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Consumers' reactions to product obsolescence in emerging markets:

The case of Brazil

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Abstract

Product obsolescence in the household appliances and electronics segments represents a major challenge for building sustainable development. Both the deliberate curtailment of product life span and the de-stabilization of product symbolic appeal which lays the ground for psychological obsolescence, the volume of e-waste have grown exponentially amplifying its social, economic and environmental effects. In the case of emerging markets, the combination of widespread social mobility and purchase power gains by lower classes together with poor waste management infrastructure and poor regulation of corporate performance aggravates results. Despite the importance of both negative (eg consumerism, pollution, inflation) and positive (eg innovation, economic growth) consequences of product obsolescence, little research has been conducted on the topic of appliances longevity and, mostly, it has referred to the context of highly developed nations (Cooper, 2004; 2005; Guiltinan, 2009; Cox et al., 2013). Moreover, research has tended to overlook attitudes and perceptions towards corporate behavior regarding product lifetime. This paper aims to illustrate consumers' perceptions of appliances and electronics product life spans and to understand consumers' reactions to product obsolescence in an emerging country: Brazil. It reflects a research partnership between a market research agency and IDEC (the leading consumers' advocacy organization in Brazil) in order to improve educational campaigns, enlighten the debate on the subject, and provide information for future policy initiatives. Studying Brazil is relevant given its emblematic standing as the most resounding contemporary case of social mobility and consumerism in the Western hemisphere, with nearly 50 million leaving poverty to middle class status during the late 2000s (World Bank, 2012). Consequences of such drive include the highest per capita e-waste rate among developing nations (average 0.8 kgs/year, cf. World Bank, 2012). Furthermore, the country upholds one of the most progressive legislation on solid waste management in the pack of emerging societies (PNRS, 2010), although weakly enforced (Visser and Tolhurst, 2010). Research is based upon telephone interviews with an urban representative sample with 806 adult (aged 18-69 years old) living in the largest 9 capital cities of Brazil. Evidence indicates that product lifespan experience has shortened overtime and trails expectations but that does not fuel dissatisfaction in the expected magnitude. Technical failure is less a cause for product replacement than rapid devaluation of symbolic features associated to device, which reflects the weight of psychological obsolescence. Individuals acknowledge corporate strategy behind patterns of rapid product replacement but this seems insufficient basis for condemning manufacturers. We conclude that Brazilians naturalize obsolescence by adjusting downwardly their product lifespan management behaviors.

Palavras-chave: Planned obsolescence, eletronic waste, Brazil.

1- Introduction

Waste reduction has become one of the central challenges towards a more sustainable society (OECD, 2011). Electronic waste (e.g., e-waste) in particular accounts for a large part of the problem as it is growing

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faster than any other waste stream as a result of an ever-expanding electronics market and the rising obsolescence rate of electronics equipment (World Bank, 2012).

Emerging economies like Brazil hosting a burgeoning middle class with long-delayed consumer aspirations (Ferreira et. al., 2012; Tabion, 2010) bear increasing responsibility for the rise in e-waste. Market estimates point Brazil's e-waste in excess of 1m ton annually (ABDI, 2013) and it is expected to hit the 1.2m ton in 2016 – a prognosis deemed conservative once the segments of electronic household devices, mobile handsets, and computer equipment have exhibited double-digit growth rates per year (ABINEE, 2013). Currently, the e-waste volume increases three times faster than regular waste and, among developing nations, Brazil stands out with the highest per capita e-waste rate (0.8 kg) as projected for 2015 (World Bank, 2012). Given that less than 60% of total waste is adequately disposed in authorized landfills and only 4% of total waste is actually recycled (World Bank, 2012) the implications of waste generation in Brazil are enormous.

Policy waste management and regulation (falling under the umbrella National Plan for Solid Waste set in motion in late 2010) as well as trade initiatives have been taken recently aiming at accomplishing extended manufacturers' responsibility for the entire lifecycle of products, yet little attention has been directed to stimulating a more responsible approach to products lifespan and cost-effective alternatives for product repairs or defective parts replacement. Public policy and grassroots mobilization from pressure movements like consumer associations chose to highlight waste management issues like reverse logistics, recycling, adequate disposal infrastructure and take-back schemes embedded in extended producer responsibility (that is, once waste is already generated). Initiatives about waste prevention and generation through dematerialization and throughput reduction have been grossly ignored. Accordingly, producers' deliberate curtailment of product lifetime and their marketing and advertising campaigns that hasten symbolic devaluation of products and induce to their replacement regardless usability have been bypassed.

Likewise, consumer awareness and responsibility for e-waste generation resulting from psychological obsolescence have been overlooked. Mass media have echoed this bias by overemphasizing producer responsibility at the end of the product cycle through recycling or ecofriendly discarding of waste, and missing a debate around longer-lasting and repairable appliances. Academic scholarship has also overlooked the analysis of product symbolic obsolescence and precocious replacement practices among consumers. The pivotal role granted to consumers in promoting sustainable consumption solutions (Jackson, 2005; Mont and Power, 2009) has thus remained neglected with regards to waste generation and reduction. The bulk of the literature considerations about the role of consumers have been related to their responsibilities for waste disposal and recycling (that is, waste management), not about their influence over waste generation. As a result, the study of consumers influence over product longevity remains underdeveloped (Evans and Cooper, 2010). The least we understand the public's views about product obsolescence, the lower the chances of

attaining absolute reductions towards a sustainable future by means of a net disposal decline through longer product durability leveraged by consumers.

Greater product longevity has been pointed out as one of the most obvious strategies for reducing waste and increasing material productivity (Von Weizsacker et al., 1997). Instead, the debate around reverting shortened lifecycles has focused on alternatives like remanufacturing (King et al., 2006). Shorter lifespans have been usually defended on grounds of promoting technological innovation, business growth, and healthy economics (Fishman et al., 1993); on the other hand, these occurrences have been linked to negative environmental consequences like resource depletion, pollution, and greenhouse gas emissions (Cooper, 2005; Guiltinan, 2009). Moreover, rapid product replacement has also negative economic side-effects as governments are forced to distract larger resources for waste management through expanding garbage collection systems and landfills acquisition and development, society gets exposed to a rapidly growing number of toxic materials from non-recycled materials putting pressure on health spending and labor productivity, and the continued demand for increasingly scarce natural resources to manufacture replacement products ends up pushing commodity prices up, thus boosting inflation and economic instability.

