uses to describe oneself (Cook et al., 2002), is an important predictor of environmental actions. Specific types of environmental self-identity appeared to be related to a range of pro-environmental actions, including eco-shopping, energy conservation, pro-environmental behaviours, recycling and environmental activism (Whitmarsh and O'Neill, 2010; Gatersleben et al., 2012; Nigbur et al., 2010; Fielding et al., 2008). We focus on one's general environmental self-identity, which we define as the extent to which one sees oneself as a type of person whose actions are environmentally-friendly. People with a strong environmental self-identity more strongly see themselves as an environmentally-friendly person and are more likely to act pro-environmentally than those with a weak environmental self-identity. However, not much is known about the process through which self-identity is related to environmental behaviour. Learning more about why people act in an environmentally-friendly manner and if and how self-identity affects such actions will provide more insight into how pro-environmental behaviour

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can be promoted. The aim of the current research is to study if environmental self-identity influences environmental actions, and if so, via which process environmental self-identity influences environmental actions.

Studies on the relationship between environmental self-identity and pro-environmental actions (reported above) suggests that people with a strong environmental self-identity are likely to act in an environmentally-friendly manner when there are no external incentives to do so, as behaviours such as eco-shopping and environmental activism typically involve additional costs or effort. Does this mean that people with a strong environmental self-identity are intrinsically motivated to act in an environmentally-friendly manner? This is not a trivial question, as understanding ways to strengthen one's intrinsic motivation may be an important and cost-efficient way to promote pro-environmental behaviour, because no external incentives (e.g., financial rewards) are needed. In this research, we will test if environmental self-identity is related to environmental behaviour via one's intrinsic motivation to do so.

1. Two types of intrinsic motivation

We argue that two different types of intrinsic motivation should be distinguished: enjoyment-based intrinsic motivation, reflecting whether the behaviour itself is enjoyable to do, and obligation-based intrinsic motivation, reflecting whether one feels obliged to follow a particular rule, norm or principle (which may result in pleasant feelings; Lindenberg, 2001). Enjoyment-based intrinsic motivation is similar to the definition of intrinsic motivation in self-determination theory (Ryan and Deci, 2000). They define intrinsic motivation as performing behaviour because it is interesting or enjoyable by itself. Obligation-based intrinsic motivation is similar to their definition of introjected regulation, which they define as being motivated out of a sense of obligation related to approval from oneself or others (Ryan and Deci, 2002). Hence, whereas Deci and Ryan define intrinsic motivation as performing a behaviour because it is enjoyable to do so (and therefore is enjoyment-based), we argue that besides, intrinsic motivation can be obligation-based. Obligation-based intrinsic motivation is similar to personal norm, which is defined as feeling morally obliged to perform a behaviour (Schwartz, 1973). According to Lindenberg (2001), leisure activities are more likely to be related to enjoyment-based intrinsic motivation, whereas civic behaviours (e.g., tax paying, voting) are more likely to be related to obligation-based intrinsic motivation as such actions are mostly not enjoyable to do so as such, but they may elicit positive feelings by contributing to the good cause. Indeed, when a task is not very interesting or enjoyable, (enjoyment-based) intrinsic motivation, in the sense of the behaviour being fun to perform, becomes less relevant for performing this task (Vallerand et al., 2008).

As most pro-environmental behaviours are not fun to perform either, we think the obligation-based intrinsic motivation is particularly relevant for environmental behaviour, while enjoyment-based intrinsic motivation is less relevant in the environmental domain. Many environmentally-friendly actions are associated with more effort and less pleasure. For example, showering for shorter periods means less comfort, using green energy may be more of a hassle, cycling is more effortful than driving, and reducing the temperature setting in the house reduces comfort. Hence, many pro-environmental behaviours are probably not performed because the behaviour itself is pleasurable. Indeed, research showed that people who more often perform pro-environmental actions reported a stronger intrinsic motivation to perform these actions than people who less often act in an environmentally-friendly manner (Pelletier et al., 1998). However, in this study the items measuring intrinsic motivation did not focus on enjoying the pro-environmental actions for its own sake, but they focused on the pleasure derived from contributing to improving environmental quality. Hence, they did not study whether people engaged in pro-environmental action because of the inherent pleasure for doing so (enjoyment-based intrinsic motivation), but whether people derived pleasure from doing the right thing (in this case, acting pro-environmentally, thus reflecting obligation-based intrinsic motivation). In addition, recent research shows that people with strong hedonic values (who strive for pleasure in life) are likely to refrain from pro-environmental behaviour, probably because these behaviours are not pleasurable or fun or because they reduce comfort (Steg et al., 2012). This suggests that it is less likely that people are intrinsically motivated to act in an environmentally-friendly manner because of the fun of doing so (i.e., enjoyment-based intrinsic motivation). Instead we expect that environmental self-identity influences behaviour via one's obligation-based intrinsic motivation (i.e., via a moral route), namely that people with a strong environmental self-identity will be more likely to feel morally obliged to act pro-environmentally.

