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Towards an understanding of residents' pro-environmental behaviour

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Abstract

The aim of this research was to provide a clearer understanding of how personal domain factors relate to pro-environmental behaviour. This exploratory study used the New Ecological Paradigm (NEP) scale (Dunlap et al., 2000) and Stern's value orientation scale (Stern et al., 1995) to gauge values and attitudes and how they relate to the adoption of a range of sustainable household products and practices of Australian householders. The research confirms that holding a pro-environmental attitude as measured by the NEP score does not relate to adoption of sustainable behaviours. However, egoistic values can be related to the uptake of some high cost pro-environmental products. Further research should seek to provide a deeper understanding of the contextual reasons for adoption or non-adoptive of specific pro-environmental behaviours.

Introduction and literature review

The increasing concerns regarding environmental sustainability have encouraged growth in research on how pro-environmental values and attitudes relate to sustainable practices. Research from social marketing and environmental psychology has explored the ways that individuals' values and attitudes shape their pro-environmental behaviour and the ways these can be activated by targeted campaigns. These campaigns often stem from governments who seek to encourage individuals to behave in sustainable ways. In Australia, this has included public information campaigns (see LivingGreener.gov.au) and a range of rebate and free installation schemes to encourage product uptake. This study investigates the association between the values, attitudes and behaviours of a sample of residents of an Australian capital city and their uptake of the range of pro-environmental products and behaviours promoted by various government campaigns. It demonstrates that values other than those associated by pro-environmentalism, such as egoism, can be usefully linked to sustainable practices, which has implications for the development of pro-environmental social marketing campaigns.

Research from marketing and environmental psychology has suggested that the behaviour changes these campaigns aim to achieve are determined both by individual factors and the external environment. These have been termed personal and contextual domain factors, and their interplay can significantly complicate the success of interventions (Maio et al., 2007; Stern, 1999). Personal domain factors are those that motivate the individual, such as values, beliefs and norms, and are the key foci of this paper. Contextual domain factors are attributes, acquired capabilities, the immediate situation, and external constraints, such as education, income and government regulation. This study applies two of the most common personal domain scales, the New Ecological Paradigm (NEP) scale (Dunlap and Van Liere, 1978; Dunlap et al., 2000), and the values work of Stern and his colleagues (Stern, 2000; Stern et al., 1995) and explores their relationship to a range of pro-environmental behaviours.
One of the most recognised streams of research on pro-environmental personal domain factors is the New Ecological Paradigm (NEP) scale, developed by Dunlap and Van Liere (Dunlap and Van Liere, 1978; Dunlap et al., 2000). The NEP scale was designed to measure attitudes towards issues like the need to limit human population growth, the importance of maintaining the balance between nature and human development and a perceived shift away from anthropocentric, or human-centred perceptions of reality. This initial scale has since been offered in revised forms (e.g., Dunlap et al., 2000; Manoli et al., 2007), with the more recent 15 item scale now more commonly used (Dunlap, 2008; Hawcroft and Milfont, 2010). Stern’s work in contrast draws on the norm-activation model of altruism developed by Schwartz (1992), which suggests that altruistic behaviour becomes more probable when the individual is aware of harmful consequences to others and then ascribes responsibility to themselves for changing the negative condition. Stern and his colleagues proposed a broader integrative theoretical model of environmental concern, focusing on three value orientations; egoistic, social-altruistic and biospheric (Stern, 2000; Stern et al., 1995). Their research has suggested that all areas may shape an individual’s pro-environmental beliefs and behaviours in varying ways. Social-altruistic and biospheric value orientations are more closely aligned with pro-environmental beliefs and practices, because individuals evaluate behaviour decisions against the perceived costs or benefits to society broadly, or the biosphere as a whole. However pro-environmental behaviours have also been associated with an egoistic value orientation, when an individual determines it is in their personal interest to act in pro-environmental ways (De Groot and Steg, 2008).

The work of Stern, Dunlap and their colleagues has been integrated into much of the current research on the personal domain factors of pro-environmental behaviour (Dunlap, 2008; Lucas et al., 2008; Steg and Vlek, 2009). Broadly this research has focused on self-reports of existing practices or intentions, with the aim of informing policy by outlining the socio-demographics and value orientations of those currently engaging in pro-environmental behaviour (Lehman and Geller, 2004; Steg and Vlek, 2009). These previous findings suggest that in order to develop campaigns to increase adoption rates there is a need to test the association between adoption and personal domain factors as indicated by these recognised measurements. This research was planned with a similar intention, to understand how attitudes and values related to a range of pro-environmental behaviours currently promoted by Australian government campaigns.

**Methodology and analysis**

This research applied a quantitative methodology, surveying householders who had expressed an interest in finding out information on, or engaging in pro-environmental initiatives. It included questions on pro-environmental values, attitudes and behaviours, to explore the link between these personal domain factors and behaviour, as well as investigate the different ways that motivation and opportunity may influence action. The range of products included in the questionnaire reflected those offered through a City Council led sustainability scheme running in the region at the time, and more broadly reflected the Australian Federal Government’s focus on sustainability products. The included behaviours were also based on those targeted by the Federal Government through the ‘Living Greener’ campaign, as detailed online (www.livinggreener.gov.au).

