

Rationalising energy-related behaviour in the home: Insights from a value-laddering approach – Miranda Miroso, Daniel Gnoth, Rob Lawson, Janet Stephenson. European Council for an Energy Efficient Economy Summer Study, France, pp.2109-2119, June 2011.

Rationalizing energy-related behavior in the home: Insights from a value laddering approach

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Abstract

To obtain improved understanding of what guides energy efficient behavior, the Foundation for Research Science and Technology in New Zealand issued a call for research to understand underlying personal values and their role in shaping demand. In this context a particular need was identified to understand the ways in which different values may be linked to specific behaviors as they become expressed in everyday needs and choices that people make. The research described in this paper is part of the first stage of a three-year project called Energy Cultures which examines household use of electricity funded by the Foundation to address this research priority. While personal values have been associated with environmental behaviors in previous research, the findings have produced mixed and often weak relationships. The mechanisms showing how they are linked have received scant attention. Understanding the different paths through which a value might be associated with a particular behavior is important both to comprehend the role that values play in determining behavior generally and also in devising interventions for behavior change. In this paper we investigate the paths that link energy behaviors to peoples' rationalizations for those behaviors, to their personal values. 101 in-depth, qualitative interviews were conducted in four contrasting locations in New Zealand. In these interviews 21 household energy-saving behaviors were investigated using laddering methods which are designed to uncover underlying values in a structured way. The results show that the ladders are complex and reveal many different rationalizations arising from the behaviors which then have varied links to different values. Given the diversity of paths that exist, we conclude that

understanding people's rationalizations for behavior is just as relevant as understanding their values in seeking to identify appropriate policy interventions that target energy efficiency and conservation.

Introduction

As the International Energy Agency (IEA) described in 2009 much of the investment required to mitigate future climate change will be made by energy consumers, rather than suppliers. They concluded that;

“A huge step-change in the attitudes to energy efficiency and consumer purchases by hundreds of millions of people worldwide is needed. Governments, through information provision, sound regulation and targeted fiscal incentives, have a key role to play in ensuring that, worldwide, the right decisions are taken to safeguard the future of the energy sector – and of the planet” (IEA, 2009).

In New Zealand the Government has a target to increase efficiency and save 55PJ pa by 2015 (NZES/NZEECS 2010). To achieve this, a deeper understanding of consumer behavior and barriers to smart energy use is needed to further refine interventions which promote energy efficiency and conservation.

The research described in this paper is part of the first stage of a three-year project called Energy Cultures which examines household use of electricity (Stephenson et al., 2010). The Energy Cultures research project applies a novel combination of complementary social science methods to improve understanding of the drivers of household energy behaviors, and to deliver an effective strategy to achieve more energy-efficient behaviors. We hypothesize that within New Zealand there are clusters of households with identifiably different sets of values and behaviors relating to energy use (i.e. 'energy cultures'). Identifying the characteristics of, and influences on, different energy cultures will help to develop more effective interventions. The first stage of this research project has been to investigate the relationship between a wide range of personal values and a selection of energy-related behaviors in the home.

The focus of this paper is not on describing the most important values that influence specific energy behaviors. Rather our aim is to demonstrate the various paths that exist which link energy behaviors to personal values. In doing so, we shift the emphasis away from the terminal, or end values and towards peoples' more concrete and immediate rationalizations for doing, or not doing, specific energy-saving behaviors in the home. Identifying these links will help us to better understand the overall influence that values play in determining energy behaviors as well as help policy makers devise more relevant energy-saving campaigns and interventions. The paper starts with an overview of the existing literature on values generally, before summarizing the work conducted on values in the context of energy consumption. Following this is an overview of our study's methodology, then a results section which presents five value-to-behavior ladders which exemplify the main results of our study. The paper finishes with a discussion that outlines the implications of our research findings for policy makers and explains how this research fits into the next steps of the Energy Cultures research project.

Energy Consumption and Values

Popularized by Rokeach (1973; 1979) and extensively developed since by Schwartz (1992; 1994), psychological theories and studies on human values and their influence on behavior have become plentiful in recent years. The advantages of studying values are well documented and include the following: Values serve as guiding principles and therefore they can be used as predictors of behavioral intentions; they hold relatively stable overtime; and they are generalizable beyond specific situations and context due to their abstract nature. In 1983, Dunlap et al (1983) suggested that many of our contemporary environmental problems are in fact rooted in human values. Since then, a plethora of studies have emerged which look at the influence of values on a wide range of environmental behaviors. Many of these studies find that the significance of values as direct predictors of environmental behavior is limited and repeatedly reports large gaps between values and pro-environmental behaviors (c.f. Thøgersen & Grunert-Beckmann, 1997).

