

Consumer perspectives on product lifetimes: a national study of lifetime satisfaction and purchasing factors

Gnanapragasam A.^(a), Cooper T.^(a), Cole C.^(a) and Oguchi M.^(b)

a) Product Design, Nottingham Trent University, Nottingham, United Kingdom

b) National Institute for Environmental Studies, Tsukuba, Japan

Keywords

Circular economy
Consumer goods
Lifespan labelling
Product lifetimes
Throwaway society

Abstract

The extension of product lifetimes of consumer goods has the potential to encourage sustainable consumption, reduce carbon emissions and facilitate a transition to a circular economy. However, current understandings of consumer perspectives on product lifetimes are limited. This paper presents the findings of the first national study of consumer satisfaction with product lifetimes across an exhaustive range of consumer durables. The research was undertaken in the United Kingdom where consumer satisfaction and purchasing factors were studied across eighteen product categories. These product categories were devised from academic and market research undertaken at Nottingham Trent University. In total, 2,207 participants completed the survey and the sample profile was similar to the United Kingdom's population with respect to age and gender. The results indicate that consumers appear generally satisfied with the lifetimes of their products and suggest that efforts to extend product lifetimes should focus on developing business and policy options. However, participants also emphasised that longevity, reliability and guarantee length were important factors in their purchasing decisions. Consumer interest in these factors could indicate that lifetime labelling and the promotion of longer guarantees by manufacturers and retailers may offer pathways to reduce energy and material consumption associated with short-lived products, facilitating movement towards a low carbon circular economy.

Introduction

Materially-rich lifestyles across the world exert ever-increasing demands on the planet (Trentmann, 2016). Global improvements in standards of living are driving spiralling consumer demand for products (Wilk, 1998). In the United Kingdom (UK), the design, production, distribution, use and disposal of these products account for a significant proportion of energy and material demand (Norman et al., 2016; Salvia et al., 2016). These products embody carbon (Allwood & Cullen, 2012), and their decreasing lifetimes characterised by the 'throwaway society' (Cooper, 2004, 2010b), represents a significant challenge to meeting carbon reduction targets (IPCC, 2014) and attaining a circular economy (Montalvo, Peck, & Rietveld, 2016).

Encouraging consumers to purchase longer-lasting products could abate the "churn" (Cox, Griffith, Giorgi, & King, 2013, 27) of consumer goods, and would minimise environmental impacts (ERM, 2011). Previous research has asserted that consumers are interested in how long products last (ERM, 2011; Knight, King, Herren, & Cox, 2013). However, consumers have also shown limited concern for the environmental impacts of discarded products (Cox et al., 2013), while continually expecting innovation and psychologically linking products to their

identity and success (Cox et al., 2013; Wieser, Tröger, & Hübner, 2015).

Research into consumer satisfaction and expectations of product lifetimes is an emerging field of enquiry. While product categories that include electrical and electronic equipment (EEE) (CTA, 2014; Cooper, 2004; Echegaray, 2016; Knight et al., 2013; Oguchi et al., 2016; Tasaki, Terazono, & Moriguchi, 2004; Wilhelm, Yankov, & Magee, 2011) and clothing (Langley, Durkacz, & Tanase, 2013a, 2013b) have been extensively studied, other products, such as carpets and boilers, have rarely been evaluated (Cox et al., 2013; Wieser et al., 2015).

This paper reports the findings of the first nationwide survey of consumer satisfaction with current product lifetimes, which was undertaken across eighteen product categories and conducted in the UK in February 2017. The paper outlines the formulation of the product categories, the design of the consumer survey and describes the data analysis undertaken. The research findings are summarised, with the degree of consumer satisfaction with product lifetimes and the importance of reliability and longevity in comparison to other purchasing factors are examined. Finally, the role of consumers, businesses and government in facilitating the choice of longer-lasting

products is examined, and the contribution they can make to reducing the environmental impacts of products and achieving a circular economy is explored.

Methods

Product categories

An evaluation of the United Nations’ Statistics Division’s (UNSD, 1999) Classification of Individual Consumption According to Purpose (COICOP) and Mintel Academic market research database (e.g. Carroll, 2017) identified over 400 products that could be classified as durable goods. Durable goods are defined as products “that may be used repeatedly or continuously over a period of more than a year” (UN, EC, OECD, IMF & World Bank, 2009, p. 184). Owing to time and cost constraints, it was not considered feasible to conduct a national survey of consumer satisfaction with product lifetimes at the product level. Consequently, a product categorisation scheme was developed using COICOP, Mintel reports and previous consumer studies of product lifetimes (e.g. Cooper, 2004; Cox et al., 2013; Wieser et al., 2015) (see Gnanapragasam, Oguchi, Cole, & Cooper, 2017, this volume). These eighteen product categories were designed to be representative of the entire range of consumer durables, thus achieving a comprehensive consumer survey (Dillman, Smyth, & Christian, 2014).

