

Measuring Subjective Behaviour in Social Marketing: the Case of Household Energy Consumption

Dave Webb*

University of Western Australia

Email: dave.webb@uwa.edu.au

Geoffrey N. Soutar

University of Western Australia

Email: geoff.soutar@uwa.edu.au

Jillian C. Sweeney

University of Western Australia

Email: jill.sweeney@uwa.edu.au

Tim W. Mazzarol

University of Western Australia

Email: tim.mazzarol@uwa.edu.au

University of Western Australia

35 Stirling Highway

Crawley, WA, 6009

Australia

Tel (61-8-6488-7380)

Fax (61-8-6488-1004)

This research is conducted with the support of an Australian Research Council Linkage grant. Our linkage partners are the Public Utilities Office, Western Australia and Synergy, Western Australia

Keywords: energy saving behaviour, social marketing, measurement.

Measuring Subjective Behaviour in Social Marketing: the Case of Household Energy Consumption

Abstract

This paper examines the energy saving behaviour of a sample of householders in Western Australia. It uses a correspondence analysis to examine their existing energy saving activities as measured against a well-recognised set of common household related activities. For many social marketing campaigns the desired end-result is to achieve sustainable behaviour change. However, there are “easy” and “hard” behaviours that require attention. Knowing what to measure and the trade-offs between cost and accessibility is also important. This study sought to better define the measures associated with household energy conservation behaviour, particularly where it was not possible to secure access to actual consumption data. The paper discusses the approach taken and demonstrates the usefulness of correspondence analysis in developing a valid subjective measure of energy-saving behaviour. We highlight the potential value of the approach in other settings.

Background

For both economic and the environmental reasons energy conservation is becoming an increasingly important issue for governments, suppliers and consumers. Australia’s energy sector is heavily dependent on non-renewable resources, such as coal, oil and natural gas. Further, energy production from these sources releases harmful greenhouse gases that impact negatively on the environment (Living Greener 2012). These trends have meant that environmental issues have become increasingly important. For consumers, the rising cost of household energy remains a key concern, especially in Western Australia, where electricity charges have increased by more than 60% in recent years and substantial increases are expected in the near future.

Discussions about climate change and energy reduction often suggest consumers feel they have little control and a sense of helplessness, as individual or household actions are not seen to make much difference (Sustainable Energy Future, 2009; Sweeney *et al.* 2011). This can result in consumers being unlikely to change their behaviour (Corner and Randall 2011). This is a significant issue, because while utility agencies may wish to reduce household energy consumption, their ability to achieve sustainable reductions is dependent on consumers’ willingness to change their behaviours and to sustain these changes over the long-term.

Many agencies are using novel marketing communications and educational approaches to bring about sustained change in energy consumption behaviour. Examples of this are the federal Australian government’s National Living Greener (Living Greener 2012) and the West Australian state government’s ‘Switch the Future’ campaigns (Switch the Future 2012). However, assessing the effectiveness of such campaigns remains a key issue of interest to social marketers. While objective energy consumption data would be an ideal dependent variable in such analyses, objective actual consumption data is not usually available. Consequently, in the absence of such objective data, an important key question is: ‘What energy saving behaviours should be measured and would a combination of these behaviours provide an empirical and context valid measure of household energy behaviour?’ This question was the main focus of the present study, which is discussed in subsequent sections of the paper.

The Present Study

This project was undertaken as part of an Australian Research Council (ARC) funded linkage grant with the WA State Office of Energy and the State's largest energy retailer, Synergy (Synergy 2012b). It involved an online survey with a panel of 300 household consumers, who were randomly selected by an online research panel provider. The socio-demographic profile of the panel members was similar to WA households in general, although very low income households were not well represented, as sample members had to have internet access. Synergy was also able to provide the researchers with profiles of their customer segments, which indicated the sample was a good representation of this population. A small incentive was offered to panel members to respond to the survey, which is normal for online panel services. The sample was drawn only from the Perth metropolitan area, as rural and regional consumers have different household energy consumption patterns.

The questionnaire included items designed to measure specific behaviours relevant to reduced energy consumption that were identified from information gathered from Synergy and from the academic literature. Synergy's website was useful, as it contained a dedicated "energy saving tips" section that enabled the identification of eleven key behaviours, which are listed in Table 1. These behaviours were compared with energy consumption data for a typical household (Connections Research 2011). These behaviours are shown in Figure 1, and these data were used to ensure the questions related to these main areas in which energy is consumed within households.