The research on values in the domain of energy (Karp, 1996; Labay & Kinnear, 1981; Neuman, 1986; Vringer, Aalbers, & Blok, 2007) reaches similar conclusions. While all bar

one of the above studies did report a significant relationship between values and energy behaviors, they all claimed that the relationships were weak. Furthermore, the various studies do not show consistent results. The findings from our own research on values and their influence on a range of specific energy-saving behaviors in the home (Miroso, Lawson and Gnoth, forthcoming) has likewise showed only limited success in linking personal values with energy-behaviors. For example, less than half of the specific behaviors that respondents were asked about in the interviews actually resulted in the identification of a core personal value. A key feature which can partly explain this was the simple and routine nature of many of the energy-saving behaviors (e.g. washing hands in cold water and cooling house down by opening windows). Many respondents clearly found it difficult to articulate beyond a simple explanation (e.g. because it's quicker or cheaper).

The weak links identified in previous research may arise for several reasons such as social desirability in responses (e.g. Kempton, Boster and Hartley 1996; Kolmuss and Agyeman 2002) and also because of intervening variables between values and behavior, as modeled in sustainability research by Barr & Gilg (2007). Vringer et al's (2007) study, which found no differences in the energy requirements of groups of households with different value patterns, concluded that the lack of relation between household energy requirement and values is in part due to the social dilemma caused by respondents thinking that not they, but others, should come up with solutions to energy problems. Gutman (1997, p. 556) claims that values "may represent the underlying reasons why we strive for the goals we do – but they are not the actual reasons why we do what we do".

Despite this, understanding people's values is still useful due to the advantages outlined earlier (e.g. they do tend to be stable over time and do exert some influence on behavior as people are usually unwilling to act in conflict with their values). Given the right set of circumstances, most people are likely to adjust their behavior to act more consistently with their values. So rather than simply dismissing values work altogether, it makes sense to try and understand what variables intervene between energy-related behaviors and a person's core values. To do this involves exploring the mechanisms showing how values may be linked to behaviors.

Methodology

The sample consisted of four case study areas within New Zealand which were chosen because of the contrasting socio-economic backgrounds and geospatial locations, housing types, and climates (see Figure 1). Participants in each location were chosen at random from the telephone directory – apart from four referrals which had been given by participants on the basis that they would be interested in the study. As the sample size increased, efforts were made to screen participants to ensure a wide spread of ages and incomes.