Interestingly, positive and negative assessments of product obsolescence coalesce in attributing this outcome to manufacturers planned decisions and interpreting the issue from an instrumental and consequentialist perspective –in other words, planned obsolescence becomes a tool for technological progress or environmental harms (Fishman et al., 1993; Cooper, 2005; Guiltinan, 2009). Consumers have been ultimately exonerated from any role in rapid product churn whereas subjective obsolescence has been mostly interpreted as the expression of engineered product decay induced by manufacturers' institutionalized practices (Peattie, 2010; Spinney et al., 2012). As nicely synthesized by Guiltinan (2009:20): “the most direct way to speed replacement demand is to shorten the usable life of a product... (in that sense) the objective of planned obsolescence is to stimulate replacement buying by consumers”. In sum, product obsolescence takes the form of both device functional inoperability and product symbolic devaluation along with the requalification of existing product categories by producers (Cooper, 2004; Peattie, 2010; Spinney et al., 2012). The prevailing view is that consumers are either manipulated to rapidly nurture feelings of subjective outmodedness for acquired products or remained locked in into situations they cannot control or they refuse to endorse. As a result, consumer perceptions and behaviors have been mostly overlooked once the previously described perspectives rendered them pointless and immaterial to properly understand the underlying dynamics conducive to shortened lifespan of products. We understand that by obliterating knowledge about consumer dispositions and denying agency to consumers as a key player of the entire product lifecycle, the opportunities for identifying policy and behavioral touch-points with manufacturers and consumers to promote change and square obsolescence-driven e-waste problems have been seriously impaired.

2- Research on product longevity and obsolescence

The scant empirical scholarship on the subject presupposed a generic consumer adherence to product longevity yet it has found that consumers are divided on whether appliances lifespans are adequate. This ambiguity even applies to devices more strongly impacted by technology developments (like mobile phones and personal care appliances) whose expected as reasonable lifespan substantially exceeded the actual experienced lifespan (e.g., 2 years more or 1/3 of extra time in use) (Cooper, 2004). Interestingly, qualitative research uncovered a perception of declining durability with occasional recognition of an intentional lifespan reduction by manufacturers pushed by decreased reliability and continuously added functions (Cooper, 2004: 431; 433-435). Nevertheless, this opinion is far from undisputed and it seems that consumers self-address this imbalance by lowering their product lifespan expectations (Evans and Cooper, 2010), thus reducing the resulting cognitive dissonance. This finding is consistent with evidence that technical durability is not perceived as a problem (Evans and Cooper, 2010) and with the weak role of product longevity as an influencing feature in consumer choice (Cooper, 2004; Cox et al., 2013).

Product lifespan is also deprived of environmental implications in the eyes of consumers, being mostly understood as a quality issue (Cooper, 2004; 2005; Cox et al., 2013). Environmental views, beliefs about waste reduction and recycling appear disconnected from perceived product lifespan (Cooper, 2004). The consumer disconnection of product longevity and environmental concerns represents a warning signal for policy efforts aiming at the accomplishment of sustainable consumption goals. Such perception seems to reflect the existing gap between green beliefs and green behaviors (Auger and Devinney, 2007; Kollmuss and Agyeman, 2002; Jackson, 2005) wherein knowledge deficits hinder awareness of the environmental implications of consumer choices. Even more importantly, it illustrates deficits of perceived behavioral control expressed in responsibility self-exoneration, an ambiguous sense of subjective competence in relation to this issue, and the responsibility attribution to manufacturers for providing an environmentally sound supply (Guiltinan, 2009).

Research suggest that consumers often replace products in response to fashion and new technology rather than as a result of performance collapse beyond repair (Cooper, 2004; Evans and Cooper, 2010; Cox et al., 2013), signaling the weight of psychological or symbolic obsolescence. In the UK, for example, 1/3 of appliances were discarded while still functional and another 1/5 demanded only some repair for proper functioning (Cooper, 2004). Concomitantly, research has proven that the interval for unforced substitution decisions driven by psychological obsolescence expressions (such as fashion and technical upgrading incompatible with older device models) has been shorter than replacement decisions resulting from “forced”, physical obsolescence reasons (Grewal et al., 2004).

Furthermore, the lack of association between the perceived quality of appliances and the expected product longevity indicates that functional features are rather peripheral to usage and disposal practices (Cooper, 2004). Equally important, longer durability was related to few disadvantages such as products becoming

outdated and embodying a negative cost-benefit balance as affordability of new ones increases (Cooper, 2004). In making sense of the underlying rationality behind considerations unconstrained by functional reasons, scholars recognized the influence of socio-emotional or psychological forces such as consumerism, time famine, and periodic possession actualization (Evans and Cooper, 2010; Cox et al., 2013). The ultimate status of those arguments as residual explanations is congruent with the lack of empirical research in e-waste discussions about the role of consumers in the assimilation of symbolic obsolescence and consumer reconnaissance of manufacturers' deliberate curtailment of product lifetime.

The notion of psychological obsolescence can be related to consumer engagement with goods as means for identity and social interaction (Douglas and Isherwood, 1996). Material objects like electronics constitute signs and scripts for personal identity, enabling the accomplishment of core needs (such as belonging, transcendence, self-actualization, and distinction). That notion of psychological obsolescence takes for granted a declining subjective utility (social desirability) of products overtime as symbolic representations of status and character. Behind rapid devaluation of products' subjective worth pushed by technical innovations or rebranding efforts, several authors perceive an "organized creation of dissatisfaction" (Steele and Larson 1993) with styles and models turnover being a function of products declining appeal and desirability.

Some scholars exonerate consumers and relate this process nearly exclusively to manufacturers' destabilization of product qualities (Spinney et al., 2012). Such approach paves the road to interpreting consumers as locked in into situations beyond their control, which undermines the odds of instilling a sense of personal awareness, responsibility and efficacy for a different type of influence over product lifespan (Sanne, 2002; Jackson, 2005; Holt, 2012).

Consumers may, nonetheless, look less like victims than as willing accessory partners of this process. They eagerly validate technology innovation as a reason for product replacement and reveal no nostalgia for discarded appliances, a substantial share of which becomes e-waste even if still operational (Cooper, 2004; Cox et al., 2013). In other words, the potential benefits (either financial or environmental) of longer-lasting products may fail to appeal consumers and product-makers alike as long as the issue of psychological obsolescence remains overlooked, along with its effects upon consumer generated e-waste.

3- Research questions

These controversies clearly indicate the pivotal role of lifespan data and socio-psychological measurement of public's views about product obsolescence for ascertaining sustainability goals through reduced throughput (Cooper, 2010). This paper aims to understand perceptions of product lifespan, perceived value of product longevity, and attitudes and behaviors towards product obsolescence in the context of a developing society like Brazil characterized by a burgeoning middle class that has proved avid for consumer electronics. Since the success, and consequences, of planned obsolescence ultimately depend on consumer behavior in the marketplace it is essential to understand consumer perceptions and reactions towards

shortened durables replacement and disposal cycles, in order to base policy and grassroots mobilization about these issues on informed judgments. Given the economic and environmental weight of e-waste in this country, we direct our analysis to a selection of electronic appliances.