Consumer survey

An online survey was designed to assess consumer satisfaction with product lifetimes across these eighteen categories. The questionnaire included items on purchasing factors and satisfaction with product lifetimes (e.g. Knight et al., 2013) (see Figure 2 in the appendix). In addition, demographic information, such as gender and age, was also collected. Each participant answered questions on up to nine of the eighteen product categories to minimise potential survey fatigue and non-response (Dillman et al., 2014).

Likert items were used to assess consumer satisfaction with product lifetimes. A Likert scale (ranging from ‘very dissatisfied’ to ‘very satisfied’) was utilised to assess consumer lifetime satisfaction with the eighteen product categories. As each of the product categories encompassed a range of products, it was not possible for participants to estimate lifetime expectations in years. A Likert-type scale (ranging from ‘not at all important’ to ‘extremely important’) was used to gauge the level of importance that participants assigned to the following purchasing factors: Appearance, brand, guarantee length, longevity, price and reliability. The importance of reliability as a purchasing factor was studied for bicycles, cars, electronic goods, jewellery, clocks and watches, large kitchen appliances, power tools for the home and garden, small household appliances, and space heating and cooling products because, unlike other categories, these products contain complex electrical, electronic or mechanical parts.

Sampling strategy

As suggested by Bryman (2008) and Robson (2011), extensive pilot testing was undertaken with participants from different backgrounds to ensure the questionnaire was readily understood. Participant recruitment was conducted by a market research company (JRA Research) who recruited from an opt-in consumer panel to meet age and gender quotas derived from the UK population. The sample characteristics deviated from the UK population by no more than 3.58% for gender and 5.35% for age (see Tables 2 and 3 in the appendix). The data presented in this paper is unweighted, as with the exception of one characteristic (participants aged 18-24), the sample characteristics remained within 5% of the UK population, which is an acceptable standard in the discipline of market research (Sarstedt & Mooi, 2011). In addition, weighting has not been implemented by recent studies into consumer expectations of product lifetimes (Hennies & Stamminger, 2016; Wieser et al., 2015).

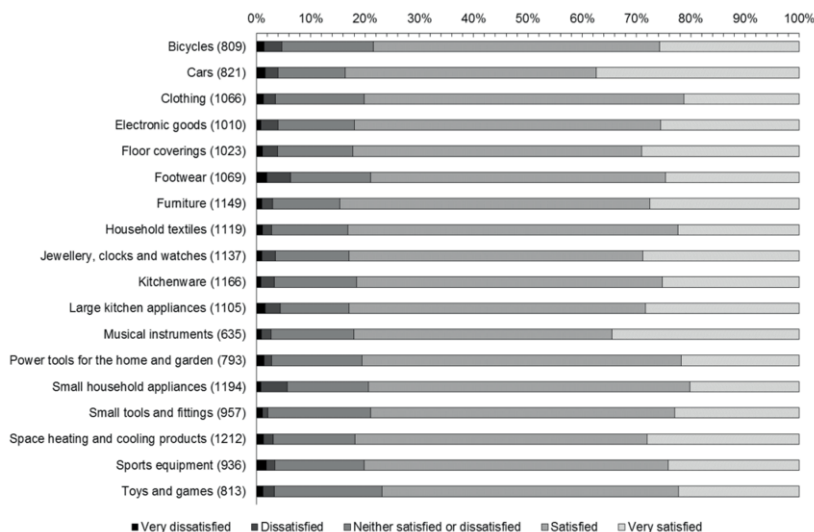


Figure 1. Consumer satisfaction with product categories.

Data analysis

The data for levels of satisfaction and purchasing factors were prepared for analysis by excluding responses where participants had stated that they could not answer the question. The findings were tabulated a compound percentage bar chart was produced to facilitate visual comparison of consumer satisfaction data across the eighteen product categories. Purchasing factors were assigned a numerical value (i.e. from 1 for 'not at all important' to 5 for 'extremely important') and the median scores were calculated.