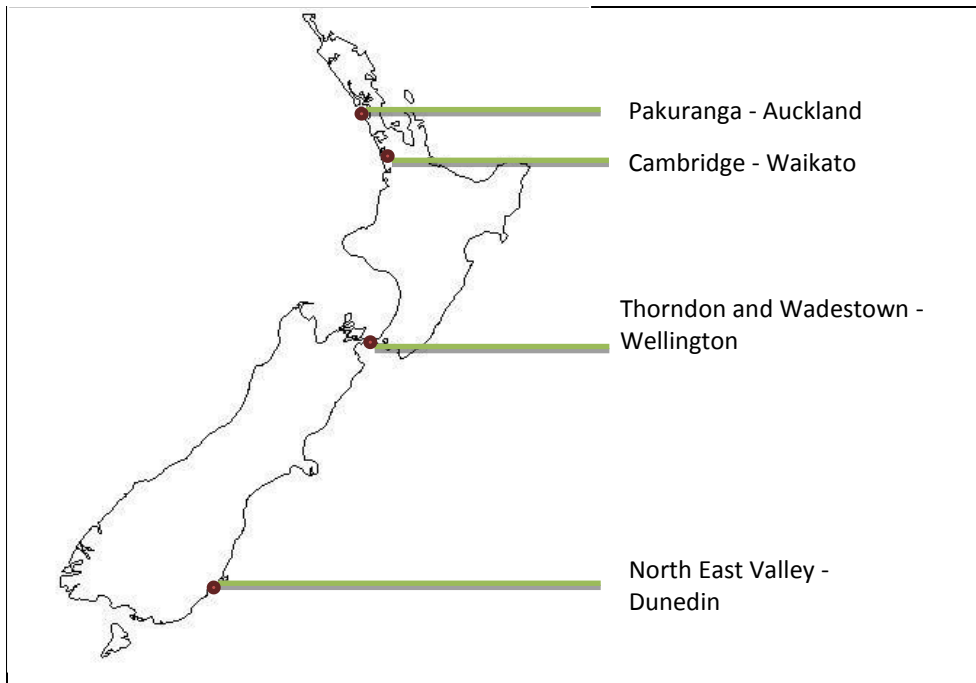


Figure 1: Case Study Areas in New Zealand

The interview structure followed a process known as ‘laddering’ or ‘means-end’ analysis developed by Reynolds and Gutman’s (2001). This is a semi-structured method where the interviewer probes respondents with a series of ‘why’ questions to ultimately try and identify the underpinning values which drives a particular behavior. Participants were asked a series of twelve questions about behaviors that could be undertaken to reduce energy consumption in the home and ten questions related to energy efficient investments (see Table 1 below). This list was derived and modified from the work of Bar and Gilg (2007) who’s work involved a more extensive analysis of activities that could support living a more sustainable lifestyle. Participants were asked to respond to each of the 21 questions using a five-point scale (with one end of the scale indicating that they always did the energy-saving behavior/ or they would almost certainly consider buying the energy efficient appliance, and the other end indicating that they never do the energy-saving behavior/ or would never consider buying the energy efficient appliance). After each response, the interviewer would probe the participant with questions such as; “why do you do that?” or “why is that important to you”? Ultimately, the aim of the questioning was to get respondents to think critically about what their motivations were for doing, or not doing, the energy-saving behaviors, thereby allowing the interviewers to identify the overarching drivers or barriers for the curtailment behaviors. Interviews lasted between 40 and 90 minutes depending on the length of answers provided. The interviewers continued to recruit respondents until additional interviews were no longer providing new information and it was clear we had achieved saturation in the range of values and rationalizations that were being identified. In total, 101 interviews across the four case study areas were conducted. Interviews were recorded using digital voice recorders and were then transcribed soon afterwards. Transcriptions were analyzed using a combination of three different coding techniques and organized using the software program NVIVO 7. Three coders were involved in the process of devising the coding schema and on-going consistency checks were made by the project leader to ensure inter-coder reliability. Codes were initially aligned according to Reynolds and Gutman’s (2001) framework, meaning that there were three levels of analysis – the behaviors, the rationalizations¹, and the values. For each of these three levels, a different analysis methodology was employed. For the behavioral responses, these had been recorded using the five-point scale which would then be used later to separate groups who were strongly for, or strongly opposed to, doing a particular behavior. Rationalization level responses (the immediate reasons that were identified for a doing or not doing a particular behavior) were analyzed according to Braun and Clarke’s (2006) thematic six-step content analysis approach. This involved an on-going dialogue between all coders as themes were developed, collapsed and extended. Value level

responses (the motivations or enduring beliefs underpinning the rationalizations) were analyzed using Schwartz and Bilsky's (1992) value inventory which has been extensively validated in academic literature.

Once the data had all been coded, two aggregate value-to-behavior ladders were then devised for each of the 21 questions. For each question, two sets of ladders were drawn (one ladder for the negative responses "never" and "unlikely to consider", and one ladder for positive responses "likely to consider" and "already do").

Results

Table 1 shows the participants' reported likelihood of considering the energy-efficient practices and investments discussed in the interviews. It shows the percentage of people who answered either negatively or positively for each of the questions based on the five-point scale. Mid-point responses are not shown.

Table 2 presents the main rationalizations of behaviors that were mentioned during the interviews (split into positive and negative rationalization categories) and the frequency with which these were mentioned. Broken down this way, the most commonly-used positive rationalization for energy behavior is economic efficiency, followed by environmental efficiency. Situational opportunities, convenience and comfort are also relatively common rationalizations. The most commonly-used negative rationalizations for energy behaviors are situational constraints and inconvenience. Routinized behavior and time inefficiency are also relatively commonly used. Among rationalizations of negative responses indicating non-compliance or non-interest in the behavior, inconvenience ranks well above discomfort. Of particular interest is the unexpectedly low frequency of 'financial constraint', suggesting that the inability to pay is not often the main constraint in these interviews. At the same time, economic efficiency is an important consideration for many.

Table 1, Summary of Energy-saving Behaviors and Investments

Energy-saving Behavior or Investment	% not interested or rarely done	% interested or frequently done
Doing dishes by hand	6.9	84.3
Cooling house by opening windows	6.9	84.3
Line drying of laundry	7.8	84.3
House insulation	7.8	79.4
Put on more clothing before turning up the heating	9.8	77.5
Installing energy efficient light bulbs	16.7	75.5
Wait for a full load before using washing machine	15.7	71.6
Reduce heating in unoccupied rooms	19.6	70.6
Keep household heating low to save energy	28.4	60.8
Installing an energy efficient refrigerator	18.6	58.8
Installing an energy efficient washing machine	21.6	54.9
Installing an energy-efficient heating system	31.4	54.9
Taking shorter showers	41.2	51
Insulation of heating pipes	21.6	50
Cooking on gas	40.2	49
Rinsing the dishes in cold water	34.3	46.1
Turning appliances off instead at the wall	30.4	39.2
Installing double glazing	36.3	38.2
Washing hands in cold water	19.6	34.3
Reducing hot water temperature	29.4	20.6
Buying a smaller refrigerator	78.4	13.7

Table 2, Frequency of Main Rationalization Identified by Laddering Process (Broken Down into Positive and Negative Rationalizations)

Rationalizations for doing an energy-saving behavior	Number of Times Coded	Rationalizations for not doing an energy-saving behavior	Number of Times Coded
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	Across all Interviews		Across all Interviews
Economically efficient	385	Situational constraint	150
Environmentally efficient	175	Not convenient	133
Situational opportunity	159	Not routine	124
Convenient	140	Not time efficient	80
Comfortable, pleasurable	121	Not economically efficient	70
Physical opportunity	65	Not comfortable, not pleasurable	66
Financial opportunity	60	Not hygienic	49
Technical opportunity	59	Technical constraint	49
Hygienic	44	Financial constraint	42
Time efficient	31	Not Safe	34

In Table 3 exemplar quotes are given to illustrate the meanings of the categories of rationalizations presented above and provide some examples of commonly stated phrases which expressed the themes. It

is important to note that many themes could be either prohibitory to, or able to stimulate, curtailment behaviors.