First, we seek to understand the consumer experience with product lifetime by surveying past and current product lifetime usage backgrounds, the degree of satisfaction with product longevity, the size of the gap between what is perceived as reasonable lifespan and the actual usage lifespan for these appliances, and the variation of expected longer lifespans across appliances. Moreover, we seek to describe actual behavior in relation to appliances disposal and reasons for replacement. Equally important, given the paucity of comparative data on these topics (most of which comes from developed countries), we will discuss findings in comparison with Cooper's (2004; 2005) results for the UK—thus illustrating similarities and divergences across different societies. These data will provide a context to subsequent research questions on attitudes and behaviors towards obsolescence.

Secondly, this paper will inform about the perceived value attributed to product durability, the acknowledgement of planned obsolescence and its effects upon personal life. To our knowledge this data will furnish the first portrait of consumers' perceptions of product obsolescence in developing societies from Latin America. It will also provide a descriptive picture of how locked-in or sovereign are e-waste generation behaviors. Equally important, it will enable to identify the extent to which manufacturers' planned obsolescence and individual symbolic obsolescence of products are acknowledged by consumers and in which ways these perceptions interact with consumer attitudes towards product longevity, motivations for disposal behavior, the claims used in favor and against incentivized product substitution, and environmental concerns.

This research aims to fill a gap in the understanding of consumer disposal behavior of e-products in emerging markets, which should contribute both for elucidating the extent to which current policy and regulation initiatives are in line with society practices, and for identifying the contents that may resonate more strongly with population upon which to focus educational and informational campaigns. In light of the lack of publicly available data on both product lifetimes and consumers' relationships with product lifespan and product obsolescence, this paper will mostly offer a descriptive, explorative account.

4- Methodology

The proposed discussion relies on survey data conducted upon an urban representative sample of 806 adult Brazilians, residents of the largest 9 state capital cities across all major regions², who were interviewed by telephone based on a random probability selection of landlines. Quotas of gender, class and age groups were applied at the level of respondent to ensure the sample match with population parameters. Cases across cities

² Cities included São Paulo, Rio de Janeiro, Belo Horizonte, Curitiba, Porto Alegre, Brasília, Goiânia, Salvador, and Recife.

were distributed proportional to population size, with larger cities like São Paulo and Rio concentrating a bigger share of total interviews. The data collection took place from August 30 to October 7, 2013 and sample estimates can be interpreted within a margin of error of $\pm 3.5\%$.

The questionnaire is structured in two sections. The first section seeks to understand individuals' usage and disposal experiences with appliances and their approach to product lifetime. We pose questions for ten different electronic appliances³ and collect responses only for those who have had one previous device. Qualifying subsamples vary from 91% (for mobile phone category) to 44% (for printer and microwave) of the originally contacted sample. Questions probe for the longevity of usage of previously owned devices and the useful lifespan reckoned as reasonable for each of them. The net difference of these average estimates provides a picture of the longevity gap as experienced by consumers. This first section also maps out disposal routines including seeking maintenance before substitution. We discuss findings based on frequency distributions and descriptive comparisons with similar data for the UK.

The second section explores attitudes and behaviors towards product longevity and obsolescence. We describe throwaway inclinations and orientations towards product longevity, the assessment of producers' performance with regards to product longevity, and the perception of lifespan curtailment as deliberate decisions taken by manufacturers. We also verify the acknowledgement of device replacement behavior as non-voluntary, constrained decision, and the perceived consequences of shortened product lifetimes. We mostly use frequency distributions but also compose two additive indexes to provide a basic segmentation analysis. In addition to this, we present results from cross-tabulations and highlight significant differences that will inform whether acceptance or rejection of product obsolescence reflects environmental concerns, perceived sustainable performance by manufacturers, and a particular understanding of product longevity effects and responsibility.

5- Discussion

Brazilians experience with currently owned appliances is relatively fresh and short-lived. On average, mobile devices have been in use for just about 2.6 years, whereas current fridges/freezers stand out with the highest usage seniority, at roughly 6 years. As many as a quarter of PC owners and one in five mobile and washing machine owners have had a functioning problem with their current device (see Fig.1), so technical failure as a proxy for product obsolescence constitutes a tangible reality for a fairly important number of individuals.

³ Devices probed include mobile phone (cellular or smartphone), personal computer, printer, camera, TV, DVD or Blu-Ray, microwave, oven, washing machine, and fridge or freezer.

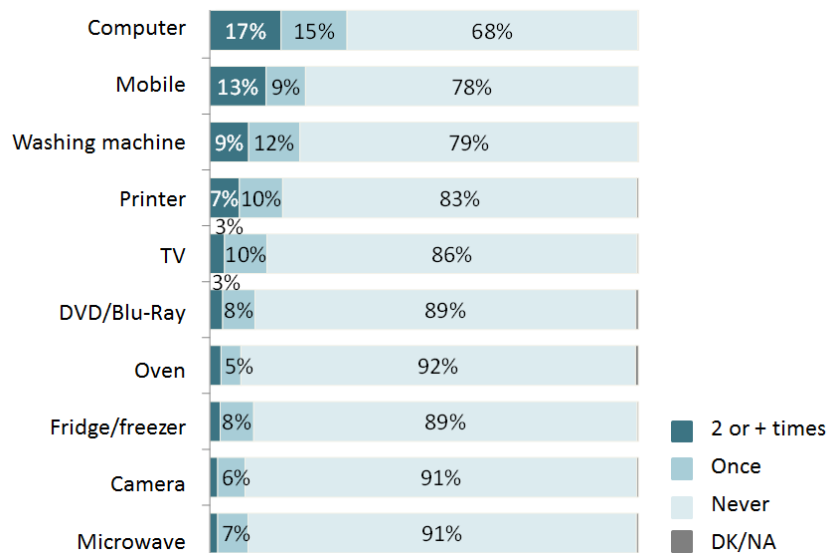


Fig. 1: Experience of technical problems with currently owned device. Samples vary from n=367 to n= 806, depending on device, as ownership of appliances is not universal. Source: Market Analysis, 2013

Predictably performance satisfaction is connected with performance experience (see Fig.2). However, as even though overall levels of contentment remain very high, it is apparent that concerns about product longevity tenuously moderate perceived product usability, which suggests that durability is weakly problematized as an issue. Similar to findings from other studies, product lifetimes remain far from top-of-mind considerations; therefore they have a reduced influence in consumer relationships with brands and future choices (Cooper, 2004; Cox et al., 2013). This suggests that pro-sustainability policy and grassroots action should start by making the issue of product longevity more salient and illustrating its connection with overall performance experience.

