Slower Consumption

Reflections on Product Life Spans and the "Throwaway Society"

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Keywords

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Summary

Sustainable consumption is unlikely to be achieved as long as the quantity of household waste generated in industrial nations continues to rise. One factor underlying this trend is the life span of household goods. This article contributes to recent advances in life-cycle thinking by highlighting the significance of product life spans for sustainable consumption and exploring the current state of research. A theoretical model is developed to demonstrate how, by contributing to efficiency and sufficiency, longer product life spans may secure progress toward sustainable consumption. Empirical research undertaken in the United Kingdom on consumer attitudes and behavior relating to the life spans of household products is reviewed and factors that influence the market for longer-lasting products are discussed. A need is identified for further research on product life spans and some themes are proposed.

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Introduction

Sustainable consumption has been defined by the Organisation for Economic Cooperation and Development (OECD 2002a) as "the consumption of goods and services that meet basic needs and quality of life without jeopardizing the needs of future generations." This may be interpreted in many different ways, but there is a general consensus that for industrialized countries, at least, it implies a reduction in the throughput of resources. This requires a shift from a linear economy to a circular economy so that inputs of virgin raw material and energy and outputs in the form of waste requiring disposal decline (Cooper 1994). This approach is increasingly recognized in public policy and long established in countries such as Germany (through its Closed Substance Cycle and Waste Management Act) and Sweden (through the work of its Ecocycle Commission).

In Britain, McLaren and colleagues (1998) calculated that a fair use of "environmental space" (the earth's capacity to support human activities) requires that the nation cut its consumption of steel, aluminum, and energy by over 80% by 2050, implying reductions of at least 20% by 2010. For timber, the figures are 73% by 2050 and 65% by 2010—a dramatic short-term reduction. Such analysis has prompted renewed interest in energy and material flows (e.g., Biffa 1997; DEFRA 2002) and has led to the emergence of resource productivity on the public policy agenda (Cabinet Office 2001a; Green Alliance 2002; OECD 2001; Sustainable Development Commission 2003).

The literature on sustainable development increasingly recognizes a need to address resource throughput, but only rarely is mention made of the potential role of longer product life spans in slowing it down. Increased longevity could be achieved by greater intrinsic product durability and by improved maintenance through careful use, repair, upgrading, and reuse ("product life extension"). Product durability and product life extension were key themes in an early contribution to the debate on sustainable production and consumption by the World Business Council for Sustainable Development (Falkman 1996), and in promoting the "factor four" concept, von Weizsäcker and colleagues (1997, p. 70) argued that "durability is one of the most obvious strategies for reducing waste and increasing material productivity." Likewise McLaren and colleagues (1998, 53) described durability and reuse as "critical in increasing overall efficiency" in resource use. Despite such sentiments from industrialists and environmentalists, however, the twin themes of product durability and product life extension have attracted relatively little research interest to date, and whether the academic community regards them as central or peripheral to sustainability discourse remains unclear.[1]

This article considers the proposition that greater attention must be paid to product life spans for industrial nations to make adequate progress toward sustainable consumption. It presents a theoretical model to demonstrate how, by contributing to efficiency and sufficiency, longer product life spans may be needed to secure progress toward sustainable consumption. A discussion of product life spans in the context of life-cycle thinking is followed by a review of recent empirical research and factors that influence the market for longer-lasting products. A need for further research on product life spans is identified and some themes are proposed.

Resources and the "Throwaway Society"

Municipal waste in industrialized countries has been increasing at around the same rate as economic growth, around 40% over the past 30 years, and "the delinking of effluence from affluence remains elusive" (OECD 2001). Despite evident public concern about waste (DEFRA 2001), the popular concept of a "throwaway society" is rarely explored in adequate depth and, with a few exceptions (e.g., Redclift 1996; Strasser 1999; Thompson 1979), there is a dearth of academic research linking waste to the consumption of household goods. A reasonably substantial body of literature explores consumption in a sociocultural context (e.g., Cross 1993; Featherstone 1991; Lury 1996), complementing the extensive marketing research on why and how individuals consume. Some (more limited) research into disposal behavior investigates why individuals discard products (Antonides 1990; Bayus 1988; Box 1983; Boyd and McConocha 1996; Cooper

and Mayers 2000; Hanson 1980; Harrell and McConocha 1992; Jacoby et al. 1977).

Explanations for the growth and persistence of our prevailing throwaway culture, however, have been less adequately addressed. This perhaps reflects a failure in liberal democracies to associate waste with consumer choice. Until recently, public policy has appeared to equate increased consumption and human happiness (Donovan and Halpern 2002). Consumer sovereignty has been regarded as sacrosanct and consumer choice treated as a "right." Advocacy of restrained consumption, by contrast, is often marginalized in public debate. Hansen and Schrader (1997, p. 444), though, have proposed a new model of sustainable consumption critical of "the model of consumer sovereignty according to which individual consumer behavior is seen as ethically neutral." They conclude (p. 455) that "the consumer should no longer tolerate and bring about what he objects to as a citizen."

In earlier environmental debate, arguments for using resources carefully were often motivated by concern about depleting finite resources (e.g., Conn 1977). A consensus is now appearing that although materials scarcity does not pose a serious threat in the short or medium term, the environment has a limited ability to absorb material streams without being harmed and reserves of fossil fuels are limited (Frosch and Gallopoulos 1989; Westkämper et al. 2000). The more recent debate on resource productivity has been prompted by a desire to reconcile economic and environmental objectives (an efficiency objective) and a concern that excessive consumption in affluent nations is at the expense of people in less industrialized nations and of future generations (a moral objective).