Table 3: Explanation of Main Rationalization Categories with Exemplar Quotes

Economic Efficiency	<p>“It’s a money thing, always analyzing the value you can get from what appliance before you have to get another one. I mean if some dramatic breakthrough that came through that I could look at and say well that is going to save me money over the next year even if I throw that one out then I would do that” (Fazer, Wellington).</p> <p>[Drying clothes in a dryer] “I don’t like the wastage of it you know, it’s just sort of money going out the window really” (Rowling, Wellington).</p>
Environmental Efficiency	<p>“Just aware of waste of energy, it is in the back of my mind... I’ll make sure if I go out of the room I’ll turn them [the lights] off... I’m just thinking of the future and just maintaining resources and things” (Finch, Wellington).</p> <p>[Energy-saving light bulbs] “They don’t do what they state” [in terms of energy efficiency] (Brown, Wellington).</p>
Situational Factors	<p>“Whenever I need to replace them I replace them with energy efficient light bulbs” (Bielsty, Wellington).</p> <p>“We have not swapped [light bulbs] here because we are renting and it was a short time rental, if we were renting here for longer I would have invested in them” (Jackells, Wellington).</p>
Convenience	<p>“It’s the effort, it’s just kind of inherently lazy, my appliances are always in awkward position like down on the bottom so it’s good to keep it out of the way but reaching around, behind the case every time to switch on the TV is such a hassle” (Lyons, Wellington).</p> <p>“The reason why I’m renovating the kitchen is to make it more convenient for me and a dishwasher would add to that convenience” (Cairns, Wellington).</p>
Comfort, pleasure	<p>“I have it [the heating] comfortable; I’m too old not to be comfortable” (Gray, Wellington).</p> <p>[Line drying laundry] “I do because I think that clothes are much fresher by line drying them. To me they have a totally different feeling. They are softer and just I prefer it” (Edwards, Cambridge).</p>
Physical Factors	<p>“I’m not able to do that here [line drying laundry] being in an apartment so everything has to be machine dried” (Cairns, Wellington).</p> <p>[Doing dishes by hand] “It’s good for my health; I’m in my 60s you know. Yeah, if I do the physical work, it’s good for me, machines are no good” (Hardy, Auckland).</p>
Financial Factors	<p>[Reduce heating to save energy] “We do because we are only on the sickness benefit and we don’t have enough money to pay for using the heater” (Poppins, Auckland).</p> <p>“I’m having the kitchen renovated so I’m putting the dishwasher in... it will increase the value of the property for a start, I mean, people expect dishwashers these days” (Cairns, Wellington).</p>
Technological Factors	<p>“I have a rule in the house, [for showering] less than 5 minutes... Our tank only holds a certain amount, I have couple of students living with me, so I have to have that rule” (Baaty, Wellington).</p> <p>“No [I wouldn’t reduce the hot water temperature], mine is a very old fashion one [cylinder], it doesn’t have anything on it, so no” (Baledoy, Wellington).</p>
Hygiene	<p>[Line drying laundry] “It’s hygienic [the] sunshine gets rid of all sorts of things” (Hall, Wellington).</p> <p>[Washing hands in cold water] “I don’t from a more from hygienic point of view, I believe that there’s more bugs killed with hot water than cold” (Croft, Wellington).</p>
Time Efficiency	<p>[Using clothes drier] “At least my clothes are going to be dry when I want them to be dry” (Jackells, Wellington).</p> <p>[Cooking on gas] “Gas is quicker; it doesn’t take as long to heat up” (Lyons, Wellington).</p>
Routine	<p>[Putting on a jersey before turning up the heating] “Is just something I have never really done” (Carter, Auckland).</p> <p>[Cooking with gas] “We are used to gas coming from the UK - we had gas over there so it’s just what we are used to” (Douglas, Auckland).</p>
Safety	<p>[Cooking on gas] “No, never. I am frightened of it. I had some very young friend a few years ago that were killed in a gas explosion on a boat” (Gruen, Auckland).</p> <p>[Turning appliances off at the wall] “Yes, always because I fear fire” (Wade, Cambridge).</p>

Five value-to-behavior ladders covering four separate energy-related behaviors ('put more clothing on before turning up the heating', 'keep household heating low to save energy', 'wait for a full load before using the washing machine', and 'buying a smaller refrigerator') are now presented in turn. While such ladders were constructed for all of the 21 energy-saving behaviors, these diagrams have been selected for discussion as they best represent the variety of different patterns shown in the ladders. Furthermore, they show how the barriers and incentives for partaking in energy-saving behavior differ greatly depending on the behavior. Figure 2, presents the first exemplary ladder which we will discuss. This ladder represents the results for the ten respondents (see Table 1) who said they 'never, or rarely' put on more clothing before turning up the heating'. It is a relatively simple ladder and thus is useful to demonstrate how to interpret the results. The titles on the left hand side of the diagrams (B, R and V) represent the three levels of the ladders (B=Behavior, R=Rationalization, V=Value). The thickness of the lines indicates the frequency with which the rationalizations or values were reported (see boxed key). The boxed table in the figure details the rationalizations which are mentioned in the interviews but are not shown in the visual ladders as they are mentioned fewer than three times. Rather than discard this information, it has been included as it provides an insight into the diverse range of responses given by respondents.