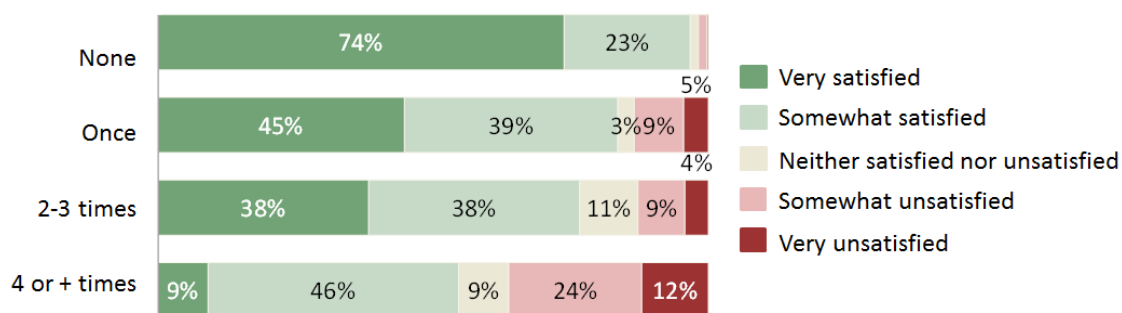


Fig. 2 : Satisfaction with device performance by frequency of functioning problems since owned. Non-numbered brackets count for less than 2% each. ANOVA indicates mean differences are statistically significant at $p < .05$. Source: Market Analysis, 2013

Brazilians acknowledge a gap larger than in other societies when it comes to comparing expected with experienced product lifespan. On average, 66% of Brazilians interpret devices lifespan falling too short from what they think is a reasonable lifetime (see Fig. 3) - a higher percentage of Britons (45%), as informed by Cooper (2004: 429). Similar to the British case, consumers in Brazil hold different longevity expectations across categories. Yet, two patterns stand out: the more portable the electronic device, the lower the

expected ideal lifespan⁴, yet the larger the gap between expectations and experience⁵ - a result which advises that longevity awareness campaigning may be focused on this type of products.

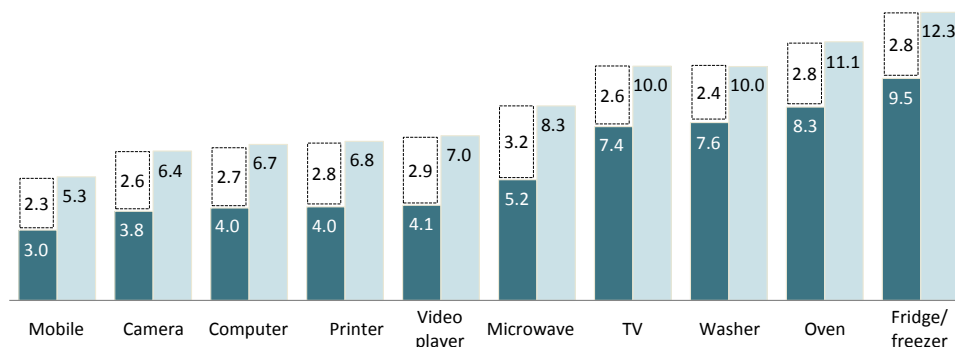


Fig. 3 : Device longevity expectations (reasonable time) and actual experience (usage time before substitution) for currently owned devices (mean of years). Samples vary from n=363 to n= 803, depending on device, as ownership of appliances is not universal. No responses were removed as missing cases. Source: Market Analysis, 2013

Environmental concerns moderately heighten perceptions of faulty product longevity. The perceived gap in product lifespan gets more salient as pessimism grows about the environment, in general ($p < .03$, $\chi^2=17,244$, $df=8$), and the level of pollution, in particular ($p < .01$, $\chi^2=20,064$, $df=8$). This finding stands in contrast with Cooper's (2004: p. 429) who found no effects of environmental views on appliances lifetime.

Survey respondents also provided information about the age of the subset of appliances previously discarded in disrepair, which nearly matched the mean age of all discarded appliances. There were only two exceptions that, tellingly, indicated that in disrepair devices took longer to be disposed⁶. In other words, product flaws in usability do not always explain disposal behavior and the latter becomes a decision taken autonomously from technical failure, a fact that suggests that there is more than functional or performance obsolescence behind consumer disposal and replacement of products.

Compared to Cooper's results for the UK, Brazilians exhibit a reduced reasonable lifespan expectation and a shortened working experience with their electronic devices, especially with regards to portable equipment⁷ - two factors that predict higher e-waste volumes and less sustainable behaviors. Comparing seven electronic

⁴ For example, reasonable lifespan for mobile, computers, camera, and video-players stand at about 5-7 years, whereas for TV, washing machines and fridge/freezers stand between 10-13 years, respectively.

⁵ The gap for mobiles, printers, and DVD/Blu-ray's averages 45% short of what is deemed as reasonable (vs. overall mean difference of 31%, which in categories like ovens get as low as 11%).

⁶ In disrepair washing machines and fridges/freezers were the exceptions, which took about 10% longer to be disposed compared to the average mean of product disposal.

⁷ For example, personal computers and video players in Brazil are expected to work for 5 and 7 years, respectively, vs. 9 and 10 years in the UK. On a similar vein, those devices are disposed after 4 years on average in Brazil, vs. 6 and 7 years, respectively, in the UK.

appliances with available data for both countries shows that in the UK an average of 18.3% adults across these categories expect devices to last at least 15 years, whereas in Brazil only 14.7% of respondents do so⁸. More tellingly, an examination of data beyond mean values reveals that the recorded usage time for already disposed devices exceeds lifespan expectancy for about 1/5 to 1/6 of consumers in the cases of printers and microwaves (16%), mobiles (17%), DVDs and cameras (18%), computers (19%), and about 1/4 of consumers in the case of TVs and ovens (24%), fridges/freezers and washing machines (25%). In other words, for a considerable proportion of individuals their past product lifetime experience with few appliances fails to mold their expectations of future durability, an indirect indication that other considerations influence prospective views about longevity of electronics.

Equally important, another indication of consumer relative detachment from longevity comes from tapping individual expectations to replace devices within the next 12 months. As shown in Fig. 4, inclinations to replace current devices are somewhat or highly likely for 38% in the case of mobiles, 24% in the case of digitals (which include computer, printer and cameras), 19% of household appliances (which include microwave, washer, oven, and fridge/freezer), and 18% in the case of audio-video electronics (which include TV and video-player)⁹.