One important determinant of resource productivity is the length of the period over which resources are used. When the British Government's Performance and Innovation Unit (PIU) produced a report on resource productivity, the process was as revealing as the final report. In its initial Scoping Note, the PIU highlighted five ways of increasing resource productivity, the first of which was "resource prolonging" by increasing durability, decreasing turnover rates (i.e., presumably, less frequent replacement), and redesigning products (or components) for longer use; another was the reuse of products or components (Cabinet Office 2001b). The published report, however, excluded any reference to resource prolonging or reuse (Cabinet Office 2001a). The implied challenge to traditional approaches to economic policy was evidently too profound for Treasury officials to accept.

The Treasury's stance may be explained by the conventional economic wisdom that growth in GNP, which requires ever-rising consumer spending, should be its principal policy objective. By contrast, a trend toward longer-lasting products would appear liable to reduce or even reverse growth (although in practice the outcome would depend on many complex factors, including employment practices and people's spending aspirations). Thus the PIU's final report addressed the need for resource productivity, considered measurement issues, and proposed strategic tools (e.g., the role of market-based instruments, innovation, public procurement, and cultural change), but excluded any reference to durability or other more specific and detailed mechanisms.

Slow Consumption

Beyond the corridors of power in Britain, an alternative model of consumption is being developed in which temporal factors are taken more fully into consideration. Reisch (2001) notes critically that "mainstream economics is deeply embedded in modernity's vision of progress and growth" (p. 369) in which "time is money" and people consume ever faster: "timescales of consumption are steadily decreasing due to shorter product life spans and an increasing speed of product innovations which are in turn the outcome of accelerating R&D processes" (p. 371).[2] Noting the "new models of wealth" being developed by Germany's Wuppertal Institute, she suggests that human well-being derives in part from the attention people give to their possessions and their involvement with them, and notes that this attention and involvement requires time. Thus, she concluded, "the assumption of nonsaturation which is at the core of economic theory must be challenged" (p. 378).

The PIU's approach to resource productivity focused on eco-efficiency, the potential for

reducing environmental impacts and economic costs simultaneously through more efficient use of energy and materials. Such innovation, though, may not lead to sustainable development as long as consumption continues to increase. For example, the OECD (2002a) reported that in the Netherlands electricity consumption increased by 14% between 1974 and 1994 despite significant efficiency improvements in many appliances. This suggests that technological improvements will not suffice and there is a need to slow the rate at which raw materials are transformed into products and eventually discarded, a process that has been described as "slow consumption" (Ax 2001).

Two international initiatives have provided signs of a significant cultural shift in this direction. Recent discourse on slow consumption has been initiated through Slow Food, a social movement of critics of the fast food culture, which originated in Italy in 1986 and now claims 80,000 members in over 100 countries. Slow Food locates its philosophical origins in the 17th-century writings of Francesco Angelita, who considered slowness a virtue and, believing that all creatures bore messages from God, wrote a book about snails. Slow Food thus adopted a snail as its symbol, noting that the creature is "of slow motion, to educate us that being fast makes man inconsiderate and foolish" (Slow Food 2002). The slow concept is now being applied as a prefix in other contexts. Slow Cities is a network of towns and cities formed in 1999 with the aim of taking the speed and stress out of urban life. Arguing the benefits of a slower pace of life, Honoré (2004) proposes further applications in the context of work-life balance, medicine, and education.

A second initiative concerned with consumption and time is the Long Now Foundation. One of its directors, Stewart Brand, has argued that "Civilization is revving itself into a pathologically short attention span. The trend might be coming from the acceleration of technology, the short-horizon perspective of market-driven economics, the next-election perspective of democracies, or the distractions of personal multi-tasking. All are on the increase." He continues: "Some sort of balancing corrective to the short-sightedness is needed—some mechanism or myth which encourages the long view and the taking of long-term responsibility, where 'long-term' is measured at least in centuries" (Long Now Foundation 2002).

Based in the United States, the Long Now Foundation aims to change people's attitudes to time by developing tools to help them toward thinking, understanding, and acting responsibly over long periods. One such tool is a clock, described by Daniel Hillis as follows: "I would like to propose a large (think Stonehenge) mechanical clock, powered by seasonal temperature changes. It ticks once a year, bongs once a century, and the cuckoo comes out every millennium." It is hoped that this clock, now being developed, will attract widespread interest and become iconic, reframing the way people relate to time just as the first photographs of Earth from outer space are believed to have changed how many view life on this planet.

A New Model

The potential contribution of longer product life spans to the complementary roles of eco-efficiency and slow consumption in enabling progress toward sustainable consumption is demonstrated in a model presented below in preliminary form (figure 1). The slow consumption concept, it is recognized, requires further development; in the present context it means slowing the rate at which products are consumed (literally, "used up") by increasing their intrinsic durability and providing careful maintenance.