We thus propose that environmental self-identity influences behaviour because it elicits feelings of moral obligation to do so. Some support for this reasoning is found in research on collective action. Like environmental behaviour, collective action (e.g., joining a demonstration) is likely to be associated with more effort and less pleasure. Van Zomeren et al. (2012) found that moral convictions are important for collective action to occur. If people feel strongly about a moral issue they are more likely to engage in collective action. The study showed that this is particularly true for people with identities with a strong normative content (indicating what one ought to do; such as acting pro-environmentally when environmental self-identity is strong), suggesting that people with a strong normative identity are more likely to experience moral feelings and to act in line with their identity. Our line of reasoning is also supported by research that showed that people experience guilt when they do not act in line with their moral identity (Stets and Carter, 2012). This suggests that people with a strong environmental self-identity may be motivated to act morally (i.e., pro-environmentally) because they feel obliged to do so. Not acting in line with a sense of moral obligation to do so may lead to feelings of guilt (Schwartz, 1970). However, this correlational study tested whether people with a moral identity feel guilty after refraining from moral actions. We propose that in addition, people anticipate these feelings, that is, they are motivated to act in line with their identity because they anticipate feeling guilty if they would not act in an environmentally-friendly manner.

2. Aim of the current research

In the current research we will test if environmental self-identity indeed influences pro-environmental actions via a moral route, thus via an obligation-based intrinsic motivation. More, specifically, we test the model in Fig. 1. We first hypothesized that environmental self-identity is related to the obligation-based intrinsic motivation, that is, feelings of moral obligation to act in an environmentally-friendly manner (Hypothesis 1). Second, we hypothesized that feelings of moral obligation to act in an environmentally-friendly manner mediate the relationship between environmental self-identity and environmental intentions (Hypothesis 2). We tested these hypotheses in three studies. In our first study, we tested our hypotheses in a sample of the general population using a correlational design. In the second study, we aimed to replicate our findings with a different indicator of moral obligation and with a different dependent variable as replication is considered a key criterion to establish the validity and reliability of

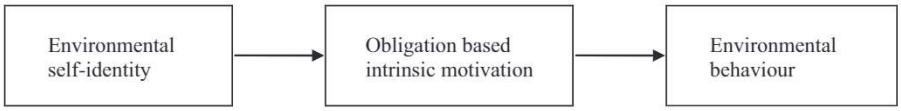

Fig. 1. The relationship between environmental self-identity, obligation based intrinsic motivation and environmental behaviour.

results (McCrae et al., 1996; Koole and Lakens, 2012). In the third study, we tested our model in an experimental design. More specifically, we tested if people feel more strongly morally obliged to act in an environmentally-friendly manner, and act in line with their moral obligation, when environmental self-identity has been strengthened.

3. Study 1

3.1. Method

3.1.1. Participants and procedure

Data were collected via an online questionnaire among a sample of the Dutch population. Participants were members of the panel of thesistools.com, and received a small reimbursement for their participation (less than 1 Euro). The questionnaire was online for 14 days in November 2010. The study was presented to participants as a study on energy use. In total, 138 participants filled in the questionnaire. The average age was 55 (SD = 15), 64% of the sample was male. The average net income of the sample was 2700 Euros per month, which is similar to the average Dutch household income of 2783 Euros (Statline, 2010). About 16% of the respondents did not complete any education, or completed primary education or vocational secondary school, 46% had completed the highest level of secondary school or a vocational education and 37% finished university.