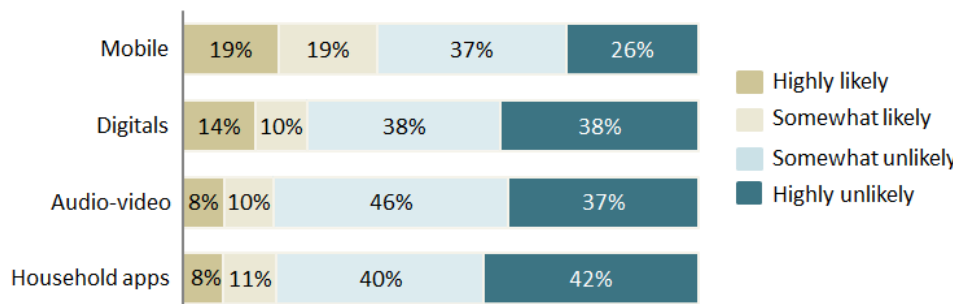


Fig. 4 : Expectations for product replacement (within next 12 months). Samples vary from n=120 to n=321, depending on device, as ownership of appliances is not universal. No responses were removed as missing cases. Source: Market Analysis, 2013

Such propensity for short-term product churn seems to fall in line with suspicions of user experience characterized by decreasing product durability overtime –also noticed in other societies (Cooper, 2004; Cox et al., 2013). Consumer wish of product renewal in the near future is suggestive of individuals’ susceptibility to challenge their own interpretations of adequate life for devices, evidencing the role of subjective factors in moderating the relationship between experience and expectations. However, a suitable test for these hypotheses requires considering the current useful lifetime of devices weighted by the propensity to condition this usage to a short or long-term lifespan as captured by willingness to replace them over the next

⁸ The categories include mobile, computers, video players, microwave, TV, washing machine, and fridge/freezers. Whereas Britons and Brazilians expected in a similar proportion (4% and 33%) that mobiles and fridges/freezers should last 15 years, in other segments like TV, computer or video players the difference in percentage of consumers with that expectation was nearly twice as high among Britons.

⁹ Given limited questionnaire space, respondents were requested to choose a primary reference electronics device to answer the question about likelihood of short-term replacement. Accordingly these propensities for appliances are based on different sub-sample sizes.

months. Fig. 5 synthesizes this information by providing estimates of prior device useful time, current device projected lifetime (usage time of currently owned appliance, weighted by propensity for short-term replacement)¹⁰, useful lifetime evolution (e.g., the difference between prior and projected lifetimes), reasonable lifespan expected, and the precocity rate (e.g., net difference between projected product longevity and desirable durability).

Findings indicate that once propensity to change is factored in, the projected lifetime for currently owned devices is consistently smaller than past useful lifespan experiences enjoyed by consumers - the only exception being mobiles where durability improvement is negligible. For about half of the probed devices (household and audio-video appliances) we estimate major deteriorations in projected longevity. Consumer projected lifetime for currently used items falls short from past experience. In other words, product obsolescence in the form of decreasing product dependability overtime becomes a substantially tangible feature of Brazilian consumer reality. It remains to be seen whether that is perceived as a problem and whether they reason this outcome as fully independent, or not, of their own expectations and actions.

Table 1: Mean estimates of projected lifetime, lifetime evolution and precocity rate (in years)

Electronic device	Prior lifetime	Projected current lifetime	Lifetime evolution	Reasonable lifetime	Precocity rate
Mobile	3	3.1	0.1	5.3	-2.2
Computer	4	3.3	-0.7	6.7	-3.4
DVD/Blu-ray	4.1	4.0	-0.1	7.0	-3.0
Camera	3.8	3.2	-0.6	6.4	-3.2
TV	7.4	4.2	-3.2	10.0	-5.8
Printer	4	3.7	-0.3	6.8	-3.1
Microwave	5.2	3.8	-1.4	8.3	-4.5
Fridge/freezer	9.5	6.2	-3.3	12.3	-6.2
Washer	7.6	3.7	-3.9	10.0	-6.3

¹⁰ Sum of current lifetime of products owned plus added lifetime (based on stated propensity to replace device within the next 12 months), transformed in years unit. Since propensity is captured following an ordinal scale (in degrees of likelihood), we considered that a "highly likely" response implied a de facto replacement situation adding less than a year of useful life to current device. Accordingly those responses took a value of 0.5 (in other words, reference devices were thought as being replaced within half year time from date of survey). The other response options took higher values as they symbolized responses that added more lifetime to currently owned devices (e.g., a "somewhat likely" response = 1, that is, device to be changed effective in one year; a "somewhat unlikely" response = 1.5; and "highly unlikely" = 2, that is, device to be change effective in no less than two years).

Oven	8.3	4.3	-4.0	11.1	-6.8
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Samples vary from n=27 to n=308, depending on device chosen as reference device (as ownership of appliances is not universal). No responses were removed as missing cases.

Source: Market Analysis, 2013

Rather curiously, projected lifetime for current devices lags behind conceptions of adequate life. This gap reveals the precocity rate in discarding devices by consumers, which affects all appliances as indicated by the negative signs in the last column of Fig.5. These findings suggest that consumer decision-making about proper timing for product disposal remains fairly independent of assumptions about adequate lifetime, which leaves room to consider subjective reasons related to psychological obsolescence as drivers of disposal behavior.

A shortened user experience leads to fewer opportunities to try product repair and maintenance, given that device substitution is often anticipated before technical failure. In turn, rapid product churn creates disincentives for the development of a technical assistance market, which is further disheartened by manufacturers' higher returns in promoting new sales rather than in repairing old devices (Thierry et al., 1995). Only 24% of Brazilians looked for technical assistance in the event of product failure - a figure that more than doubles in the UK¹¹. Searching for technical assistance for mobile handsets is less than half that of audio-video electronics (19% vs. 44%), and significantly trails the experience with digitals and household appliances (27% and 23% incidence of searching for repair work, respectively)¹². Alike Britons, the main reason for avoiding repair work has been cost (about 2/3 of respondents in both countries).

The chosen mode for device disposal depends on type of electronics. Whereas the most frequent situation with older mobiles is to keep them at home (44%), audio-video and digitals are largely sold or passed along among relatives, friends or charity groups (74% and 63%, respectively). Fig. 6 summarizes occurrences by class of electronics.

¹¹ Cooper (2004: 437) reports 26% and 38% of respondents who usually and sometimes had their appliances repaired, respectively. We used a yes/no response set pre-screening for those who have had performance issues with their currently owned devices.

¹² Younger cohorts and consumers from the more affluent South East region markets hold the statistically significantly lowest rate of technical assistance search when facing device operational problems.

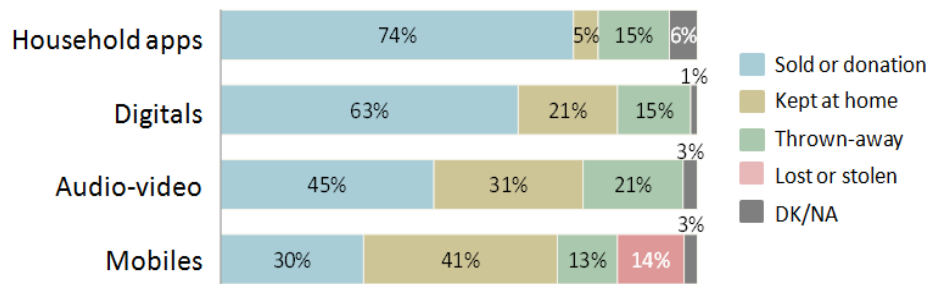


Fig.5: Disposal mode for replaced (older) products. Samples vary from n=67 to n=214, depending on device chosen as reference device (as ownership of appliances is not universal). Source: Market Analysis, 2013

Data suggest a major opportunity for supporting and enabling means to consolidate reuse habits, in the first place, and, alternatively, a second-hand market - once a substantial portion of electronics remain in circulation among other users¹³. Similar results were found in the UK (Brook Lyndhurst, 2011). Also, findings indicate a latent market for technical assistance once keeping replaced devices at home is a fairly ingrained practice among Brazilians - a habit that might also potentially feed a second-hand market. Sustaining the needed infrastructure to maximize advantages provided by both routines will critically hold back increasing levels of e-waste that have characterized Brazilian society over the past decade.