Results

Study coverage

In total, 2,207 participants completed the consumer survey. Response rates for each product category ranged between 635 (for musical instruments) to 1,212 (for space heating and cooling products).

Consumer satisfaction

Figure 1 depicts levels of satisfaction with lifetimes across eighteen product categories. Overall, the majority of the respondents in this study indicated that they were satisfied with the lifetimes of their durable goods. When 'very satisfied' and 'satisfied' were aggregated, all product categories illustrated high satisfaction levels, ranging from 77% satisfaction for toys and games to 85% satisfaction for furniture. In contrast, only a small proportion of respondents indicated that they were 'dissatisfied' or 'very dissatisfied' with product lifetimes. Aggregating these responses, participants who reported dissatisfaction with product lifetimes ranged from 2% for small tools and fittings to 6% for both footwear and small household appliances.

The product category with the highest proportion of respondents who were 'very satisfied' was cars (37%), followed by musical instruments (34%). In contrast, the product category which showed the lowest proportion of respondents who were 'very satisfied' was clothing (21%). The product category with the highest proportion

of respondents indicating that they were 'dissatisfied' was small household appliances (5%). In contrast, the lowest proportion of respondents indicated that they were 'dissatisfied' with both power tools and small tools (1%). Very few respondents stated they were 'very dissatisfied' with product lifetimes: 2% recorded that they were 'very dissatisfied' with the lifetimes of footwear, large kitchen appliances, cars and sports equipment. Across all other product categories, only 1% of respondents were 'very dissatisfied'.

Purchasing factors

The median values for purchasing factors were calculated across the eighteen product categories to determine their relative importance (Table 1). The results illustrate that reliability was an 'extremely important' purchasing factor in the categories in which it was studied. Longevity was 'extremely important' for furniture, floor coverings, large kitchen appliances, power tools, cars, electronic goods, and space heating and cooling products. For the remaining eleven categories, longevity was considered to be 'very important'. Price was identified as 'very important' for all product categories apart from cars, for which it was 'extremely important'. Guarantee length was considered 'very important' for eleven product categories and 'moderately important' for seven product categories. Brand was identified as 'moderately important' for all categories with the exception of cars and electronic goods, for which it was 'very important'. Finally, the results for appearance show the most variability across the product categories. For clothing, furniture, floor coverings, household textiles, kitchenware and jewellery, it was identified as 'extremely important'. For the remaining twelve product categories, appearance was considered 'very important' for six and 'moderately important' for the other six.

Discussion

Study coverage

This study provides the first example of a national survey of consumer satisfaction with product lifetimes across

	Appearance	Brand	Guarantee	Longevity	Price	Reliability
Bicycles	Very	Moderately	Very	Very	Very	Extremely
Cars	Very	Very	Very	Extremely	Extremely	Extremely
Clothing	Extremely	Moderately	Moderately	Very	Very	
Electronic goods	Moderately	Very	Very	Extremely	Very	Extremely
Floor coverings	Extremely	Moderately	Very	Extremely	Very	
Footwear	Very	Moderately	Moderately	Very	Very	
Furniture	Extremely	Moderately	Very	Extremely	Very	
Household textiles	Extremely	Moderately	Moderately	Very	Very	
Jewellery, clocks and watches	Extremely	Moderately	Very	Very	Very	Extremely
Kitchenware	Extremely	Moderately	Moderately	Very	Very	
Large kitchen appliances	Very	Moderately	Very	Extremely	Very	Extremely
Musical instruments	Very	Moderately	Very	Very	Very	
Power tools for the home and garden	Moderately	Moderately	Very	Extremely	Very	Extremely
Small household appliances	Moderately	Moderately	Very	Very	Very	Extremely
Small tools and fittings	Moderately	Moderately	Moderately	Very	Very	
Space heating and cooling products	Moderately	Moderately	Very	Extremely	Very	Extremely
Sports equipment	Very	Moderately	Moderately	Very	Very	
Toys and games	Moderately	Moderately	Moderately	Very	Very	

Table 1. Importance of purchasing factors.

the complete range of durable goods. Responses were received from 2,207 individuals across the UK and the sample characteristics broadly match that of the UK population aged 18 and above (ONS, 2016) (see Tables 2 and 3 in the appendix). The similarity of this sample to the UK population indicates that this study is representative, this follows previous research conducted by Skelton and Allwood (2017) and Wieser et al. (2015). Additionally, the response rates in each product category for this research compare favourably to those in recent research into consumer expectations of product lifetimes (e.g. Hennies & Stamminger, 2016; Wieser et al., 2015) and are comparable to those achieved in a recent study of regretted consumption (Skelton & Allwood, 2017).