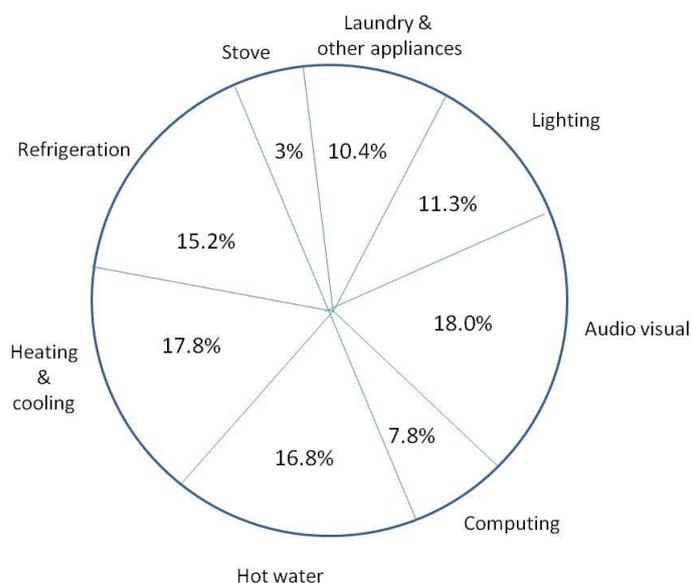


Figure 1: Energy consumption in a typical West Australian home (Connections Research 2011)

Respondents were asked how often they undertook the eleven behaviours using a seven-point scale that ranged from 1 (never) to 7 (always). As the overall purpose of the main study was to identify predictors of these behaviours, the survey also included additional items, such as perceptions of autonomy, competence and relatedness with respect to household energy consumption and what motivated them to try to save energy. However, this aspect of the study was not examined in the present paper, which is concerned with the behaviour items themselves. The analysis undertaken and the results obtained are discussed in the next section.

The Analysis and the Results

As was noted earlier, the eleven energy saving behaviours included in the present study can be seen in Table 1, which also shows the mean scores and standard deviations of the responses. As can be seen from the table, most respondents were trying to save energy, as all of the means are above the midpoint of the scale (4), although some behaviours (e.g. turning off lights, closing curtains and using energy efficient lights) were more common than others (e.g. turning appliance off completely and restricting the use of air-conditioners in peak periods). Further, as can be seen in the standard deviations, there was considerable variation in all of the items, suggesting additional examination of the data would be worthwhile.

Table 1: The Energy Saving Behaviours ¹

Behaviour	Mean	Std Deviation
Turn off the lights	5.98	1.221
Turn appliances off completely	4.66	1.667
Use energy efficient lights	5.72	1.508
Keep doors closed	4.83	1.682
Close curtains and/or blinds	5.76	1.342
Wear more or less clothing	5.68	1.416
Select energy efficient appliances	5.22	1.486
Use the washing machine on low temp	5.61	1.671
Restrict your use of the air conditioner	4.75	1.787
Set the temperature to energy efficient levels	5.24	1.606
Use cold rather than hot water	5.30	1.627

¹ Measured on a scale ranging from 1 (never) to 7 (always)

It was decided to use correspondence analysis to examine the data, as this procedure has been found to be useful in such situations (e.g. Hoffman and Franke, 1986; Green, Schaffer and Patterson 1988; Soutar and Wright, 1999). Correspondence analysis provides co-ordinate values for each row and column point in a data matrix, allowing the rows and the columns to be mapped. The multiple correspondence analysis procedure in the SPSS statistical software package was used to examine the data. The adjusted inertia value, which Greenacre (2007) suggests provides a better indication of the quality of a multiple correspondence map suggested 38% of the inertia was explained by the first axis. This suggests it provides a good measure of people's energy saving behaviour. Further, the scores of the scale points suggest that higher scores on this axis imply greater energy saving behaviour. The values of the eleven behaviours on this dimension are shown in Figure 2. As can be seen, people are most likely to turn lights off and least likely to turn appliances off completely. This latter point is not surprising, as people in the focus groups undertaken as part of the present study noted this was often a difficult thing to do, as plugs were hard to get to and they did not see the value of doing this. Interestingly, the "scores" ranged from 0.72 to 0.36, suggesting all of the behaviours were seen as relevant, as can also be seen in Table 1.