3.2. Measures

3.2.1. Environmental self-identity

The following three items were used to measure environmental self-identity: Acting environmentally friendly is an important part of who I am; I am the type of person who acts environmentally friendly; I see myself as an environmentally friendly person. These items were adapted from previous research (e.g. Fielding et al., 2008; Terry et al., 1999; Van der Werff et al., 2013a,b). Respondents rated each item on a seven point scale, ranging from *totally disagree* to *totally agree*. We computed the mean score on these items, Cronbach's alpha for this scale was .86 (M = 4.93, SD = 1.06).

3.2.2. Personal norm

Having an obligation-based intrinsic motivation means that one feels obligations to perform a certain behaviour (Lindenberg, 2001). Personal norm can be defined as 'the extent to which one feels morally obliged to perform a certain action' (Schwartz, 1973), and thus reflects feelings of obligation to act in an environmentally-friendly manner. Therefore, we measured obligation-based intrinsic motivation via the personal norm. Personal norm was measured with three items: I feel morally obliged to act in an environmentally-friendly manner; I would feel guilty if I did not act in an environmentally-friendly manner; I would be a better person if I would act in an environmentally-friendly manner. Respondents rated each item on a seven point scale, ranging from *totally disagree* to *totally agree*. We computed the mean score, Cronbach's alpha was .62 (M = 4.59, SD = 1.09).

3.2.3. Intention to use green energy

Respondents indicated how likely it is that their household will use green energy in the next year, on a seven point scale ranging from *very unlikely* to *very likely* (M = 4.93, SD = 1.91). We explained to the participants that green energy means that it is generated from renewable sources, such as sun or wind, and that it emits few CO_2 emissions.

3.3. Results

Hypothesis 1 was supported: environmental self-identity explained 45.2% of the variance in the personal norm ($F(1, 136)$ = 112.10, $p < .001$). The stronger the environmental self-identity, the stronger the personal norm ($\beta = .67$, $p < .001$). See Table 1 for the correlations between the key variables in our research.

Next, we found that personal norm mediated the relationship between environmental self-identity and intention to use green energy. The indirect effect from the bootstrap analysis was positive and significant ($a \times b = .31$), with the 95% confidence interval ranging from .036 to .564. In the indirect path a unit increase in environmental self-identity increases personal norm by $a = .69$. Holding environmental self-identity constant a one unit increase in personal norm increases intention to use green energy by $b = .45$. The direct effect ($c = .54$) is also significant ($p < .01$). Holding personal norm constant, a unit increase in environmental self-identity increases intention by .54. Since $a \times b \times c$ (.17) is positive it is complementary mediation (Zhao et al., 2010). This means that our model is supported, but that there may be other mediators as well.

3.4. Discussion

In Study 1 we tested and found support for the full model. The results suggest that environmental self-identity influences the personal norm (supporting Hypothesis 1), while personal norm predicted the intention to use green energy. Our second hypothesis that feelings of moral obligation (personal norm) mediated the relationship between environmental self-identity and environmental intentions was supported as well. This study is a first indication that environmental self-identity is related to environmental intentions via a moral route. To test the validity and reliability of our findings it is important to replicate our results with different variables (McCrae et al., 1996; Koole and Lakens, 2012). Can we replicate these findings with different indicators of personal norm and with a different dependent variable? We tested this in Study 2.

4. Study 2

Study 2 aimed to replicate the findings of Study 1 with two measures of personal norm: a general personal norm to act pro-environmentally and a specific personal norm to engage in a particular pro-environmental action (in this case the personal norm to buy sustainable products). Also, we included a different dependent variable, namely preferences for sustainable products.

Table 1
Correlations between environmental self-identity, personal norm and intention to use green energy.

	Environmental self-identity	Personal norm
Personal norm	.67*	
Intention to use green energy	.47*	.46*

* $p < .001$.

We first tested if environmental self-identity is related to a general and to a specific personal norm (Hypothesis 1). Second, we tested if both types of personal norms mediate the relationship between environmental self-identity and the intention to buy sustainable products (Hypothesis 2).

4.1. Method

4.1.1. Participants and procedure

Data were collected via an online questionnaire among students. In total 45 participants filled in the questionnaire, of which 34 were women; 3 people did not indicate their gender. The average age was 22.6 (SD = 3.71).