The model's starting point is that sustainable development needs to be driven by both efficiency and sufficiency (McLaren et al. 1998; Reisch 2001). The case for eco-efficiency—increased resource productivity that enables simultaneous progress toward economic and environmental goals—is increasingly accepted as a political imperative and widely supported by industry (Holliday et al. 2002). It may not adequately reduce the environmental impact of consumption however, as noted above, and thus there is a need to reduce the throughput of products and services. Indeed, reference in the Brundtland report's definition of sustainable development to meeting people's "needs" is an implicit recognition that environmental constraints require a parameter of sufficiency (WCED 1987).

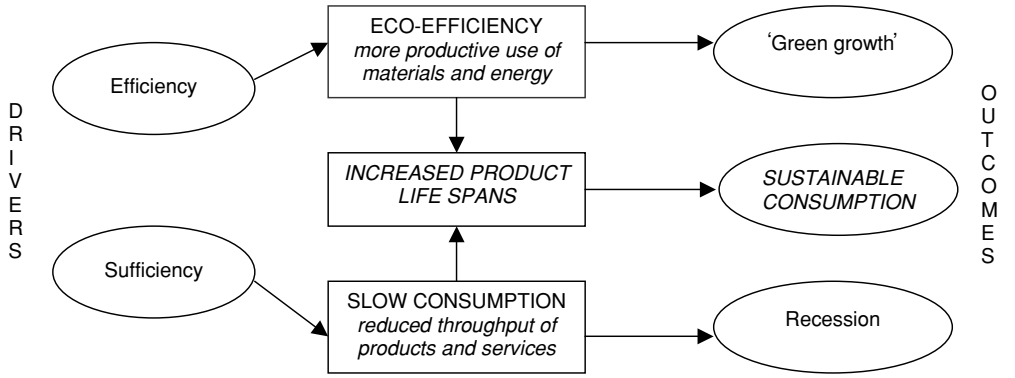

Figure 1 Product life spans and sustainable consumption.

As the model indicates, eco-efficiency, by itself, leads to "green growth." This is problematic if the environmental benefits gained from increased efficiency are offset by increased consumption through the rebound effect (Binswanger 2001).[3] The prospect of slow consumption will be similarly unappealing if reduced purchasing of short-life products by consumers raises a threat of unemployment and recession.

Increased product life spans, whether through greater intrinsic durability or better care and maintenance, may enable such problems to be overcome by providing for both efficiency and sufficiency. They are a means by which materials are used more productively (i.e., the same quantity provides a longer service) and throughput is slowed (i.e., products are replaced less frequently). Meanwhile a shift to more highly skilled, craft-based production methods and increased repair and maintenance work would provide employment opportunities to offset the effect of reduced demand for new products.

The model thus indicates that longer product life spans provide a route to sustainable consumption whereby reduced materials and energy throughput arising from eco-efficiency is not offset by increased consumption, and the economy remains healthy because products are carefully manufactured and maintained and there is less dependence on rising consumption for economic stability. In summary, this preliminary model, which simplifies a complex reality, suggests that longer-lasting products are a prerequisite for sustainable consumption.

Life-Cycle Thinking

If product life spans need to be increased in order to progress toward sustainable consumption, as suggested in the model above, the trend toward "life-cycle thinking" is highly relevant (e.g., Heiskanen 2002). Life-cycle thinking, a central premise of industrial ecology, sometimes described as a "cradle to grave" or "womb to tomb" approach, broadens the interest in consumption beyond the point of purchase to all phases in the life of a product, from its conception to final disposal. The origins of life-cycle thinking may be traced to the start of the 1970s, when growing awareness of the environmental impact of consumption began to generate commercial and political pressure for less damaging packaging, which led to attempts to measure the environmental impact of items systematically.

Life-cycle thinking from an environmental perspective considers the sequence of raw materials extraction, manufacturing, distribution, use, and disposal. An alternative approach is to follow the "consumption cycle" of prepurchase activities (e.g., problem recognition and information search), acquisition (or "purchase"), product use, and disposal (Antonides and van Raaij 1998). The long-established "product life cycle" concept of marketing theory is somewhat different but also relevant. In this context, the life cycle refers to the introduction of a product into the market, the development of sales, the process of product improvement, and the point at which the product is removed from the market. As manufacturers

	LIFE CYCLE PHASE				
IMPACT CATEGORY	Raw materials acquisition[1]	Manufacturing	Distribution	Use	Disposal
Resource consumption[2]					
Air emissions					
Water emissions					
Solid waste[3]					

Figure 2 Simplified LCA framework. [1]Including transportation and processing. [2]May be subdivided into energy and materials, or renewable and nonrenewable. [3]Industrial and postconsumer.

manage this sequence through, for example, innovation or stylistic change, there are obvious implications for product life spans.

This section of the article reviews recent literature in order to assess the significance of product life spans for life-cycle thinking and related tools, public policy, and professional practice in design and marketing. Recent research relating to product life spans is summarized in the section that follows.

Life-Cycle Assessment

One explanation for the emergence of life-cycle thinking is that distinguishing different phases in the life cycle of a product is necessary to enable environmental impacts (i.e., energy and materials, consumption, emissions to air and water, and waste) to be estimated. This framework, central in industrial ecology, results in a matrix of successive phases and types of impact (figure 2) that forms the basis for life-cycle assessment (LCA), an important tool for analyzing the environmental impact of products.

LCA is highly complex and fraught with difficulties concerning methodology and data collection (Baumann and Tillman 2004). Consequently it is often subject to criticism (e.g., Ayres 1995; Lee et al. 1995). Nonetheless its use has helped government and industry to determine appropriate standards (e.g., for eco-labeling), make product comparisons, verify environmental claims, and assess policy options. LCA may also benefit consumers directly by offering more reliable information on the environmental impact at each phase in the product's life cycle (Consumers International 1998).