Consumer satisfaction

Consumer levels of satisfaction were found to be uniformly high across the eighteen product categories under investigation. These findings contrast with that of Cooper and Mayers (2000) in which almost 45% of participants asserted that most EEE did not last as long as they would like it to. The findings of this research were similar to that of a recent study conducted on EEE in the UK by Knight et al. (2013) which found the majority of participants to be mostly satisfied with how long their products lasted. This may indicate that there has been a temporal trend of increasing satisfaction with product lifetimes which parallels the decline in consumer expectations of product lifetimes in the UK (Gnanapragasam et al., 2017, this volume).

If most consumers are generally satisfied with product lifetimes, as this study would indicate, then future efforts towards “slowing resource loops” (Bakker, Wang, Huisman, & den Hollander, 2014, p. 309) and achieving a circular economy through the proliferation of longer lasting products should, perhaps, focus on the business case (e.g. Bocken, Short, Rana, & Evans, 2014), public policy (Cooper, 2010a; Ervine, 2010) and environmental arguments (ERM, 2011; Norman et al., 2016), instead of consumer concern. Additional qualitative research could serve to deepen our understanding of consumer satisfaction with current product lifetimes, perhaps deciphering why today’s consumers are satisfied with lifetimes of products even while some are, arguably, in decline.

Purchasing factors

While dissatisfaction with product lifetimes was not evident, this study found that consumers placed comparatively greater importance on reliability and longevity in comparison to the other four purchasing factors surveyed, including price, across all eighteen

product categories (Table 1). Previously, it has been suggested that product lifetime information should be clearly communicated to consumers so that they can make informed purchasing decisions (Cooper & Christer, 2010; Knight et al., 2013; Montalvo et al., 2016). Strategies such as lifetime labelling have been positively received by consumers across a range of products (SIRCOME, University of South Brittany, & University of South Bohemia, 2016). Lifetime labelling could enable consumers to consider information on product lifetimes into account when making purchasing decisions. Additionally, consumers considering guarantee length to be a ‘very important’ purchasing factor for the majority of product categories. This indicates that the introduction and effective communication of longer lifetime guarantees by manufacturers and retailers may entice consumers to purchase longer-lasting products (Cooper & Christer, 2010; Knight et al., 2013). In summary, both lifetime labelling and the provision of longer guarantees could encourage greater uptake of longer-lasting products, helping to slow and reduce material demand and enact the circular economy at the product level (Bakker et al., 2014).

Conclusions

This paper reported the findings of the first national study of consumer satisfaction with product lifetimes across the entire range of consumer durables. The study found that overall, UK participants appear satisfied with the lifetimes of their durable goods. It also revealed that consumers consider reliability, longevity and guarantee length to be comparatively important factors when making purchasing decisions. While it appears that consumers may be satisfied with arguably declining product lifetimes (Gnanapragasam et al., 2017, this volume), the importance consumers place on longevity, durability and guarantee length may foster opportunities for the development of lifetime labelling and the provision of longer guarantees for durable goods. The findings of this study indicate that government, manufacturers and retailers may be best-positioned to encourage the uptake of longer-lasting products, reducing consumption (Cooper, 2005), driving efforts towards a circular economy (Montalvo et al., 2016) and enabling carbon emissions reduction targets to be met (Salvia et al., 2016).

Acknowledgments

This project was financially supported by the UK’s Engineering and Physical Sciences Research Council’s Centre for Industrial Energy, Materials and Products (grant reference EP/N022645/1). The authors would like to thank Dr Angela Roberts for providing detailed comments on drafts of this paper.

References

- Allwood, J. M., & Cullen, J. M. (2012). *Sustainable materials with both eyes open*. Cambridge: UIT Cambridge Ltd.
- Bakker, C., Wang, F., Huisman, J., & den Hollander, M. (2014). Products that go round: exploring product life extension through design. *Journal of Cleaner Production*, 69, 10–16.
- Bocken, N. M. P., Short, S. W., Rana, P., & Evans, S. (2014). A literature and practice review to develop sustainable business model archetypes. *Journal of Cleaner Production*, 65, 42–56.
- Bryman, A. (2008). *Social research methods*. Oxford: Oxford University Press.