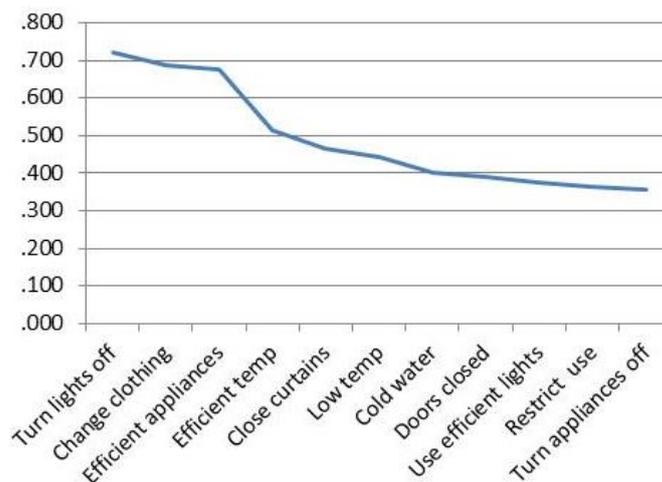


Figure 2: Energy saving behaviours

Of more interest was the scores obtained by the 300 respondents, as they could be termed “energy saving behaviour” scores. As can be seen in Figure 3, which provides a histogram of these scores, the distribution had a distinct negative skew, which was significant well beyond the 1% level. This suggests most respondents were involved in energy saving behaviour, although a small number are not. However, of more importance it the fact that a single score was obtained from eleven behaviours, which means subsequent analysis can use simpler methods than might have initially been thought to be the case. Further, it seems there are a small number of outliers in the sample who are disinterested in saving energy and thought needs to be given to how they might be treated in subsequent analysis.

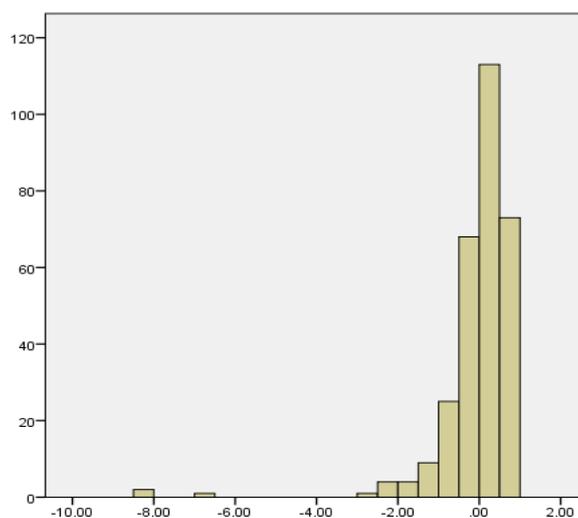


Figure 3: People's energy saving behaviour scores

As correspondence analysis can be complex and only one dimension was needed, it was decided to see whether a simple mean score of people's behaviour was closely related. The correlation between the two scores was 0.88, suggesting little would be lost by using this simple measure as a proxy for people's energy behaviour and that social marketers can use this proxy with confidence. An examination of the relationship between the energy saving behaviour scores obtained in this way and people's actual energy consumption would be an additional useful test of the score's “validity.” If there is a significant positive relationship, it suggests social marketers can safely use this easily and cheaply obtainable proxy when studying ways to impact on people's energy saving behaviour.

Conclusions

This study remains exploratory in nature and is part of a larger investigation of how to engage consumers of household energy to become more proactive in sustained energy saving behaviour. The findings suggest that there is a strong awareness and predisposition by most consumers to reduce energy consumption. Further, these consumers seem to have a sense of what actions they might take to reduce their consumption. As can be seen in Figure 2, most of these actions are relatively simple things that have been promoted by existing public campaigns. The more obvious actions, such as turning off lights, wearing warmer clothing rather than turning on heaters and purchasing energy efficient appliances, were the most strongly recognised and enacted behaviours. However, there was a noticeable decline in behaviours that might be deemed more expensive, difficult or complex (e.g. turning off appliances rather than having them on stand-by, or replacing light bulbs).