Many LCAs undertaken by industry are not published and no recent studies that compare household products with different life span assumptions have been identified. Heiskanen (1996) found just one published LCA directly concerned with product life extension. This identified environmental benefits for household appliances, clothing, and furniture, though not for lighting and heating devices.

Although LCA may be useful in calculating environmental impacts, judgments still need to be made about the relative importance of different types of impact, such as whether lower energy use should be prioritized over reduced waste. One widely publicized example of LCA, a study of washing machines for the U.K. Ecolabelling Board, has sometimes been used to make the case against increased durability, because it concluded that 90% of the impact was in the use phase rather than in production, distribution, and disposal (Simon et al. 2001), with the implication that improved energy efficiency in use should be prioritized over life span considerations. Such outcomes have practical implications for public policy: Similar findings from research into refrigeration equipment resulted in subsidies being provided in Britain for low-income householders to replace inefficient old appliances.

Two further issues in LCA that relate specifically to raw materials extraction and product life spans should be noted. The first is methodological and concerns system boundaries. The washing machine LCA cited above was criticized because it did not include the impact of raw material extraction (Cooper 1994). Any variation in the life span of a product will affect usage of raw materials, which are often obtained from

sources in other countries. An increase in the life span of products in one country may thus reduce environmental impacts in others, though at the same time the latter may face reduced earnings from exports.

The second concerns the assumptions made in LCA about product life spans. The quality of LCA depends on sound data and, because the length of a product's life is a key variable, results will be questionable unless the life span assumptions used are transparent and correct, and the unit of measurement is appropriate (e.g., "replacement life" may well differ from "service life") (Cooper 1994).[4] It is significant, therefore, that there is longstanding concern about the inadequacy of data on product life spans: the washing machine LCA assumed an average life span to be 14 years, well above other published estimates (e.g., Cooper and Mayers 2000; OECD 1982).

Designing for Longevity

Life-cycle thinking is critical to design. Until the middle of the 20th century consumer durables were generally viewed as investments and, within reasonable cost boundaries, were designed to last as long as possible. Since then, however, planned obsolescence, the deliberate curtailment of a product's life span, has become commonplace, driven by, for example, a need for cost reductions in order to meet "price points," the convenience of disposability, and the appeal of fashion (Cooper 2004).

Designers are increasingly encouraged to take account of environmental and social considerations (Papanek 1984; Whiteley 1993). The initial approach took the form of "design for environment" (Fiksel 1996) (or "ecodesign"), whereas more recently a broader perspective, sustainable product design, has taken root (Charter and Tischner 2001).

An international network of designers interested in the sociocultural and psychological influences upon product life spans, Eternally Yours, has been established out of concern that products are often discarded not because they are worn out, but because people are tired of them. Originating almost a decade ago in the Netherlands, Eternally Yours has spearheaded discussion on "product endurance" (van Hinte 1997). It most recent initiative, a conference entitled Time In Design, reflected a desire to divert attention away from exclusive focus on the moment of product realization or purchase and instead to trace the usage of products with reference to product "careers" and "biographies" and wider cultural trends in consumption. Designers' interest in life-cycle thinking is partly being driven by public policy, reflecting a need to reduce waste, but also by their desire to improve understanding of products in terms of how carefully, intensively, and intimately they are used.

The need to explore product durability and product life extension in the context of sustainable technology has been recognized in Britain by the Engineering and Physical Sciences Research Council (EPSRC), a government funding agency that recently approved funding for a Network on Product Life Spans. This followed a multidisciplinary seminar on product life spans at which participants, mostly designers, expressed an interest in exploring further the complex issues raised (Cooper 2003).

One example is whether "design for durability" is appropriate in the context of technological advance that reduces other environmental impacts. Thus, whereas manufacturers have reduced water and energy use and increased the proportion of recycled materials used in products, they have not improved product durability (Consumers International 1998). The benefits of technological innovation leads some academics to view obsolescence positively, arguing that increased durability would lock society into a stock of products inefficient in their use of energy (Fishman et al. 1993). Heiskanen (1996), by contrast, warns of the downside of updating appliances prematurely. She argues that as long as innovation continues, delaying replacement will enable the purchase of appliances that are more energy-efficient. This is a view supported by Consumers International (1998).

Production and Product Life

The trend toward life-cycle thinking has important implications for industry (Westkämper et al. 2000). For example, rising levels of waste have led to legislation in the European Union directed at the "end-of-life" phase of products.

This is based on the "extended producer responsibility" (EPR) principle because of industry's prime role in designing and marketing products. As a consequence, manufacturers, some of whom previously knew little about the fate of their products after the initial guarantee had expired, have taken a greater interest in the knowledge that legislation such as the Waste Electrical and Electronic Equipment Directive and the End-of-Life Vehicles Directive makes them responsible for discarded items (Lifset 1993; Mayers and France 1999). Manufacturers of other consumer durables anticipate that they, too, may become subject to extended producer responsibility legislation.