- Carroll, N. (2017). *Electrical Goods Retailing - UK - February 2017*. London: Mintel. Retrieved from <http://academic.mintel.com/display/792417/>
- Consumer Technology Association. (2014). *CE Product Life Cycle*. Washington DC: Consumer Electronics Association.
- Cooper, T. (2004). Inadequate life? Evidence of consumer attitudes to product obsolescence. *Journal of Consumer Policy*, 27(4), 421–449. <https://doi.org/10.1007/s10603-004-2284-6>
- Cooper, T. (2005). Slower consumption: reflections on product life spans and the 'throwaway society'. *Journal of Industrial Ecology*, 9(1–2), 51–67.
- Cooper, T. (2010a). Policies for longevity. In T. Cooper (Ed.), *Longer lasting products: alternatives to the throwaway society* (pp. 215–239). Farnham: Gower.
- Cooper, T. (2010b). The significance of product longevity. In T. Cooper (Ed.), *Longer lasting products: alternatives to the throwaway society* (pp. 3–36). Farnham: Gower.
- Cooper, T., & Christer, K. (2010). Marketing durability. In T. Cooper (Ed.), *Longer lasting products: alternatives to the throwaway society* (pp. 273–296). Farnham: Gower.
- Cooper, T., & Mayers, K. (2000). *Prospects for household appliances*. Halifax: Urban Mines.
- Cox, J., Griffith, S., Giorgi, S., & King, G. (2013). Consumer understanding of product lifetimes. *Resources, Conservation and Recycling*, 79, 21–29. <https://doi.org/10.1016/j.resconrec.2013.05.003>
- Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). *Internet, phone, mail, and mixed-mode surveys: the tailored design method* (Fourth). Hoboken: Wiley.
- Echegaray, F. (2016). Consumers' reactions to product obsolescence in emerging markets: the case of Brazil. *Journal of Cleaner Production*, 134, 191–203. <https://doi.org/10.1016/j.jclepro.2015.08.119>
- Environmental Resources Management. (2011). *Longer product lifetimes*. London: Defra.
- Ervine, C. (2010). Durability and the law. In T. Cooper (Ed.), *Longer lasting products: alternatives to the throwaway society* (pp. 181–194). Farnham: Gower.
- Gnanapragasam, A., Oguchi, M., Cole, C., & Cooper, T. (2017). Consumer expectations of product lifetimes around the world: a review of global research findings and methods. In C. Bakker & R. Muge (Eds.), *Product Lifetimes and the Environment (PLATE) 2017 Conference proceedings*. Delft: Delft University of Technology.
- Hennies, L., & Stamminger, R. (2016). An empirical survey on the obsolescence of appliances in German households. *Resources, Conservation and Recycling*, 112, 73–82. <https://doi.org/10.1016/j.resconrec.2016.04.013>
- Intergovernmental Panel on Climate Change. (2014). *Fifth Assessment Synthesis Report*. Geneva: IPCC Secretariat. Retrieved from http://www.ipcc.ch/pdf/assessment-report/ar5/syr/SYR_AR5_LONGERREPORT.pdf
- Knight, T., King, G., Herren, S., & Cox, J. (2013). *Electrical and electronic product design: product lifetime*. Banbury: Brook Lyndhurst for WRAP. Retrieved from <http://www.wrap.org.uk/sites/files/wrap/WRAP%20longer%20product%20lifetimes.pdf>
- Langley, E., Durkacz, S., & Tanase, S. (2013a). *Clothing longevity and active use*. Unpublished manuscript. Banbury: WRAP.
- Langley, E., Durkacz, S., & Tanase, S. (2013b). *Clothing longevity and measuring active use. Summary report*. Banbury: Ipsos MORI for WRAP.
- Montalvo, C., Peck, D., & Rietveld, E. (2016). *A longer lifetime for products: benefits for consumers and companies*. European Parliament, Directorate General for Internal Policies. Retrieved from [http://www.europarl.europa.eu/RegData/etudes/STUD/2016/579000/IPOL_STU\(2016\)579000_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/STUD/2016/579000/IPOL_STU(2016)579000_EN.pdf)
- Norman, J. B., Serrenho, A. C., Cooper, S. J. G., Owen, A., Sakai, M., Scott, K., ... Allwood, J. M. (2016). *A whole system analysis of how industrial energy and material demand reduction can contribute to a low carbon future for the UK*. CIE-MAP. Retrieved from <http://ciemap.leeds.ac.uk/wp-content/uploads/2016/04/CIEMAP-Report.pdf>