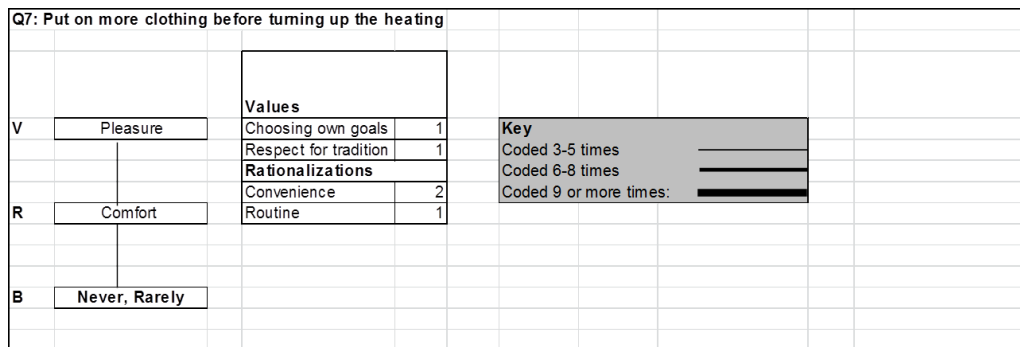


Figure 2: Aggregate ladder for negative responses to the question 'Do you put on more clothing before turning up the heating?'

In this ladder it is possible to see that for people who said they never or rarely put on more clothing before turning up the heating, the main reason was because they did not find it comfortable to do so. For example, a number of the respondents discussed feeling uncomfortable sitting inside wearing ski jackets and gloves. The following quote illustrates this: "I have to work at home to and I've got to be comfortable. I could put a jersey on but I like the luxury [that the central heating provides]. The mind-set has shifted... I'm from a family where you just put on a jersey and now I've got this luxury" (Finchⁱⁱ, Wellington). The box in the figure shows that 'convenience' was mentioned by two respondents as a reason for just turning up the heating (e.g. "sometimes I'm too lazy or occupied with something else, I'd rather not go up to my room and get something else to put on" Roberts, Wellington), and that 'routine' was mentioned by one respondent ("just something I have never really done" Cook, Auckland). The ladder shows a simple link from the rationalization 'comfort' to the more abstract value which underpins this 'pleasure' which some respondents were able to articulate in the interviews.

Different aggregate value-to-behavior ladders varied considerably in complexity depending on the particular behavior. While the above ladder was simple, the second exemplary ladder (Figure 3), which is for those respondents who said that they often or always keep the household heating low to save energy, shows multiple links and hence a much more complex story.

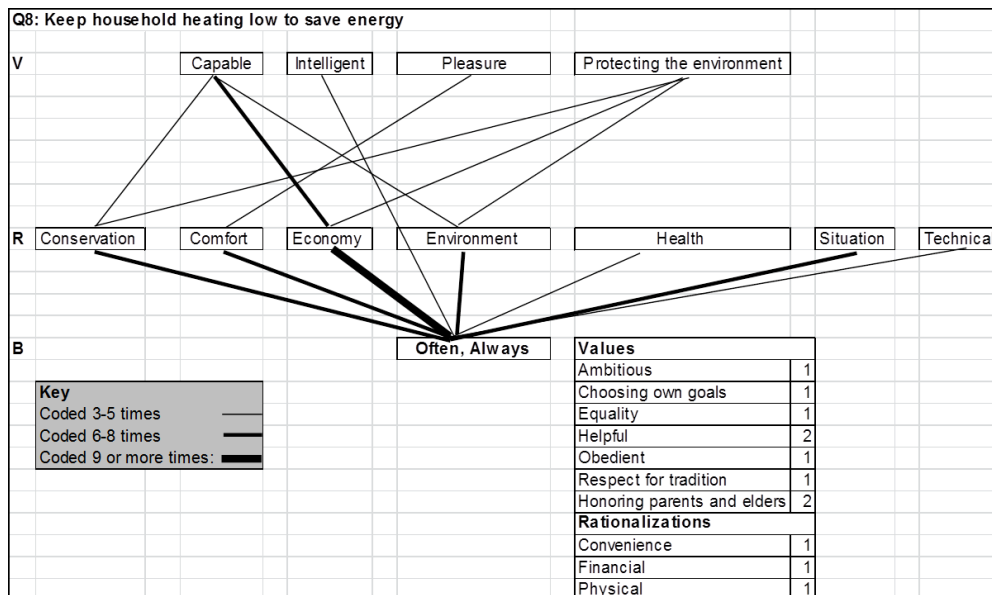


Figure 3: Aggregate ladder for positive responses to the question ‘Do you keep household heating low to save energy?’