4.2. Measures

4.2.1. Environmental self-identity

The same items as in Study 1 were used to measure environmental self-identity. The items formed a reliable scale (α = .77, M = 5.89, SD = .87).

4.2.2. General personal norm

We measured general personal norm in a similar way as in Study 1. The two items focused on acting environmentally-friendly in general: I feel morally obliged to act in an environmentally-friendly manner; I would feel guilty if I would not act in an environmentally-friendly manner. We computed the mean score: the items formed a reliable scale (α = .70, M = 5.78, SD = 1.08).

4.2.3. Specific personal norm

The specific personal norm focused on the dependent variable in our study, namely buying sustainable products. Two items were used to measure specific personal norm: I feel morally obliged to buy sustainable products; I would feel guilty if I would buy non-sustainable products. The mean score was computed, Cronbach's alpha of this scale was .75 (M = 5.59, SD = 1.16).

4.2.4. Product preferences

Respondents were asked to indicate their preference for one out of two options of a product (see Van der Werff et al., 2013a). One option of the product was a sustainable choice, which was 20% more expensive than the other, unsustainable, option. In total eight choices were offered. Respondents indicated for a pair of jeans, orange juice, a laptop, a pen, a writing pad, a bicycle, a pair of socks and a mobile phone if they would prefer the sustainable or the unsustainable option. For example, participants chose between a pair of socks of 3 Euros which was produced in an unsustainable way and a pair of socks of 3.60 Euros which was produced sustainably. We counted the number of times respondents preferred the sustainable option (M = 6.12, SD = 1.76).

4.3. Results

Environmental self-identity explained 52.9% of the variance in the general personal norm to act pro-environmentally ($F(1, 42) = 47.10$, $p < .001$). The stronger the environmental self-identity, the stronger the general personal norm ($\beta = .73$, $p < .001$). Environmental self-identity also predicted the specific personal norm ($R^2 = .27$; $F(1, 42) = 15.38$, $p < .001$). The stronger the environmental self-identity, the stronger the personal norm to buy sustainable products ($\beta = .52$, $p < .001$). See Table 2 for all correlations.

Second, we tested if the general personal norm mediates the relationship between environmental self-identity and product preference. The mean indirect effect from the bootstrap analysis is positive and significant ($a \times b = .73$), with the 95% confidence interval ranging from .258 to 1.334. In the indirect path a unit increase in environmental self-identity increases personal norm by a = .89. Holding environmental self-identity constant, a unit increase in personal norm increases product preference by b = .82. The direct effect (c = .66) is also significant (p = .03), therefore it is complementary mediation. The results thus support our model, however, there may be other mediators as well.

Table 2
Correlations between environmental self-identity, general personal norm, specific personal norm and product preferences.

	Environmental self-identity	General personal norm	Specific personal norm
General personal norm	.73***		
Specific personal norm	.52***	.79***	
Product preferences	.33*	.50**	.53***

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

Next, we tested whether the specific personal norm mediated the relationship between environmental self-identity and product preference. The mean indirect effect from the bootstrap analysis is positive and significant ($a \times b = .48$), with the 95% confidence interval ranging from .177 to 1.044. In the indirect path a unit increase in environmental self-identity increases personal norm by a = .67. Holding environmental self-identity constant, a unit increase in personal norm increases product preference by b = .71. The direct effect (c = .66) is also significant (p = .03), therefore it is complementary mediation. The results thus support our model, however, there may be other mediators as well.

4.4. Discussion

In Study 2 we found that environmental self-identity was related to a general personal norm to act pro-environmentally as well as to a specific personal norm to purchase sustainable products. These results suggest that people with a strong environmental self-identity do not only feel more morally obliged to act in an environmentally-friendly manner in general, but also feel a stronger moral obligation to perform specific pro-environmental behaviours. Furthermore, as expected, both types of personal norm mediated the relationship between environmental self-identity and product preference. This suggests that environmental self-identity indeed promotes pro-environmental actions, because people with a strong environmental self-identity feel morally obliged to perform environmentally-friendly actions. However, in Study 1 and 2 we used correlational designs, making it difficult to draw any definite conclusions on causality. Therefore we will use an experimental design in Study 3.