- Office for National Statistics. (2016). Population estimates analysis tool. Retrieved 4 April 2017, from <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/populationestimatesanalysisistool>
- Oguchi, M., Tasaki, T., Daigo, I., Cooper, T., Cole, C., & Gnanapragasam, A. (2016). Consumers' expectations for product lifetimes of consumer durables. Presented at Electronics Goes Green 2016, Berlin: Fraunhofer IZM. Retrieved from <http://irep.ntu.ac.uk/id/eprint/28621/>
- Robson, C. (2011). *Real world research: a resource for users of social research methods in applied settings* (3rd ed.). Chichester: Wiley.
- Salvia, G., Braithwaite, N., Moreno, M., Norman, J., Scott, K., Sung, K., ... Cooper, T. (2016). *Understanding consumption: why and how do we use products?* Leeds: CIE-MAP. Retrieved from <http://ciemap.leeds.ac.uk/wp-content/uploads/2017/03/CIEMAP-REPORT-2-1.pdf>
- Sarstedt, M., & Mooi, E. (2011). *A concise guide to market research*. Heidelberg: Springer.
- SIRCOMe, University of South Brittany, & University of South Bohemia. (2016). *The influence of lifespan labelling on consumers*. Brussels: European Economic and Social Committee. Retrieved from <http://www.eesc.europa.eu/resources/docs/qe-04-16-076-en-n.pdf>
- Skelton, A. C. H., & Allwood, J. M. (2017). Questioning demand: a study of regretted purchases in Great Britain. *Ecological Economics*, 131, 499–509. <https://doi.org/10.1016/j.ecolecon.2016.06.028>
- Tasaki, T., Terazono, A., & Moriguchi, Y. (2004). A survey on consumer disposal behavior of electric home appliances for encouraging products' long-term use and reuse. *Journal of the Japan Society of Waste Management Experts*, 15(4), 310–319. <https://doi.org/10.3985/jswme.15.310>
- Trentmann, F. (2016). *Empire of things: how we became a world of consumers, from the fifteenth century to the twenty-first*. London: Allen Lane.
- United Nations, European Commission, Organisation for Economic Co-operation and Development, International Monetary Fund, & World Bank. (2009). *System of National Accounts 2008*. New York: United Nations. Retrieved from <https://unstats.un.org/unsd/nationalaccount/sna2008.asp>
- United Nations Statistics Division. (1999). *Detailed structure and explanatory notes: COICOP*. New York: United Nations Statistics Division. Retrieved from <http://unstats.un.org/unsd/cr/registry/regst.asp?Cl=5>
- Wieser, H., Tröger, N., & Hübner, R. (2015). The consumers' desired and expected product lifetimes. In T. Cooper, N. Braithwaite, M. Moreno, & G. Salvia (Eds.), *Product Lifetimes and the Environment (PLATE) Conference proceedings* (pp. 388–393). Nottingham: Nottingham Trent University. Retrieved from <http://www.plateconference.org/consumers-desired-expected-product-lifetimes/>
- Wilhelm, W., Yankov, A., & Magee, P. (2011). Mobile phone consumption behavior and the need for sustainability innovations. *Journal of Strategic Innovation and Sustainability*, 7(2), 20–40.
- Wilk, R. (1998). Emulation, Imitation, and Global Consumerism. *Organization & Environment*, 11(3), 314–333. <https://doi.org/10.1177/0921810698113003>

Appendix

A. In general, how important are the following when you are buying [product category]?	
a) How the product looks, b) brand, c) How long the product will last, d) How reliable the product will be, e) Length of guarantee provided, f) price.	
1 Not at all important, 2 slightly important, 3 moderately important, 4 very important, 5 extremely important, 6 do not know/ cannot say.	
B. In general, how satisfied or dissatisfied have you been with how long your [product category] lasted?	
1 Very dissatisfied, 2 dissatisfied, 3 neither satisfied or dissatisfied, 4 satisfied, 5 very satisfied, 6 do not know/ cannot say.	

Figure 2. Survey questions.

	UK population (%)	Survey sample (%)
Female	51.26	47.68
Male	48.74	52.32

Table 2. Gender profile of sample.

	UK population (%)	Survey sample (%)
18 – 24	11.45	16.80
25 – 44	33.50	28.84
45 – 64	32.43	36.24
65 – 74	12.35	12.40
75+	10.27	5.72

Table 3. Age profile of sample.