There are seven main rationalizations given as to why people behave in this manner. The thicker line on the figure shows that the most common stated reason for keeping the heating low was to save money as the following respondent explains: “[I] always turn in down cause if you don’t with heat pumps you will spend a lot of money” (Eddie, Cambridge). The other most common reasons given fall into the categories ‘conservation’, ‘comfort’, ‘environment’ and ‘situational opportunities’. While the first three categories here are easily understood, the other latter requires an explanation. Thus, ‘situational opportunities’ in this case represented context specific factors, for example, one respondent reported that they had no need to heat the house – “we’ve got a dehumidifier that runs all the time and it keeps the place free of moisture, and so therefore we don’t see the need to heat in addition” (Falckon, Wellington).

What is really interesting about this ladder is that it is show the range of different pathways that the behavior-to-value chains can take. Firstly, it demonstrates the link between the behavior, to three different rationalizations (‘conservation’, ‘economy’ and ‘environment’), to just one value ‘protecting the environment’. This means that although some people are able to articulate a number of reasons as to why they behave in a number of ways, these reasons are all in fact ultimately driven by the same goal. The fact that people tend to only have a small number of values which drive most of their behavior is one of the main advantages of studying personal values to understand pro-environmental behaviors such as energy use. Understanding these values, and how they influence behavior, can be much easier than attempting to understand a whole raft of rationalizations. However, the picture is not always that simple. In fact, the second interesting pathway evident in the ladder is the link from the behavior, to one rationalization to multiple values. For example, ‘conservation’ is linked to two mutually exclusive values – ‘capable’ and ‘protecting the environment’. This clearly demonstrates that there can also be multiple deep-set motivations influencing a single behavior. Thirdly, the ladder also shows that in some instances, there is a direct link from behavior-to-value (in this case from the value ‘intelligent’ to ‘keeping heating low’). The fact that respondents were able to articulate this value without following the more typical process through the ladder (i.e. rationalizing their action before moving on to explain the more abstract value driving this response) is indicative of the more direct influence that this value exerts.

The third and fourth example ladders are presented in Figure 4 and 5 below. The former is the positive ladder and the latter the negative ladder for the question ‘Do you wait for a full load before using your washing machine?’

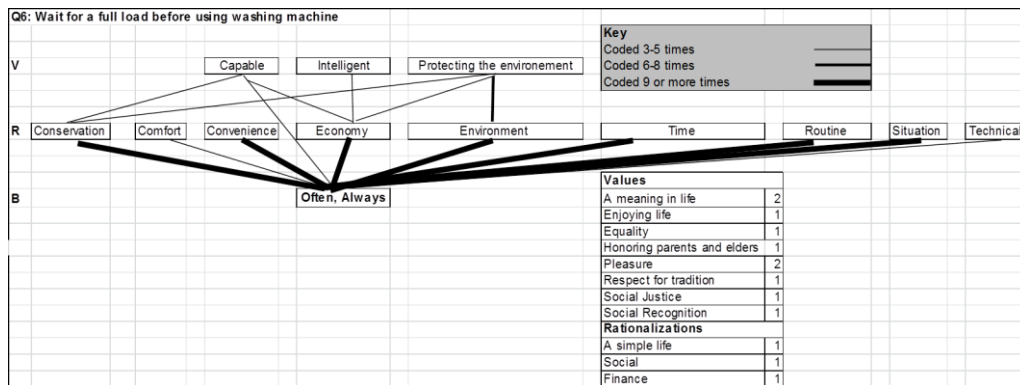


Figure 4: Aggregate ladder for positive responses to the question ‘Do you wait for a full load before using the washing machine?’

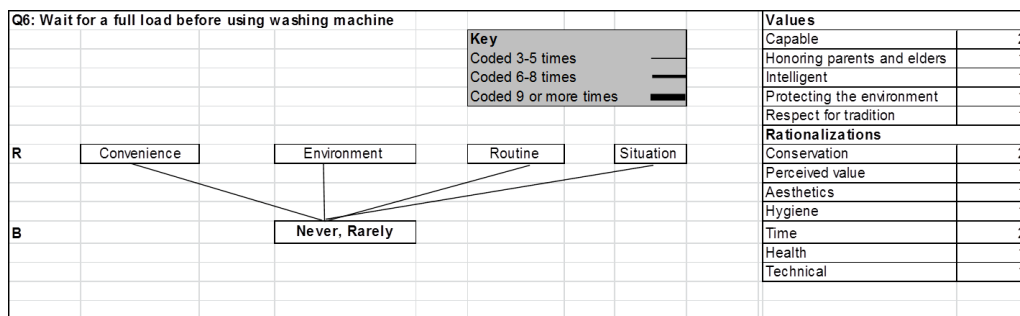


Figure 5: Aggregate ladder for negative responses to the question ‘Do you wait for a full load before using the washing machine?’