5. Study 3

In Study 3 we used an experimental design. We manipulated environmental self-identity and tested if our manipulation influenced a general personal norm (Hypothesis 1). Second, we tested if personal norm mediated the relationship between the manipulation of environmental self-identity and pro-environmental intentions, in this case: product preference (Hypothesis 2).

5.1. Method

5.1.1. Participants and procedure

Respondents were undergraduates at a Dutch university. In total 75 respondents participated in the study, 5 participants were excluded from the dataset because they did not answer all questions or gave the same answer to all questions, leaving 70 participants in the final dataset. Age ranged from 19 to 34

Table 3
Means and standard deviations of the frequency of common and uncommon pro-environmental behaviours.

Common behaviour	*M*	SD	Uncommon behaviour	*M*	SD
I separate paper from my waste	6.00	1.49	I often buy organic products	3.24	1.67
I bring glass bottles to the recycling bin	6.32	1.16	I shower very shortly	3.27	1.63
I do not throw litter on the street	6.08	1.55	I buy glass bottles instead of plastic bottles	3.03	1.81
I turn off electrical appliances (to save energy)	5.68	1.42	I am a member of an environmental organization	2.43	1.97
I often go to work or studies by bike instead of by car	4.86	2.45	I always actively search for the most environmentally-friendly products	2.89	1.43
I turn off the heater when I leave my room	5.32	1.47	I refuse plastic bags in clothing shops	4.05	2.11
I use energy-efficient light bulbs	5.33	1.39	I rarely eat meat	4.22	2.18
I turn off the lights when no one is in the room	6.31	.71	I always separate all my waste (chemical, plastics, organic)	4.22	1.83

Note: Answers were given on a scale from 1 (never) to 7 (always).

($M = 22.2$, SD = 2.79); 46 women participated in the study and 23 men, one person did not indicate his or her gender.

5.2. Materials

5.2.1. Manipulation

We manipulated environmental self-identity by reminding people of their past environmental behaviour. According to self-perception theory (Bem, 1972) 'people come to know their own internal states by inferring them from observations of their own overt behaviour'. This suggests that past environmental actions can influence how people see themselves. Indeed, research has shown that reminding people of their past pro-environmental actions influences environmental self-identity and subsequent environmental actions (see Van der Werff et al., 2013b; see also Cornelissen et al., 2008). The manipulation involved that participants completed questions on how frequently they engage in eight behaviours. We pretested how common several environmental behaviours are in a Dutch sample. We conducted the pretest before the main part of the study and with different participants. In total 37 participants indicated on a scale from 1 (hardly ever) to 7 (very often) how often they perform 20 environmental behaviours. We selected the eight most common pro-environmental behaviours and the eight least common pro-environmental behaviours (see Table 3). One third of the participants indicated how often they performed the eight common pro-environmental behaviours; as most people perform these behaviours often this is the 'environmentally-friendly group'. One third of the participants indicated how often they performed the uncommon pro-environmental behaviours; because most people rarely perform these behaviours this is the 'environmentally-unfriendly group'. Finally, one third of the participants indicated how often they perform behaviours that are not related to the environment (e.g., 'read the newspaper'); this is our control condition. Participants were randomly assigned to one of the three conditions. In all conditions, answers were given on a scale ranging from 1 (totally disagree) to 7 (totally agree).

5.3. Measures

5.3.1. Environmental self-identity

The same items as in Study 1 and 2 were used to measure environmental self-identity, which served as a manipulation check. We computed the mean score, the items formed a reliable scale ($\alpha = .92$, $M = 3.98$, SD = 1.38).

5.3.2. Personal norm

Three items were used to measure personal norm: I feel morally obliged to act in an environmentally-friendly manner; I would feel guilty if I would not act in an environmentally-friendly manner; Acting environmentally-friendly would give me a good feeling. The items were transformed into a mean score, Cronbach's alpha was .88 ($M = 4.71$, SD = 1.42).

5.3.3. Product preference

Product preference was measured in a similar way as in Study 2. However, this time the sustainable choice was 10% more expensive than the unsustainable option. On average participants preferred 4.06 sustainable products (SD = 2.33).