If manufacturers become responsible for products at "end of life" as well as at the start (through consumer protection and other sales-related legislation), they may see benefits in tracking their products throughout the entire life span. Already some are exploring technical options for monitoring how household appliances are used during their life spans through the development of self-contained data acquisition units capable of communicating information back to suppliers (Klausner et al. 1998; Saar and Thomas 2002; Simon et al. 2001). Such devices would enable manufacturers to obtain better data on failure modes and frequencies and thus improve product reliability and servicing, gain knowledge about user behavior to aid marketing, and acquire product use and servicing histories in order to enable appropriate reuse of parts at the point of discard.

Another possibility is that manufacturers may review the potential for leasing products rather than selling them, and choose to sell services as distinct from products (Fishbein et al. 2000). This has long been proposed by advocates of product-service systems, defined as "a marketable set of products and services capable of jointly fulfilling a user's needs" (Goedkoop et al. 1999), and would represent a move from today's "fast replacement system" to the "optimal utilization" of products, characterized by an extension of their life spans (Stahel and Jackson 1993).

Life-cycle thinking could also lead to prices reflecting costs more rationally at successive phases in a product's life. At present, consumers are able to acquire and discard products relatively cheaply because the costs of waste disposal are externalized. In other words, these costs are not borne directly by those who acquire and discard products but more generally by local taxpayers (although there is growing political pressure for "pay as you throw" schemes). In addition, consumers appear to underestimate energy costs and overestimate repair costs. The most influential factor in purchasing decisions is typically price, and Kollman (1992) found that consumers were often unaware that a significant proportion of the overall cost of appliances arises from energy consumption and repair work during the use phase. On the other hand, the incidence of appliance failure has fallen due to improved reliability, and the U.K. Office of Fair Trading (2002) and the U. K. Competition Commission (2003) recently concluded that extended warranties, which consumers purchase to protect themselves against repair costs, are overpriced.

Like manufacturers, consumers need to become better informed about product life-cycle issues. Consumers International (1998) reported that consumer organizations, when offering advice, tend not to address issues that arise during later phases in the life cycle such as the repairing, upgrading, or recycling of appliances and the timing of replacements. It recommended that they should, in future, analyze the optimal life spans of appliances, explore the potential for upgrading, and pay greater attention to after-sales services.

Product Life Span Research

The introductory section proposed a model that suggested that increasing product life spans, by combining greater resource productivity with slower throughput, provides an important mechanism for progressing toward sustainable consumption. Such a strategy would require an extensive body of knowledge about product life spans. This section summarizes the findings of recent research on product life spans and, more specifically, consumers' attitudes and behavior at different stages in the product life cycle.

Data on Life Spans

Despite an increase in environmental research relating to household consumption (Lorek and Spangenberg 2001; Noorman and Uiterkamp 1998; OECD 2002a; SusHouse 2002), there has

Table 1 Ages of discarded appliances

Product category	*Mean age of products discarded in United Kingdom, 1993–1998.*
Electric cookers	12
Refrigerators and freezers	11
Televisions	10
Washing machines, dishwashers, and tumble dryers	9
Hi-fi and stereo	9
Vacuum cleaners and carpet cleaners	8
Video equipment	7
Home and garden tools	7
Microwave ovens	7
Computers and peripherals	6
Telephones, faxes, and answering machines	6
Radio and personal radio, stereo, and CD	6
Small work or personal care appliances	4
Mobile phones and pagers	4
Toys	4

Source: Cooper and Mayers (2000).

been no comprehensive publicly funded study of product life spans since an OECD report over 20 years ago (OECD 1982). Life span data have long been regarded as inadequate (Antonides 1990; Conn 1977; Cooper 1994; OECD 1982). According to Bayus (1998, p. 764), "Empirically, it is very difficult to rigorously examine product lifetimes, since detailed data for the entire product life-cycle and at all the various product market levels are generally difficult to acquire." In recent years there have been policy reviews of durability as a waste reduction strategy (Cooper 1994) and "environmental product strategy" (Heiskanen 1996), a book on marketing longer-lasting products (Kostecki 1998), empirical and theoretical literature on second hand markets (Gregson and Crewe 2003; Thomas 2003), a summary by Stahel (2003) of his extensive work on product utilization and the service economy, and two design-focused doctoral studies (Chalkley 2003; van Nes 2003). Overall, however, the research base remains weak.

The most substantive published findings on product life spans are from E-SCOPE, a research project on household appliances undertaken in the United Kingdom that generated data through a quantitative survey of over 800 households in 1998 and a series of focus groups in 1999. Data collected included expectations for appliance life spans, the age and condition of discarded appliances, the means by which they are discarded, factors that deter consumers from purchasing longer-lasting appliances, and attitudes and behavior relating to repair (Cooper and Mayers 2000). Some key findings are discussed below; the research has been reported more fully elsewhere (Cooper 2004).

The quantitative survey revealed that the average life span of discarded appliances ranged from 4 to 12 years, depending on type (table 1). It also found the stock of appliances in people's homes to be young, partly reflecting a growth in possessions. More than half (57%) were less than 5 years old and nearly nine in ten (88%) were under 10 years old.

Although some academics have argued that product life spans have declined (e.g., Kostecki 1998), Bayus (1998) was more skeptical. The lack of historical data has led to a dependence on anecdotal evidence. Public opinion inclines toward the belief that life spans have declined. In the E-SCOPE focus group discussions, most contributors argued that appliances, particularly small items, do not last as long as in the past. A typical comment was: "Things have changed. I think they are made more disposable these days . . .