The questionnaire utilised the NEP scale (Dunlap and Van Liere, 1978; Dunlap et al., 2000), and the values work of Stern and colleagues (Stern et al., 1993; Stern et al., 1995). All 15 items of the revised NEP scale were included (Dunlap et al., 2000), as a means of measuring the pro-
environmental attitudes of the sample. The twenty three items from Stern et al. (1995) included items from the altruistic (five items), egoistic (four items), traditional values (nine items), and openness to change (five items) values clusters. The five items that measured biospheric values were excluded to reduce the number of survey items overall. This exclusion was deemed acceptable at the time because these item questions could be assumed to be measured within the NEP scale. It also allowed us to include questions on traditional values and openness to change, which were of interest as there were a range ethnicity within the population. However, as will be discussed in the results, this exclusion limited the range of analysis we were subsequently able to perform. Both scales were measured using a five point Likert scale.

Respondents were also asked about sustainability products and pro-environmental activities, based on the current Government campaigns as discussed above. The first six questions focused on the products and technologies respondents had in their home. These ranged in size and expense from solar panels to energy saving light bulbs. Respondents were asked if they had the product installed, and if not, to indicate a reason (cost, time, knowledge, available space, tenure restrictions or other). The second set of questions recorded the adoption of pro-environmental behaviours that required ongoing commitment, rather than one-off installations as per above. This included recycling, limiting energy use, composting and saving greywater. Respondents were asked to indicate how often they engaged in such behaviours (often, sometimes and rarely), and if not, why (cost, time, knowledge, available space, tenure restrictions or other).

The questionnaire was created through an online service (Survey Monkey) and two methods of distribution were used. The first via the website associated with the Council’s sustainability program which was accessed by residents to receive information about offers and financial assistance. The second distribution method was within an email newsletter on environmental measures sent to City Council subscribers. These distribution methods generated 575 responses, with 77% of those from the website. Data cleaning removed 44% of responses resulting in a sample of 324 responses.

The analysis discussed here comprised of cross tabulations between attitudes, values and behaviours. To achieve this, the values data were summed to generate overall scores. All NEP items were combined to form one score, whilst the value items were clustered as per Stern et al. (1995). These where then organised into low, medium and high groups, according to the mean and standard deviation of the each score, as detailed in Table One. The data on behaviours was simplified by categorising all answers that indicated respondents either had installed a product, or engaged in an activity in some manner as yes, and the remainder as no. The single value and attitude scores where then cross tabulated with the data on behaviours, as illustrated in Table Two. Pearson’s Chi squares were estimated on the summed value scores to determine their statistical significance, as detailed in Table Three.

Results and conclusions

The returned sample showed itself to have generally high pro-environmental attitudes, as illustrated by a median NEP score of 59, within a possible range of 16 to 75 (Table One). Respondents also reported high levels of uptake (90% or above) for products that had low barriers, such as retrofitting water efficient shower heads and tap fittings, ceiling insulation and energy saving light bulbs. All of these had been offered free or with significant rebates through government schemes. Similarly the well-established pro-environmental behaviour of recycling glass, plastic and paper showed engagement of over 99%. There were also high levels of
engagement (over 90%) in the reuse of shopping bags, and the reduction of energy use for standby power, heating and cooling, although the data does suggest that some of this is at a low frequency. These findings are generally positive for agencies aiming to encourage sustainable behaviour, as well as indicating some levels of uptake where frequency of behaviour could be increased.
Table One: Values categorisation information

<table>
<thead>
<tr>
<th></th>
<th>Median</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Low Range</th>
<th>%</th>
<th>Medium Range</th>
<th>%</th>
<th>High Range</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEP</td>
<td>59</td>
<td>58.25</td>
<td>9.184</td>
<td>16-53</td>
<td>30.5</td>
<td>54-62</td>
<td>33.6</td>
<td>63-75</td>
<td>35.8</td>
</tr>
<tr>
<td>Altruistic</td>
<td>21</td>
<td>20.79</td>
<td>3.516</td>
<td>5-19</td>
<td>25.7</td>
<td>20-22</td>
<td>37.9</td>
<td>23-25</td>
<td>36.3</td>
</tr>
<tr>
<td>Egoistic</td>
<td>12</td>
<td>12.10</td>
<td>2.680</td>
<td>4-10</td>
<td>27.1</td>
<td>11-13</td>
<td>41.3</td>
<td>14-20</td>
<td>31.6</td>
</tr>
</tbody>
</table>

Table Two: Engagement in pro-environmental behaviour according to attitude and value scales