5.4. Results

All variables were positively related (see Table 4 for an overview of all correlations). Our manipulation was successful, as it had an effect on environmental self-identity ($F(2, 66) = 5.13$, $p < .01$ $\eta_p^2 = .13$). *T*-tests revealed that participants in the environmentally-friendly group ($M = 4.68$, SD = 1.21) had a significantly stronger environmental self-identity than the control group ($M = 3.74$, SD = 1.18; $t(44) = -2.67$, $p = .01$, $d = .79$) and the environmentally-unfriendly group ($M = 3.52$, SD = 1.50; $t(44) = -2.89$, $p < .01$, $d = .85$). The environmentally-unfriendly and control group did not significantly differ in their environmental self-identity ($t(44) = .55$, $p = .59$).

Our manipulation influenced the personal norm ($F(2,67) = 5.65$, $p < .01$, $\eta_p^2 = .14$) as well. *T*-tests revealed that participants in the environmentally-friendly group ($M = 5.38$, SD = 1.29) had a stronger personal norm to act pro-environmentally than the environmentally-unfriendly group ($M = 4.07$, SD = 1.50; $t(45) = -3.20$, $p < .01$, $d = .94$), and a marginally significant stronger personal norm than the control group ($M = 4.71$, SD = 1.18; $t(44) = -1.83$, $p = .08$, $d = .54$). We found no significant difference in personal norm between the environmentally-unfriendly group and the control group ($t(45) = 1.62$, $p = .11$).

The manipulation of past behaviour did not significantly influence product preference ($F(2,67) = .64$, $p = .53$). However, the relationship between the independent variable and the dependent variable do not have to be significant in order to test mediation effects (James et al., 2006; Shrout and Bolger, 2002). Other possible mediators between the independent and the dependent variable may result in a non-significant relationship between the independent variable and the dependent variable. We conducted mediation analysis for multicategorical independent variables to test if the relationship between the manipulation of environmental self-identity and product preference was mediated by the personal norm (Hayes and Preacher, 2013). Dummy coding was used in which we compared the environmentally-friendly group with the control group and with the environmentally-unfriendly group, as the ANOVA showed that these group differ

Table 4
Correlations between environmental self-identity, personal norm and product preferences.

	Environmental self-identity	Personal norm
Personal norm	.81**	
Product preferences	.34*	.45**

* $p < .01$.
** $p < .001$.

significantly in the strength of personal norm. We first conducted the analysis comparing the environmentally-friendly group with the control group. The mean indirect effect from the bootstrap analysis is negative and significant ($a \times b = -.54$), with the 95% confidence interval ranging from −1.206 to −.019. In the indirect path a unit increase in the dummy variable (comparing the environmentally-friendly group with the control group) decreases personal norm by .67 ($a = -.67$). Holding environmental self-identity constant, a unit increase in personal norm increases product preference by $b = .81$. The direct effect ($c = .89$) is not significant ($p = .16$). Therefore we found competitive mediation (Zhoa et al., 2010). The results thus support our model, however, there may be other mediators as well. Next we compared the environmentally-friendly group with the environmentally-unfriendly group. The mean indirect effect from the bootstrap analysis is negative and significant ($a \times b = -1.06$), with the 95% confidence interval ranging from −1.989 to −.453. In the indirect path a unit increase in the dummy variable (comparing the environmentally-friendly group with the environmentally-unfriendly) decreases personal norm by 1.31 ($a = -1.31$). Holding environmental self-identity constant, a unit increase in personal norm increases product preference by $b = .81$. The direct effect ($c = .64$) is not significant ($p = .34$). Therefore we again found competitive mediation (Zhoa et al., 2010). The results thus support our model, however, there may be other mediators as well.

5.5. Discussion

In Study 3 we found support for our hypotheses in an experimental design. Our manipulation of environmental self-identity was successful. Participants in the environmentally-friendly group had a stronger environmental self-identity than participants in the environmentally-unfriendly group and the control group. There was no significant difference in environmental self-identity between the environmentally-unfriendly group and the control group. This suggests that it may be easier to strengthen people's environmental self-identity than to weaken it. Also, it suggests that the control group was more similar to the environmentally-unfriendly group, i.e. they see themselves as not very environmentally-friendly. In line with our hypothesis, the manipulation of environmental self-identity also influenced the strength of personal norm: the environmentally-friendly group felt more strongly morally obliged to act in an environmentally-friendly manner than the environmentally-unfriendly group, and slightly stronger than the control group. Again, we found no significant difference in personal norms between the environmentally-unfriendly group and the control group. Finally, we found support for our hypothesis that personal norm mediated the relationship between environmental self-identity and pro-environmental preferences, in this case product preference. The results are in line with our hypotheses that environmental self-identity influences environmental actions via a moral route.