Things used to last a lot longer" (Cooper and Mayers 2000, p. 13).

Consumer Attitudes and Behavior

The E-SCOPE survey asked householders about their attitudes to product life spans. This revealed that the U.K. population is divided, almost evenly, on whether or not appliances last long enough: 45% responded that they do not, whereas 50% stated that they do (the remaining 5% expressed no opinion). People's opinions appeared to be reflected by their behavior. Those who were satisfied with product life spans were significantly more likely to purchase premium-range appliances and attempt to get products repaired.

Asked how long appliances should last, householders revealed expectations that appeared realistic but not quite fulfilled. The average age of discarded appliances was just below the age considered "reasonable". One focus group participant hinted at an apparently innate desire for improvement: "I don't think they ever last as long as you'd like" (Cooper and Mayers 2000, p. 13). A small proportion of householders had markedly higher expectations: for example, more than 10% thought that cookers (i.e., ranges), refrigerators and freezers, hi-fis and stereos, telephones, and home and garden tools should last at least 20 years. No other academic data have been identified on consumer expectations of product life spans. Nor does any market research in the public domain include such data, although the importance of durability is sometimes implied in questions about quality and reliability.

Concerning acquisition, the E-SCOPE questionnaire asked householders to identify the disadvantages of purchasing longer-lasting appliances. The results revealed that more respondents were deterred by a fear that such items would become "out of date" (30%) than by price (23%). Men were significantly more concerned about advancing technology than women, who were more price-conscious. The focus groups explored different interpretations of "out of date." One participant said that a reconditioned case would be acceptable but working parts should be new, whereas another considered reconditioned inner parts acceptable as long as the case was new!

Many consumers evidently want better information at the point of sale about the intended life spans of products. Some 73% considered information on the expected life spans of appliances to be "very important," whereas 54% were dissatisfied with those currently available. New research suggests that few consumer durables are labeled with their intended life spans, although eco-labels and other quality labels provide signals, as may the length of guarantees, advertising claims, price, brand reputation, and industry standards (Christer and Cooper 2004).

Recent research concluded that repair work has declined in the U.K., in part because labor costs are high, while manufacturing has increasingly relocated to countries with low costs (Cooper 2005). The E-SCOPE survey found that one-third of discarded appliances were still functional and of those that were broken, a third were classified as "in need of repair" as distinct from "broken beyond repair." The responses are based on subjective judgments, but suggest that trading up is common and people often replace broken appliances that they consider reparable. This conclusion is reinforced by another research study, which assessed the condition of bulky items discarded at civic amenity sites (local authority facilities for bulky household waste) and concluded that 77% of upholstered furniture and 60% of domestic appliances could theoretically be refurbished and reused (Anderson 1999).

The increasing cost of repair relative to replacement exerts an important influence upon user behavior. In the E-SCOPE survey almost four in ten respondents (38%) reported that they rarely or never had appliances repaired, and over two-thirds (68%) cited cost as a factor that discouraged them. A study in Finland showed that from 1981 to 1994 the price of new televisions increased by 20%, whereas the cost of repair work rose by over 150%; the figures for washing machines were 40% and 165%, respectively (Consumers International 1998, p. 20). Recent research concluded that repair work has declined in the United Kingdom because labor costs are high, whereas manufacturing is increasingly relocated to countries with low costs (Cooper 2004). This relocation also leads to the loss of workers skilled enough to be employed in repair workshops. The regulatory climate is a

further factor that may have dissuaded consumers from undertaking repair work. The ECLG (1988) criticized a lack of information on the durability of goods accessible to consumers and a lack of transparency in the after-sales service market, which led to inadequate price competition. Its report also argued that consumers were often victims of legal uncertainty concerning unsuccessful repair work.

Finally, the E-SCOPE survey found that most householders, when replacing functional appliances, want to see them utilized rather than disposed of as waste. Consequently many appliances have more than one owner during their life spans. Almost one-quarter of all discarded appliances (24%) were donated or sold and the reuse of computers (67%), hi-fi and stereo (44%), and video equipment, microwave ovens, and toys (around 35% in each case) was particularly high. Focus group participants were asked about their view of second-hand appliances, which account for approximately 5% of the total stock. Attitudes were generally negative, although some people expressed a willingness to purchase them if they offered good value and were sold with adequate guarantees.

The E-SCOPE project was followed by a study of consumers' attitudes and behavior relating to product life spans for other types of consumer durables, footwear, and upholstered chairs as well as kitchen appliances (Evans and Cooper 2003). This research, based on a survey of 711 householders in Sheffield, United Kingdom in 2000 and a series of in-depth interviews in 2002, explored consumers' intentions and behavior during successive phases in the consumption cycle (acquisition, use, discard) for each of the three types of product.

The study concluded that most people do not adopt a consistent approach toward product life spans. In each of the three phases some behaved in such a way as to encourage a long life span, such as making durability a priority at acquisition, taking good care of the product during use, or ensuring reuse if it still functioned when discarded. Only a very few people, however, exhibited such behavior in all three phases. Moreover, the research found that most people did not have the intention of behaving in such a way that products have long life spans. Even among those that did, their actual behavior during the use phase was often not consistent with their intentions. Footwear, for example, was infrequently cleaned.