Cross-country comparison with how individuals from other societies, like the UK, react to product longevity reveal some peculiarities of Brazilians, which may well apply to other countries undergoing similar processes of social inclusion through consumerism and the emergence of a consumption-thirsty new middle class. Data indicate that Brazilians expected device lifespan looms large with regards to actual usage time (and exceeds the gap recorded in the UK, in relative terms), whereas their actual usage experience is smaller than among Britons. In theory, these two elements should fuel dissatisfaction, yet at least nine out of ten Brazilians are somewhat or totally happy with their devices durability.

The gap in longevity is effectively acknowledged but wishes on longer lasting products does not become an issue of dissatisfaction with devices. Instead, Brazilians use another mechanism for balancing dissonance by self-adjusting usage habits for a shorter experience. In other words, local consumers use their appliances for less time not just than other mass consumer societies do but even for less time that what these are expected to last. Accordingly, the latent expectation for extended longevity does not necessarily entail a claim against obsolescence nor it reflects a vindicated practice of longer usage. To some extent, such expectation proves itself materially inconsequential; rather, it lays claim to a psychological benefit or guarantee that is hardly acted upon although helps to convey a sense of consumer control upon the useful life to be attributed to the product. Consumers are left in control of the moment and occasion to dispose their products, rather than the conditions for how long they may depend on them, as if those were interchangeable features with equivalent weigh and implications.

¹³ Free giving among acquaintances has been the prevailing option over sales and charity donations, in over 3/4 of cases.

6- Acknowledging product obsolescence

Product replacement resulting from technical failure is acknowledged only occasionally in both countries. Relative obsolescence and symbolic obsolescence seem at play. The later in particular takes up a far bigger magnitude in Brazil than in the UK. Figure 7 compares this information even if not based on perfectly analogous measures¹⁴.

Table 2: Background for replaced devices

	UK	Brazil	Digitals	Audio-video	Mobiles	Household appliances
Beyond repair	46%	30%	25%	33%	33%	28%
In need of repair	21%	23%	22%	15%	21%	30%
Still functioning	33%	47%	53%	52%	46%	42%
Total	100%	100%	100%	100%	100%	100%

Source: Market Analysis, 2013

In nearly half of the occurrences of discarded products, it was not the inability to keep using the devices that shape consumers behaviors but rather a perception of individual inability to feel comfortable and communicate to oneself and others what electronic goods were meant to say. Consumer product churn reflected the inability of devices to uphold the social meaning and identity quality expected from them, leading to their assessment as outmoded and less functional or versatile expression instruments. Compared to the UK, Brazilians seem nearly one and half time more inclined to abide by psychological obsolescence when it comes to electronic devices. These influences get particularly strong in the digitals and audio-video segments.

The weight of psychological obsolescence does not mean that product durability is irrelevant, that consumers live easily with it, or that manufacturers are exonerated of any responsibility. An examination of attitudes that put into context consumers disposal behavior reveal a general picture of disorientation and anxiety - an ambience where policy and grassroots movements have a clear role to play.

Two thirds (66.7%) of Brazilians acknowledge they feel pushed to substitute devices¹⁵, regardless if basing product replacement decisions upon psychological obsolescence or technical failure. In fact, those harboring feelings of discomfort with regards to product substitution are evenly split in terms of their motivations for

¹⁴ In Brazil the question probed for the reasons for substitution of older device offering three response options: the older was no longer working (beyond repair), the older was still working but with problems (in need of repair), or because the new one was more up-to-date, modern, with more features (still functioning). We understand this wording captures more validly the sense of psychological or symbolic obsolescence.

¹⁵ Question-wording: "I feel I end up substituting electronic devices more frequently that I would like to". Total agree percentage.

replacing devices (namely, 33.8% await to replace products only when they are beyond repair or in need of repair, whereas another 31.6% anticipate product switch on grounds of modernity and higher social value).

The fact that about 1/3 of the public explains their product churn behavior upon a rationale of diminishing subjective returns of appliances previously owned and, at the same time, feel uneasy when doing so may suggest that there is a plurality of consumers who apparently find themselves locked in into situations that fed psychological obsolescence beyond their control. This assertion requires a cautionary note, however, as a substantive number of these consumers fail to criticize industry performance on lifespan issues and accepts that consumer anxiety (rather than corporate strategy of product-makers) propels rapid product churn. Only about one in seven individuals (15.4%) willingly admit symbolic obsolescence motivations without feeling as being pushed to choose that option.

In a like manner, people is capable of reflecting upon some of the implications of shorter lifespan provided that the issue acquires visibility and gets explicitly connected to the personal repercussions. Evidence in support of those assertions was collected by asking separate subsamples (with matching demographics) the same question: “Thinking about the launch of new models of electronic appliances every year...would you say that you personally feel more benefited than harmed, more harmed than benefited, or it makes no difference?”, except that for one of the subsamples one specific consequence was made explicit after the opening statement and before stating the response options, using the wording: “...which means that current models get outdated and induce people to discard them.” Results are reported in Fig. 8.

Table 3: Perceived effects of planned obsolescence

	More benefited	More harmed	No difference/DKNA
No mention of personal effect	17.1%	48.0%	34.9%
Mention of personal effect	16.3%	53.3%	30.5%

Source: Market Analysis, 2013

Making consequences explicit stimulates consumers with neutral orientations towards planned obsolescence to connect this issue into a personal agenda of interests; as a result, negative assessments increase in a similar proportion that indifference decreases. It is not a major effect but it clearly suggests that if policy and grassroots mobilization are able to depict the waning product longevity issue into the larger context, including its personal consequences, the balance of mixed feelings and somewhat shallow reactions to this matter may possibly change.

Product durability is praised rather than perceived as a hindrance to a prospective satisfactory user experience. However, concurrently, numerous consumers tend to perceive durability as a superfluous value

if defended on abstract terms. The value of product durability requires to take into account a context in which devices are acquired and used, and to bear in mind their instrumental role to individual's position in society. So, when Brazilians are asked about their orientations towards attaining longer-lasting devices for themselves, 98.3% agree they would do whatever they could to extend their appliances lifetime. Similarly, 85.9% express willingness to fix technical failures in devices to last longer. Yet, a far smaller share of 60.5% voices a preference for reusable, non-disposable devices (rather than disposable ones). And merely 41.9% disagrees with the idea that it is of personal importance to update the version of devices used each year¹⁶.