The apparent dichotomy between “easy” and “hard” energy saving behaviours is an important area for future research. It was an issue recognised by Synergy in their own in-house market research, and is something recognised by academic researchers who have argued that getting consumers to fully engage with actions that can address climate change requires more than social marketing. As was noted by Corner and Randall (2011 p. 1012), “...*motivating a proportional response to climate change (i.e. more than piecemeal changes in pro-environmental behaviour) will involve engaging people at a deeper level (and in a broader capacity) than is possible with the techniques of social marketing*”. As they suggest, the development of the necessary engagement strategies to affect sustained behaviour change is likely to require an interlinking of environmental education, value-based engagement and the enhancement of social capital and even broader citizenship.

Over the long-term the objective of any consumer focused social marketing campaign that is designed to achieve sustained behaviour change, will require shifting the consumer from the “easy” to the “hard” actions. For this to occur will require the consumer to not only learn what they should do, but also how and why they should do these things. This is likely to require a focus on intrinsic rather than extrinsic motivations (either positive or negative). The theory of self-determination (Deci and Ryan 1985) is likely to provide some valuable insights in how to shape consumer behaviour in this self-directed and sustainable way. However, it will also require a process of education, social networking and value-based engagement to fully deliver a successful social marketing campaign.

References

- Connections Research (2011). Australian residential electricity atlas 2011. <http://www.switchthefuture.com.au/Energy-Efficiency/> Last accessed 20 June 2012.
- Corner, A., and Randall, A. (2011) Selling climate change? The limitations of social marketing as a strategy for climate change public engagement. *Global Environmental Change*, 21 (3), 1005-1014.
- Deci, E.L, and Ryan, R.M. (1985) *Intrinsic Motivation and Self-determination in Human Behavior*. New York, NY: Plenum.

- Deci, E. L., Ryan, R. M., Gagné, M., Leone, D. R., Usunov, J., & Kornazheva, B. P. (2001). Need satisfaction, motivation, and well-being in the work organizations of a former Eastern Bloc country. *Personality and Social Psychology Bulletin*, 27 (8), 930-942.
- Green, P.E., Schaffer, C.M., Patterson, K.M. (1988). A reduced-space approach to the clustering of categorical data in market segmentation. *Journal of the Market Research Society*, 30 (3), 267-288.
- Greenacre M.J. (2007). *Correspondence analysis in practice*. Boca Raton, FL: Chapman & Hall/CRC.
- Hoffman, D.L., Franke, G.R. (1986). Correspondence analysis: Graphical representation of categorical data in marketing research. *Journal of Marketing Research*, 23 (3), 213-227.
- Ilardi, B. C., Leone, D., Kasser, R., & Ryan, R. M. (1993). Employee and supervisor ratings of motivation: Main effects and discrepancies associated with job satisfaction and adjustment in a factory setting. *Journal of Applied Social Psychology*, 23 (21), 1789-1805.
- Living Greener (2012). <http://www.livinggreener.gov.au/energy> last accessed 20 June 2012.
- Moller, A.C., Ryan, R.M., and Deci, E.L., (2006). Self-determination theory and public policy: Improving the quality of consumer decisions without using coercion. *Journal of Public Policy and Marketing*, 25 (1), 104-116.
- Pelletier, L.G., Tuson, K.M., Beaton, A.M., Green-Demers, I. & Noels, K. (1998). Why are you doing things for the environment? The motivation towards the environment scale (MTES). *Journal of Applied Social Psychology*. 28 (5), 437-468.
- Soutar, G.N., Wright, K. (1999). Export markets: A correspondence analysis. In J. Cadeaux & M. Uncles (Eds.). *Proceedings of the Australian and New Zealand Marketing Academy Conference*. Sydney: School of Marketing, University of New south Wales.
- Sweeney, J., Webb, D., Soutar, G.N., Mazzarol, T (2011), *Self-Determination Theory and WOM*. Published as abstract in ANZMAC 2011, Perth proceedings.
- Switch the Future (2012). <http://www.switchthefuture.com.au/> Last accessed 20 June 2012.
- Synergy (2012a). http://www.synergy.net.au/at_home/prices.xhtml last accessed 20 June 2012.
- Synergy (2012b). http://www.synergy.net.au/at_home/energy_saving_tips.xhtml last accessed 20 June.
- Weinstein, N., and Ryan, R. M., (2010). When helping helps: Autonomous motivation for prosocial behaviour and its influence on well-being for the helper and the recipient. *Journal of Personality and Social Psychology*. 98 (2), 222-244.