What is most remarkable about the positive ladder (Figure 4) is the large number of ways which people rationalize this behavior (nine main rationalization categories depicted pictorially and three other reasons shown in the adjoined table). Responses which fall into the ‘situational opportunities’ category are typified by responses such as “well I’ve got enough clothes to keep me going” (Jenkins, Wellington). Those classified in the technical category generally involved the size of the actual machine as the following respondent explains: “It is only a front load so it takes such a small load anyway” (Sabarsky, Wellington). The other categories are fairly straight forward, with the ‘convenience’ responses for example, being along the lines of the following quote: “I wash on Wednesdays, it’s easier to do a full load otherwise you are mucking around doing the same job more often” (Harold, Auckland). As well as illustrating the broad spectrum of responses for a simple energy-saving behavior such as this, the thickness of the lines on above ladder show that the links between the behavior and the rationalizations are much stronger than the links to the underpinning values.

Figure 5 illustrates a ladder where no particular values were repeated frequently enough to be drawn in the figure. While most respondents clearly found it difficult to articulate beyond a simple rationalization for denying this behavior, the six that were able reflected five different values. This pattern was frequently the case with regards to many of the other non-efficient behaviors. In the ladder, it is again perhaps the ‘situation’ rationalization category which consists of some of the most interesting explanations for this behavior. For example, responses here included justifications such as “whenever is a sunny day, which is quite rare I just need to get it done, I quickly flick it through” (Lyons, Wellington), and “I think, it makes it easier if you do half a load rather than having a big load because I have to share the line with six others you see, there are 6 flats here, so I don’t want to have too much or I’ll take up too much room. So I find if I do a medium load rather than keeping it for one big one well then it’s easier” (Johnson, Wellington). The ‘environmental’ category is also worth explaining. This rationalization was mentioned by a number of respondents, who were alluding to the fact that they believed that doing their washing on a more frequent basis was not making any difference to the environment as they were able to set their machine to wash a half load. The routine responses were directly related to habit – “I wash every second day

as a rule” (Mackey, Cambridge) and ‘convenience’ was mentioned usually with regards to wanting to wash whenever the respondent needed a particular item of clothing.

The fifth and final exemplary ladder that we discuss in this paper (Figure 6) is for the question ‘Would you consider buying a smaller refrigerator?’

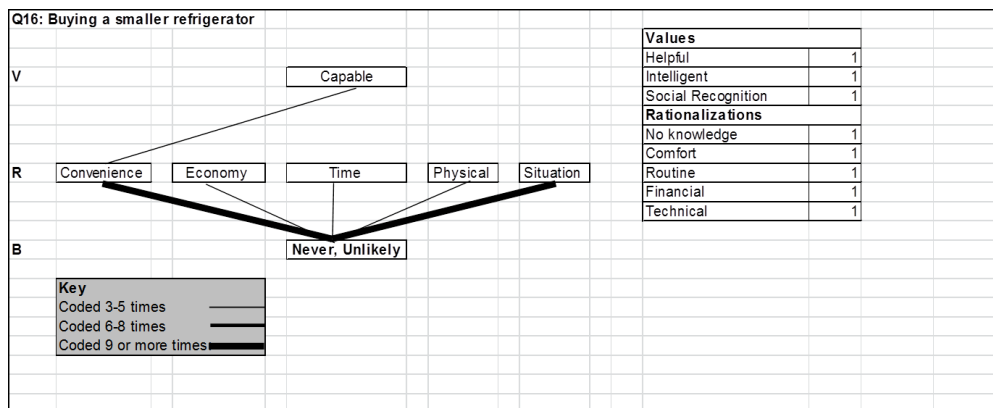


Figure 6: Aggregate ladder for negative responses to the question ‘Would you consider buying a smaller refrigerator?’

Table 1 showed that the large majority of respondents (78.4%) claimed they would never, or be unlikely to, downsize their refrigerator. This is in spite of the fact that many of these respondents appeared to be aware that this was one of the most effective ways to reduce their household’s energy consumption. ‘Capable’ is the only value which show up on the ladder. It is worth elaborating here on the link between rationalizations and this value, given that our previous research has shown this to be the value that exerts the most influence over energy-related behaviors in the home. While in many cases, the value ‘being capable’ underpinned rationalizations based on saving money, this is not always the case. Often people said they did something to save money and then stopped there as they were not able to derive a more abstract explanation for why this is important to them (you can see this in the above ladder where ‘economy’ does not lead to the value ‘capable’). The value ‘capable’ is about living life sensibly, achieving to the best one can, living in a capable sort of way. It is much broader than just saving money as the link between ‘capable’ and ‘convenience’ in this ladder shows.

The thick lines on the figure show that ‘convenience’ and ‘situation’ were the most popular reasons given for the unwillingness to make this change. The former was most often related to respondents shopping patterns and their unwillingness (or inability) to change these as the following respondent explains: “I have a very big refrigerator... and the reason is I only shop at the grocery or supermarket once a week when my care person comes” (Baledoy, Wellington). The latter was frequently related to the fit of the refrigerator – “the one that I’ve got... its heart and soul for me because it sits under the stairway, it fits perfectly and the door opens the correct way.... I’m unlikely to change that” (Barton, Wellington).