<table>
<thead>
<tr>
<th>Product or Activity</th>
<th>All resp's %</th>
<th>NEP %</th>
<th>Altruistic %</th>
<th>Egoistic %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainwater tank</td>
<td>Yes</td>
<td>39.8</td>
<td>41.2</td>
<td>36.2</td>
</tr>
<tr>
<td>Solar hot water system</td>
<td>No</td>
<td>60.2</td>
<td>58.8</td>
<td>63.8</td>
</tr>
<tr>
<td>Solar panels</td>
<td>Yes</td>
<td>12.3</td>
<td>14.7</td>
<td>8.7</td>
</tr>
<tr>
<td>Recycle grey water</td>
<td>No</td>
<td>87.7</td>
<td>85.3</td>
<td>91.3</td>
</tr>
<tr>
<td>Compost</td>
<td>Yes</td>
<td>67.4</td>
<td>63.9</td>
<td>67.0</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>32.6</td>
<td>36.1</td>
<td>33.0</td>
</tr>
</tbody>
</table>

Table Three: Pearson’s Chi Squares

<table>
<thead>
<tr>
<th>Product or Activity</th>
<th>Value</th>
<th>Chi square significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solar hot water system</td>
<td>Egoistic</td>
<td>0.010</td>
</tr>
<tr>
<td>Solar panels</td>
<td>Altruistic</td>
<td>0.041</td>
</tr>
<tr>
<td>Compost</td>
<td>Egoistic</td>
<td>0.015</td>
</tr>
</tbody>
</table>

This paper focuses on the activities or products with lower levels of uptake, and considers their relation to the NEP score, and the altruistic and egoistic value orientations. These were generally those that required greater motivation or financial investment; the uptake of rainwater tanks, solar hot water systems, solar panels, as well as engagement in greywater recycling and composting (Table Two).

Comparing the attitude and value orientations with the measured behaviours illustrates that NEP scores do not show a clear association with pro-environmental behaviours. There are no clear patterns of change as scores move from low to high, nor where any associations shown to be significant through Pearson’s Chi square. This suggests that NEP as a measure of attitudes is not a reliable predictor of pro-environmental behaviour and that it’s dominance of pro-environmental research should be reconsidered. It also meant that the exclusion of Stern’s biospheric items from the survey instrument left the analysis without a clear measure of value.
that focuses on benefit to the natural environment. This limitation becomes apparent when the associations between socio-altruistic values and behaviours are considered. This value orientation refers to holding a people-focused altruism, and in this context implies that individuals would be engaging in pro-environmental behaviours because they believed it will benefit humankind. Likewise, the patterns of uptake are unclear and showed no consistent change in behaviour according to the strength of the value held. Further, only solar panel installation was shown to be significant, however as will be discussed below, this finding is difficult to interpret.

The clearest changes in pro-environmental behaviour according to strength of value can be seen in the egoistic value orientation. Across all of the behaviours focused on here, there is a consistent pattern of change in the likelihood of the behaviour as an egoistic orientation shifts from low to high. Those with a low egoistic orientation are more likely to compost, recycle grey water, and have solar panels installed. Whereas those with a higher egoistic orientation are more likely to have rainwater tank, or a solar hot water system. Of these associations, only composting and solar hot water systems are significant according to Chi square analysis (Table Three). That involved activities like composting and grey water recycling would be negatively associated with egoism is not surprising. It is also credible to associate higher cost, but ultimately financially beneficial measures, such as installing rainwater tanks and solar hot water systems, with a higher egoistic orientation. Further both of these items have been included in government led rebate systems that aimed to reduce initial costs and promoted long term environmental and financial benefits. This supports claims in the literature that egoistic value orientations can be associated with pro-environmental behaviours.

However solar panel installation, which has been promoted with similar financially orientated messages, does not follow the same rationale. Instead it is those with a low egoistic orientation that indicate the highest levels of installation. Somewhat counter intuitively, it is also those with a low or medium altruistic orientation that are more likely to have solar panels, a finding which was also significant to 0.041. It is worth noting that 29% of respondents stated ‘No, for other reasons’, higher than the 16.4% who said yes. This suggests that the barriers that prevent solar panel uptake are complicated. Some of these may stem from confusion regarding the benefits of installing solar panels in the current Australian regulatory environment. This includes changes to rebate systems, and inconsistencies in the feed in tariffs that pay those with panels for the spare electricity they generate. This suggests that solar panels are a special case within this high cost category that require further research, and highlights the importance of the consideration of contextual domain factors as part of this process.

This paper has provided an overview of the association between pro-environmental behaviours with low uptake and the values and attitudes of our research sample. This research has demonstrated that the commonly used NEP scale does not relate to pro-environmental behaviour in our sample, and instead Stern’s values scale may offer more useful guidance on the way pro-environmental behaviours can be activated through social marketing campaigns. Specifically, the findings suggest that egoistic value orientations need to be considered when promoting high cost or effort pro-environmental behaviours, and that communicating a financial benefit message may be a valid way to activate that. Furthermore, the findings suggest that those same pro-environmental behaviours are not reliably associated with an altruistic value orientation. This finding may be relevant to those public campaigns that focus on promoting sustainable behaviours so as to protect the planet for future generations, and suggests further research is required to clarify the influence of this altruistic message for specific behaviours.
References