The net reduction from aspiring to longer-lasting appliances to accepting its frequent substitution for an updated version reflects the effective destabilization of subjective value allocated to currently owned equipment. Noticeably, Brazilians do not attempt at reconciling these views. Factor-analyzing these attitudes yield a two distinctive set of orientations -one for the first two questions on value of durability, the other one for the last two questions about devices as social currency and instruments for self-identity¹⁷- which illustrate the independency of intentions and the difficulties of making of longevity a factor of personal and social value.

7- Assessing producers' responsibility

Mixed reactions to product obsolescence, including its denial as a problem, may also be reflecting consumer self-responsibilization for rapid product substitution cycle. The presumption of autonomy in decision-making has its counterpart in blame-taking. A trade-off assessment of forces propelling obsolescence which considers people consumerism as an alternative driver to producer-led strategy indicates some sense of blame-taking in society. Respondents were asked the following question: "Some people think consumers' anxiety for new things motivates manufacturers of electronic devices to withdraw from product line models that were launched not too long ago. Other people think that manufacturers of electronic devices, by launching new models too soon, force people to dispose models launched not too long ago. Which opinion comes closer to yours?" Over a third of Brazilians (35.2%) consented with the former interpretation of consumers' socio-emotional states as driver of fast-paced product mortality. Even if the majority blamed companies' strategy (58.7%), a sizable number of individuals still consider consumers as accessory partners to the outcome of product obsolescence.

The acceptance of ambiguous standings in relation to the objective and subjective performance of products, and the partial acknowledgment of consumers influence in the production process that shortens product lifespan, does not prevent individuals from developing a critical view of producers' responsibility in molding the context of appliances obsolescence. If, on the one hand, about 2/3 of Brazilians judge on a

¹⁶ All questions measured using a 5 point Likert scale.

¹⁷ An oblimin principal component analysis yielded a structure matrix with two components (eigenvalues of 1,247 and 1,121 accounting for 31.18% and 28.03% of variance, respectively).

favorable light producers' performance in increasing product useful life and informing the public about it; on the other hand, nearly everybody voices an awareness of reduced product lifespan and blame producers' strategy for that outcome. Sympathetic views about product-makers efforts in relation to durability features of devices coexist with discernments that manufacturers had embedded obsolescence in product design.

Consumers interpret that product-makers operate a business approach that seeks to lay the ground for future sales through piecemeal delivery of innovations and deliberate curtailment of product lifespan, externalizing costs to consumers and society. As a result, an intentional stimulation of product substitution is accredited to manufacturers (see Fig.9). These findings echo the way consumers elsewhere perceive industry product optimization processes (Cox et al., 2013).

Table 4: Perceptions of producer-driven product obsolescence (in %)¹⁸

	Agree	Disagree	Neither
Nowadays, electronic devices last far less than in the past.			
Some companies in the electronics industry refrain from offering all technical innovations in their products foreseeing future product launches.	92.9	5.1	1.9
Some electronic appliances are designed to last shorter to induce the purchase of new products sooner.	89.6	8.0	2.3
Manufacturers of electronic products are doing a good job at informing the public about product lifetime and durability.	84.1	14.0	1.9
Manufacturers of electronic products are doing a good job at increasing product lifetime and durability	76.6	20.4	3.0
	74.3	22.7	3.1

Source: Market Analysis, 2013

However, such recognition neither translate into a veto of product-makers nor does it carry a consistently adversarial standing against business practice of embedding functional and symbolic obsolescence in their product offer. The apparent contradiction between overall positive assessment of performance in terms of durability and the public ability to identify product destabilization behaviors by manufacturers lends itself well to one auxiliary interpretation. It suggests that the public disconnects product substitution from product obsolescence or longevity; in other words, the effects of psychological and functional obsolescence run in parallel and are attributed to somewhat different dynamics. Their implicit understanding of obsolescence is

¹⁸ All questions measured using a 5 point Likert scale.

one of severe technical failure, that is, functional obsolescence, which evidence shows it affects a minority of product replacement occurrences.

Companies may be perceived as inducing fast-paced product replacement as part of their business strategy but this remains largely unrelated to a situation of products becoming purposely useless or in disrepair. By the same token, awareness of anticipated product churn stirred by manufacturers is construed as the background where individuals build their seemingly self-oriented judgments about device replacement. Criticism of business approach is, therefore, quite relative as consumers show some acquiescence to industry's rationale about the benefits of the innovation and modernization that inspires creative destruction processes through shorter products lifetimes. Research has sustained that planned obsolescence takes place in a producer-led communication context of destabilization of products qualities and valuation of both fast-changing technological innovation and improved cost-benefit proposition of newer versions (Spinney et al., 2012). Through marketing and advertising, the industry seeks to mobilize consumers to assimilate these propositions, which ultimately instill throwaway responses with rationality and legitimacy (Cooper, 2005; Schor, 2010).

Given the role of electronic appliances as social goods with symbolic meaning and that individuals' appropriation of functional and psychological benefits of devices requires a minimal competence to master product technological and identity features (Warde, 2005), consumers are as likely to condemn obsolescence as they are to condone it, provided it fulfills the associated promise of personal and social modernization. Consumers thus strive for an uneasy balance between fulfilling self-actualization needs through better technology and fashionable design adoption, on the one hand, and attending self-preservation considerations through environmental and economic conservative decisions that will ultimately prevent rapid product churn, on the other hand. These trade-offs should not be overlooked to ascertain realistically how consumers position themselves before product longevity issues and the underlying dynamics behind their opinions.

Further evidence in support of these assertions was collected by asking separate subsamples (with matching demographics) to side with a response option within a specific trade-off formulation (options were randomly rotated in order for each respondent). One half were probed the following question: "Some people think it is good that electronic devices do not last too long because it enables to incorporate new technologies and features that keeps these products up-to-date and keeps the economy moving. Some other people think that short-lived electronic devices is bad because this generates a big amount of waste with negative environmental effects while it also fuels consumerism. Which opinion comes closer to yours?" Nearly seven out of ten Brazilians (69.1%) sided with the first option, agreeing that technological innovation and its macro-economic gains are benefits that overcome the drawbacks of curtailed lifespan. Instead, less than a quarter (23.6%) put a premium on environmental and social habits over product modernization. These findings suggest that planned obsolescence argued in more universalistic terms with regards to its collective consequences tend to resonate favorably in people's minds.

The other subsample answered a differently posed question: “Some people think manufacturers of electronic devices should produce longer-lasting and easy to repair appliances even if these products miss the latest technology or a fashionable design. Some other people think that manufacturers should produce new devices that continuously incorporate the latest technology and more modern designs, even if these products do not last for too long. Which opinion comes closer to yours?” Over eight out of ten Brazilians (81.3%) sided with the first option, indicating a preference for durable devices over fashionable design or technological innovation. Both responses picture apparently irreconcilable preference patterns. However, one can accept that societies with a booming middle class coming out of long-repressed levels of low consumption, like Brazil, may find no contradiction in favoring tangible collective benefits like economic progress over attempts to curtail consumerism (that is, avoid choices that imply a cut in indulgent consumption and economic growth) and still approve a normative call for producers to behave more responsibly with their supply of devices –after all, the cost for acquiring a new device due to obsolescence is bore by the consumer alone.