Discussion and Implications for Policy Makers

The aggregate value-to-behavior ladders varied considerably in complexity depending on the particular behavior. The five ladders presented in this paper demonstrate the wide range of possible paths that the behavior-to-value chains can take. These include paths which link one rationalization to multiple values and others which link several rationalizations to just one underpinning value. Another possible scenario is when the path links the behavior directly to the value and yet another possible path links the behavior just to a rationalization and not at all to a value. While the pathways that the ladders take differ greatly between specific energy-related behaviors, a number of commonalities were found in the data. Firstly, the links between the behavior and the rationalizations were generally much stronger than the links to the values. In fact, with 21 behaviors and 101 respondents there are 2121 potential individual ladders available that could lead to an identifying value but less than half of the ladders actually resulted in the identification of a core personal value. The repeated nature of the questioning on similar topics may partly explain this but the other key feature is

the that values are harder to express, given their abstract nature, than the more immediate rationalizations for doing, or not doing an energy-related behavior. Secondly, the respondents found it much harder to express values in relation to non-efficient behaviors than for efficient behaviors. We suspect that this is because these behaviors have little relationship to underlying values, but instead relate to habit. Thirdly, the findings relating to people's rationalization of their behavior suggest that there is a wide range of direct barriers and incentives relating to energy-efficient behavior. By concentrating on the intervening variables between behaviors and values (i.e. the rationalizations), we have provided some initial insights into why much of the previous literature has tended to find relatively weak links, or inconsistent links, between pro-environmental behaviors and personal values.

A main objective of this research has been to support policy makers in planning more targeted interventions to maximize uptake of smarter energy use by consumers. Thus from the findings discussed above, we deduct a number of specific recommendations for policy makers.

Firstly, we propose that a greater understanding of how values are linked to energy-related behaviors will provide policy makers with more relevant information on what factors drive (and/or inhibit) people to use energy in a more sustainable way thus allowing them to devise more targeted behavior-change interventions.

However, as we have discussed in this paper, it is difficult (and sometimes impossible) to get an accurate understanding of people's personal values as respondents are often unable to make the link between simple routinized behaviors and the more abstract values that possibly underpin these. There can also sometimes be a disjunction between people's core values and the way in which they behave. In this paper we have shown that rationalizations provide insights into the direct drivers and barriers to behavior change. Thus our second recommendation is that understanding peoples' rationalizations for behavior is important in seeking to identify appropriate interventions.

Given that our findings have shown that the rationalizations vary considerably for different behaviors, our third recommendation is that interventions should be designed on a behavior-by-behavior basis, on the basis of the most common rationalization supporting or in opposition to changing that behavior. Identifying the most common rationalization for given behaviors (as is outlined in the paper), will assist in crafting these behavior-specific interventions. For example, one of the main barriers identified to buying a smaller refrigerator was that it was 'not economic'. This suggests that a campaign aimed at making people aware of the long term financial gains that can be had from downsizing their refrigerator may be a useful strategy.

Fourthly, though in the above example financial reasons were identified as one of the main barriers to changing this particular behavior, the figures in Table 2 actually reveal that across the board, a lack of finance is not one of the most important barriers for more energy-efficient behaviors. Thus different approaches will be needed for other behaviors where this is not an important consideration (e.g. convincing people to wait until they have a full load before doing their washing, or to put more clothing on before turning up the heating). At the same time, there is a strong willingness and desire to move to more efficient behaviors – particularly for energy-efficient investments. In fact, economic efficiency was the most frequently cited rationalization for doing energy efficient behaviors (Table 2). This appears to translate to a desire for 'value for money' as opposed to simply reducing expenditure we and we recommend that this could be a strong message to push in communication campaigns.

Finally, situational constraints and opportunities were also hugely influential in people's behavior. This was one of the most common rationalizations across both negative and positive energy behaviors (Table 2) – either a situation holding back change, or a situation (e.g. appliance breakdown) compelling change. Thus we suggest that policy makers develop a program that creates situational opportunities.

Conclusion

It should be noted that the ladders in this research cannot be claimed to represent the sole causes or drivers of behavior. Behavior has many influences, some of which are able to be easily verbalized by individuals, and others which may be unable to be articulated or even

understood to be an influence. Nevertheless, the ‘ladders’ do give useful insights into people’s rationalizations for their behavior.

This paper reflects an interim point of the data analysis of the first stage of the Energy Cultures Project. Eventually, one application of these results will be to find out which segments of respondents are most likely to share the same rationalizations and values so that policy makers’ campaigns can target these people. Thus the next step our three-year research project is to link these values and rationalizations to specific preferences as demonstrated in choice modeling experiments that will represent the real trade-offs that consumers are required to make in decisions about using energy efficiently in the home.

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Endnotes

ⁱ We have used the term ‘rationalizations’ throughout our study to replace what Reynolds and Gutman (2001) have called ‘consequences’ as this was deemed easier to understand.

ⁱⁱ The names presented in the discussion are fictitious to preserve the confidentiality of the respondents

Acknowledgements

This research is the first stage of a three-year research project called ‘Energy Cultures’ based at the University of Otago in New Zealand. This project was made possible through a grant from the Foundation for Research, Science and Technology. We would like to thank the other members of the Energy Cultures research team and the Reference Panel for their feedback and support.