Market Conditions

These research findings reveal a population divided in its response to appliance life spans. Although some consumers evidently do not favor longer-lasting products, what is known about the ability of the market to meet the needs of those who do? This question is addressed below using a framework developed by Eternally Yours that distinguishes product characteristics ("shapes and surfaces"), people's relationships with products and other people ("signs and scripts"), and the operational system or context ("sales and services").

Shapes and Surfaces

Examples of high-quality products that are intended to have long life spans are available for most types of product. Products, when designed, are subject to technical specifications that determine intrinsic qualities such as resistance to abrasion and wear, reliability, repairability, and upgradeability. Those that are designed for durability are constructed robustly, the materials used are of the highest quality, they are carefully assembled, and their design makes them easy to repair because components and parts are readily accessible (Cramer 1997; Park 2003). The quality of any internal operating mechanisms, such as circuit boards or motors, critically influences their reliability and, ultimately, their durability.

The outer form of products often affects their life span, and sometimes in a way that is less obvious or predictable. The way in which a product's surface wears is important; wood, for example, tends to age better than plastic. Products should "age with dignity" (van Hinte 1997). In other words, aesthetic appeal may underpin longevity.

People may be attracted to a product in response to particular geometrical characteristics, style or features, or signs of meticulous care for quality and detail, as in handcrafted products. Ax (2001) provides an example of the latter in a case study of handcrafted shoes. These represent sustainable product design (cf. ecodesign) because there is a social dimension: production is invariably localized, supporting regional

development. Ax argues that mass-produced shoes are often cheap and irrepairable and concludes that handcrafted shoes are more likely to be repaired because they will be comfortable and attractive. More generally, the involvement of customers in the production process will make them appreciate products more and want to use them for a long time, a manifestation of slow consumption.

Signs and Scripts

Products are not merely functional objects, but convey important signals in human relationships. Our possessions communicate messages about who we are, or want to be, and tell stories about our past life.[5] They convey meaning, reflect values, and contribute to human identity. A decision to replace a product, for example, may signify to others that we do not want to be associated with an item regarded as out of date. Conversely, we may feel increased attachment to a product over time through familiarity, or the special circumstances in which it was obtained.

Markets often provide negative signals about attachment to products. This is not surprising, because one aim of advertising is to entice people to renew their possessions. Packard (1960, 74) cites a clothing retailer: "We must accelerate obsolescence . . . It is our job to make women unhappy with what they have." Current media interest in "clutter" provides a more ambiguous message. Techniques for disposing of clutter are the latest life management tool, with consultancy firms offering one-to-one advice by e-mail and television series providing advice to families seeking to be rid of clutter. It is not always clear whether the motive is to progress toward sufficiency or to make space to update possessions.

If sustainable consumption requires products to last longer, owners may need to develop greater attachment to their possessions and no longer aspire to update them as soon as new models appear on the market. It is uncertain, however, how many products it is possible for people to feel affection toward. During the Eternally Yours Congress, a parallel was drawn with human relationships. If people can only love their "life partners" uniquely and their families and a few friends with special affection, perhaps similarly they cannot be expected to care deeply for all of their possessions (van Hinte 1997).

People appear increasingly unwilling to take long-term care of possessions through repair and maintenance and are, at best, inconsistent in their behavior (Cooper and Mayers 2000; Evans and Cooper 2003). By contrast, Manzini (1993, 377) writes, "Emerging from the throw-away world means questioning the idea that the objective to be attained in our relationship with things should always be to strive for minimum effort and minimum attention and proposing, alternatively, that what should be sought is maximum quality, which may even necessitate paying more attention to things and taking greater care of them." This, he continues (384), "means overcoming the idea that they are machines at our service or images to be consumed." Instead, they require the "affective attention" of owners, which, in conflict with the ultrafast tempo of the throwaway world, requires the creation of "islands of slowness" in which people make time to care for things and for other people.

Sales and Services

If product life spans are to increase, new marketing strategies must be developed. Products designed for longevity tend to be relatively expensive and often account for a small share of the market. This partly reflects consumers' priorities, but in addition it is not always easy for consumers to identify products designed for long life spans (Christer and Cooper 2004). Brand is not necessarily an adequate guide, because a brand might be reliable for one type of appliance but not another (Which? Online 2001). Nor are price and quality always closely related (Alpert et al. 1993). In a case study of a company specializing in durable, craft-made products, Burchardt (2001) concluded that customers are often unable to make informed judgments on the price/performance ratios of products, and that decisions to opt for higher-priced items are consequently dependent on trust rather than knowledge. Improved information on the durability aspects of products, as proposed by Consumers International (1998) and Christer and Cooper (2004), appears necessary if the market share of longer-lasting products is to

expand. In addition, ecological tax reform, switching taxes from employment to energy and materials, could help to make repair and maintenance more economically attractive compared with replacement.

A more dramatic change in marketing strategy would be from selling product "hardware" to selling the services that products provide (White et al. 1999; Reiskin et al. 1999; Cooper and Evans 2000; Manzini and Vezzoli 2002; Behrendt et al. 2003). Such a change in the product-service mix has been proposed on the grounds that it may increase resource efficiency. Two types of product-service system are of particular relevance to product durability.