6. General discussion

Research showed that environmental self-identity is an important predictor of pro-environmental behaviour (e.g., Gatersleben et al., 2012; Whitmarsh and O'Neill, 2010; Van der Werff et al., 2013a,b), and that people with a strong environmental self-identity are likely to act in an environmentally-friendly manner, even when there are no external incentives to do so. Does this imply that environmental self-identity strengthens one's intrinsic motivation to act pro-environmentally, which in turn affects pro-environmental actions? Thus far, little was known about how environmental self-identity affects environmental behaviour. The aim of the current research was to study via which process environmental self-identity is related to pro-environmental actions, and more specifically, to test whether intrinsic motivation is an important factor in this process. We proposed that people with a strong environmental self-identity are likely to act in an environmentally-friendly manner because they are intrinsically motivated to do so. More specifically, we hypothesized that environmental self-identity strengthens one's obligation-based intrinsic motivation (which we operationalized as personal norm, as explained above) to act in an environmentally-friendly manner, which in turn affects subsequent pro-environmental choices. As pro-environmental behaviours are generally not enjoyable, but often associated with less pleasure, we assumed that environmental self-identity will be related to one's obligation-based intrinsic motivation and thus influences pro-environmental actions via a moral rather than a hedonic route. Hence, we hypothesized that environmental self-identity is related to feelings of moral obligation to act in an environmentally-friendly manner, and these feelings of moral obligation mediate the relationship between environmental self-identity and environmental actions.

We conducted three studies to test our hypotheses, following correlational as well as experimental designs, and including different types of personal norms and different types of intentions and preferences in the studies. In all three studies we found that a stronger environmental self-identity was indeed related to stronger feelings of moral obligation to act in an environmentally-friendly manner. We did not only find this in the correlational studies, but also in Study 3 in which we manipulated environmental self-identity and found that when environmental self-identity was strengthened, people felt a stronger moral obligation to act in line with their identity than when the environmental self-identity was weakened. Interestingly, we did not find a difference in environmental self-identity and the strength of feelings of moral obligation between the control group and the environmentally-unfriendly group. This suggests that it may be easier to strengthen environmental self-identity than to weaken environmental self-identity. This is a promising finding from a practical point of view, as practitioners are most likely particularly interested in strengthening environmental self-identity as to encourage pro-environmental actions. In Study 2 we found that a strong environmental self-identity coincides with a general moral obligation to act in an environmentally-friendly manner, but also with feelings of moral obligation to perform specific environmental behaviours. This suggests that a strong environmental self-identity not only strengthens general feelings of moral obligation to act pro-environmentally, but also personal norms to engage in specific pro-environmental actions.

If environmental self-identity affects pro-environmental behaviour via a moral route, the relationship between environmental self-identity and pro-environmental intentions should be mediated by personal norms. We found that this was indeed the case in all three studies that included different indicators of personal norm and different indicators of environmental behaviour. Importantly, we did not only find this in the correlational studies, but also in the experimental study, suggesting that environmental self-identity indeed influences environmental intentions via intrinsic motivation. We studied the relationship between environmental self-identity, personal norm and the intention to use green energy and preferences for sustainable products, future research is needed to test if our findings hold when using other indicators of behaviour, for example household energy consumption or car use. In Study 1 we tested our model in a general sample of the Dutch population, in Study 2 and 3 we focused on student samples. Future research is needed to test if the relationships are similar in other samples as well.

Our results suggest that environmental self-identity may promote pro-environmental behaviour because it is related to one's obligation-based intrinsic motivation, people may thus

believe it is the right thing to do. These results align with the research by Stets and Carter (2012) that showed that people with a strong moral identity feel guilty when they do not act moral. However, in their study they found that people feel guilty *after* they did not act in line with their identity, while we proposed that people may anticipate these feelings and thus may be motivated by these anticipated feelings to act in line with their identity. Our studies indeed suggest that people with a strong environmental self-identity are motivated to act in an environmentally-friendly manner because they anticipate feeling guilty. This is in line with findings from earlier research showing that people anticipate feeling good when they would act in an environmentally-friendly manner or feeling bad when they would not act in an environmentally-friendly manner (Bolderdijk et al., 2012; Carrus et al., 2008; Smith et al., 1994). Our results suggest that next to intrinsic motivation as described in self-determination theory (Ryan and Deci, 2002) there is another type of intrinsic motivation, namely obligation-based intrinsic motivation. Pro-environmental actions may thus not only be promoted by focussing on the enjoyment of certain behaviours, but may also be promoted by focussing on one's obligation to act pro-environmental.

In our research we found that people with a strong environmental self-identity act in an environmentally-friendly manner because they feel morally obliged to do so. This does not rule out the possibility that behaviour is also guided by enjoyment-based intrinsic motivation, at least in some cases. We did not test if environmental self-identity is related to enjoyment-based intrinsic motivation because we argued that this may be less relevant in the environmental domain. However, in some cases enjoyment-based intrinsic motivation may be relevant for pro-environmental behaviour. For example, someone may enjoy cycling home after a day of work instead of driving home by car. In such cases enjoyment-based intrinsic motivation may also be important. Future research is needed to test in which cases enjoyment-based intrinsic motivation is important for pro-environmental actions and in which cases obligation-based intrinsic motivation is more relevant. Also, future research is needed to test whether people with a strong environmental self-identity are more likely to have a stronger enjoyment-based intrinsic motivation to act in an environmentally-friendly manner, and thus enjoy acting pro-environmentally to a larger extent than people with a weak environmental self-identity.

Being intrinsically motivated to act in an environmentally-friendly manner suggests that people with a strong environmental self-identity will perform pro-environmental behaviours without external rewards. Currently, many policies aim to promote pro-environmental behaviour by stressing or changing the external incentives related to the behaviour, such as communicating how much money one can save by acting pro-environmentally, or by making such behaviour relatively cheaper. For example, various governments subsidize the use of renewable energy or energy-efficient appliances. Also, rules and regulations are installed as external incentives to influence behaviour. For example, the conventional light bulb is banned in the European Union in order to promote the use of energy-saving lighting. Our results suggest that changing the external incentives may not always be needed, and that policies could also try to strengthen environmental self-identity, thereby strengthening one's moral considerations to act pro-environmentally. This may in fact be a cost-effective way of promoting environmentally-friendly behaviour, because expensive external incentives to promote pro-environmental options (e.g., subsidies or implementing and enforcing rules and regulations) may no longer be necessary. In fact, providing external incentives for pro-environmental actions may even undermine the intrinsic motivation to act in an environmentally-friendly manner. Research on blood donation showed for example that an external (financial) reward made people less likely to donate blood because it undermined their intrinsic motivation to do so (Mellström and Johannesson, 2008). Also, external incentives may mainly have short-term effects, as long as the incentive is in place (Bolderdijk et al., 2011), whereas intrinsic motivation may have long term effects as people may continue to feel morally obliged to act pro-environmentally. Future research is needed to test if campaigns that focus on environmental self-identity that strengthen the obligation-based intrinsic motivation are effective in promoting a range of environmentally-friendly behaviour, in the short as well as in the long term. Campaigns could for example remind people of a range of pro-environmental actions they commonly engage in (e.g., recycling waste, turning off the lights when leaving a room), thereby highlighting that they already perform several pro-environmental actions which may strengthen their environmental self-identity. Also, future research is needed to test if external rewards may undermine the obligation-based intrinsic motivation to act in an environmentally-friendly manner.

In sum, we studied the process via which environmental self-identity influences environmental behaviour, and particularly examined the role of intrinsic motivation in this process. We found that environmental self-identity is related to an obligation-based intrinsic motivation, which in turn promotes pro-environmental actions. As expected, the relationship between environmental self-identity and environmental actions was mediated by the obligation-based intrinsic motivation. This suggests that environmental self-identity promotes environmentally-friendly actions via an intrinsic moral route.

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