One is when value is added to the life cycle of a product through, for example, improved after-sales services. In Britain and many other industrial countries the market for repair and maintenance services is variable in quality and the trend in product sectors such as footwear and small appliances is one of long-term decline (Cooper 2005). Extended warranties not only are expensive, as noted above, but do not reflect the actual risk of failure for individual brands and models (Office of Fair Trading 2002). Policy suggestions to improve after-sales services have included designing products for ease of repair, longer guarantees, more cost-effective warranties, improving the availability and pricing of spare parts, and ensuring that charges for repair work are transparent and justified (Consumers International 1998; Cooper 1994; ECLG 1988; OECD 1982).

A second takes the form of an "enabling platform" for consumers to receive a service without having to purchase a product, examples being renting tools, car sharing, or using a launderette. This allows products to be used more intensively, which reduces the number in circulation and the use of old, inefficient models, and removes a supplier's incentive to curtail life spans. Oosterhuis and colleagues (1996) advocate a shift from retail sales to "eco-leasing," in which suppliers assume responsibility for maintaining and disposing of products. This is suited to extended producer responsibility legislation, because it enables suppliers to keep track of products throughout the life cycle. It would, however, require a dramatic change in the corporate culture of "shifting boxes."

Research Needs

The OECD (2002b) recently concluded that the process of decision making by firms and households concerning the design, production, use, and disposal of consumer durables is not well understood. More specifically, new interest in life-cycle thinking has revealed a lack of knowledge relating to the length of product life spans. This review of research into product life spans and the current ability of markets to supply longer-lasting products demonstrates a need for more research. The following themes are suggested as priorities:

- First, there is a need for *life span data* on a wider range of consumer durables. Some data on household appliances are now available, but no equivalent data have been published on other consumer durables such as furniture, floor coverings, photographic and optical goods, household utensils and tools, or semidurable goods such as clothing, footwear, and textiles.
- The *environmental case* for and against increased product life span needs to be better understood. For example, more information is needed on the extent to which longer-lasting products would reduce the throughput of materials in the economy. Consumers currently appear to associate durability with quality more than with environmental benefits. One way of increasing public awareness would be to undertake life-cycle assessments of products with different life spans and publish the findings.
- The relationship between *market conditions* and product life spans is important. Greater knowledge is needed of the ability of manufacturers to specify the design life of products accurately and the extent to which consumers take durability into account when making purchases. The factors that determine the market share of premium-range products should be explored, with reference to the long-established debate on the price/quality relationship.
- A deeper exploration of *consumer values and attitudes* is needed to understand how people might reduce their desire to acquire more

possessions and, instead, increase their attachment to those that they currently own.
- A review and assessment should be made of *life span extension strategies*, such as identifying incentives to producers and consumers that might encourage repair work.
- Finally, further *theoretical and empirical research* on obsolescence in different product sectors is needed to evaluate the relative importance of economic, technological, and psychological influences. The role of different stakeholders also needs to be analyzed, and the institutional and sociocultural dimensions of obsolescence needs to be explored.

Conclusions

Public commitment to the changes required if the throwaway culture is to be superseded remains unconvincing. A need to increase resource productivity is accepted, but politicians currently address this in the context of efficiency, apparently wary of advocating policies that might be portrayed as a threat to contemporary lifestyles. Prompted by quality of life concerns, the relationship between consumption and time has increasingly attracted research interest and a countercultural phenomenon, "slow consumption," has surfaced.

This article has proposed a preliminary model to demonstrate that sustainable consumption requires increased product life spans because, to secure an adequate reduction in environmental impacts, a reduced throughput of products and services is needed as well as a more productive use of materials and energy.

Life-cycle thinking is of considerable importance to designers, manufacturers, and consumers in responding to the challenge of sustainable consumption. Academic study of consumer behavior, which emerged in a marketing context, has focussed on the purchase phase in the product life cycle, but understanding the subsequent phases of use and disposal is increasingly vital. Life-cycle thinking is already used practically in tools such as life-cycle assessment to measure the environmental impact of products. Such tools require life span data, however, which are not always available.

British research on public attitudes to the product life span of household appliances has revealed a population divided between the satisfied and the discontented. Evidence of inconsistent behavior suggests that product life spans are often not optimized. Measures are needed to promote the design of products with increased durability to encourage owners to take good care of their possessions and to provide greater market incentives for longer-lasting products.

Despite long-established criticism of the throwaway society, there remains a lack of scholarly research on the subject. Improved theoretical understanding and empirical data are required. Interest in product life spans, however, is growing. Although the throwaway society still prevails, signs have appeared of an emerging cultural critique of consumption patterns that, too often, have been characterized by excess speed and shortsightedness.

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Notes

1. There is, however, a significant body of economics literature investigating market circumstances in which companies might have an incentive to reduce product durability to a level that is socially suboptimal. Much of this is based on unrealistic theoretical assumptions relating to a monopoly situation or perfect competition, although, as Waldman (2003) notes, there have been some notable recent advances in developing theory for durable goods in "real world" markets.
2. *Editor's note:* For an analysis of the role of time in consumption issues, see the article by Jalas (2005) in this issue.
3. *Editor's note:* For a discussion of the rebound effect as it relates to sustainable consumption, see the article by Hertwich (2005) in this issue.
4. Replacement life is the period from a consumer's initial purchase to the purchase of a replacement. Service life is the period from an initial purchase to disposal by the final user. The periods differ

according to whether the original purchaser sells or gives the product to another person prior to its final disposal.

5. *Editor's note:* For a detailed discussion of symbolic and other nonfunctional roles of products, see the article by Jackson (2005) in this special issue.

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