Public goods like a healthier environment and society may look a distant, less appealing benefit compared to a stronger economy and sustained innovation; on the other hand, the financial implications of relapsed manufacturer behavior forcing product replacement too soon may look very tangible to a majority of individuals still getting used to their newly acquired status of consumers and financially struggling to fulfill the diversity of consumption expectations. In sum, individuals may be looking for the immediate benefits of product modernization while expecting manufacturers to absorb the cost of it, reconciling both outcomes in their product offer.

The balance between autonomously-decided and producers-induced readings of consumers’ management of product obsolescence can better be grasped by examining the interplay of attitudes towards product durability and blame attribution to industry for reduced lifecycles. Two additive indices were produced to that end, enabling the identification of the size and characteristics of segments with antagonizing views about the background of product longevity¹⁹. Each index was dichotomized for the sake of interpretation which yielded four major segments (see Fig.10).

Table 5: Attitudes towards product durability and producer-driven planned obsolescence

Pro-durability

¹⁹ One additive index is composed of the four variables described earlier as surveying opinions about product durability (related to prioritizing practices favourable to longer lifecycles, including repair of technical failures, and preferences for disposable and yearly updated products). After recoding all variables in a consistently interpretable direction we labelled this index “pro-durability”. Respondents with high pro-durability values accounted for nearly 57% of total sample. The second index we labelled “acknowledgement of planned obsolescence” and was composed by the first three items in Fig. 6 that specifically tackles obsolescence. Respondents with high acknowledgement values accounted for 75% of total sample.

		Low	High	Total
Acknowledgement of planned obsolescence	Low	11.3%	13.6%	24.9%
	High	31.8%	43.3%	75.1%
	Total	43.1%	56.9%	100.0%

Source: Market Analysis, 2013

When pro-durability and acknowledgement values are low (slightly over 11% of sample) product disposal is fully internalized and naturalized so there is no attribution of responsibility for device useful lifetime. These consumers behave uncritically as happy discarders of goods. This group hosts the largest proportion of consumers that replaced older devices motivated by psychological obsolescence reasons (62.5%, vs. average of 47%). Predictably, this group holds a conformist view of pollution, waste and environmental degradation. It is also disproportionately younger than any other segment.

However, opinions are not solely based upon environmental indifference or generational factors; this group product experience is one of devices lasting as long as, or even longer than, expected as reasonable (57.1% of such opinions vs. average of 40.6%) and they exhibit the lowest admission of being harmed by producers' precocious launch of new models that turns older ones obsolete (44.7%, vs. average of 53.1%). So their practice experience suggests little reason to identify obsolescence as an issue. Moreover, they tend to agree more strongly than any other segment with giving priority to the economic and technological gains of shorter device lifetime despite environmental and moral effects (75.5% vs. average of 69.1%), conveying a closer value alignment with a materialistic perspective of priorities for society.

At the opposite end, individuals upholding high pro-durability attitudes and exhibiting a heightened blame upon manufacturers for shortened product lifespan account for the largest segment of consumers (43.3%). Their outlook is one of critical consumers, demanding from manufacturers longer-lasting and repairable products (88%, vs. average of 81.4%), resenting more strongly the hindrance of producer-accelerated pace for new model launches (61.7%, vs. average of 53.1%), and somewhat less willing to blame consumers anxiety for obsolescence (31.7%, vs. average of 35.2%). They also exhibit more negative assessments of companies performance for product durability (29.7%, vs. average of 22.7%) and for the quality of public information provided (25.7%, vs. average of 20.4%). They are older and more numerous among women. Their criticism also echoes a stronger concern with environmental issues. Noticeably, their contentious views coexist with feelings of impotence as a sizable number of critical consumers admit being driven by market forces to adopt throwaway practices. Their recognition of being locked in into unwanted situations of technology-driven obsolescence of products makes of them the most receptive audience to policy regulation and grassroots mobilization efforts.

The other two segments are composed by what we called “willing denials” (13.7%) –as they embrace product longevity but overlook producer destabilization of durability, and “comfortable complainers” (31.8%) –as they blame manufacturers for shorter lifespan but neglect value to longevity. Denials and comfortable complainers tend to see producers’ performance on product durability on a more favorable light, with denials being more likely to blame consumers, not firms’ strategy, for product replacement rush.

Denials also champion a reading of psychological obsolescence as an autonomously produced effect, unrelated to companies’ policies, thus nurturing a depoliticized appraisal of product lifecycle. Accordingly, they tend to neglect a feeling of being locked in into situations that force product replacement. Comfortable consumers, instead, nourish a sense of being pushed by market forces to accelerate product turnover unlike any other segment (83.2%, vs average of 66.7%). However, this appraisal is insufficiently strong to spill over as a negative judgment about the industry performance in relation to product lifetime.

8- Conclusions

Acceleration of e-waste growth represents a major challenge for developing societies that also seek to travel the path of sustainable consumption and production. Trapped between consumption thirsty emerging middle classes and increasing environmental problems that sprang from throwaway behaviors, developing societies like Brazil rely on citizen educated choices, companies responsible behavior, and public policy to reconcile the public aspirations for access to, and self-actualization through, material goods with their sustainability targets.

Earlier opinion surveys have ranked Brazilians among the more inclined societies to prefer disposable (rather than reusable) products (Greendex poll, 2012). They also exhibit marginal attention to product durability and the means to maximize product lifespan (Akatu, 2012). Moreover, despite verbal manifestations of high environmental concerns and willingness to embrace greener habits (Greendex poll, 2011), Brazilians hardly connect issues of product durability to other sustainability aspirations (Akatu, 2012). These findings may encourage bypassing consumers and ignoring their views and actions. However, our research suggests the pivotal role of knowing in which way product longevity relates to consumer value.

Our study also uncovers the need to acknowledge consumer agency for making sense of product obsolescence, which is key for successfully advocating extended producer responsibility beyond reversed logistics, in order to include longer-lasting product design, and for successfully reorienting marketing and advertising to present longevity as a product value. Thereby, we agree with Cox et al (2013:27) who argue that “increasing product durability on its own is unlikely to overcome the very significant psychological, emotional and social factors which underpin the rapid churn of products in the modern ‘throwaway society’.”

Product longevity is at the center of the dilemma between fulfilling new middle classes’ aspirations of social inclusion through mass consumption and managing society and the environment sustainably; yet, findings

show this issue remains relatively peripheral to consumers' preoccupations. It is not just a matter of low salience but also of poor connection with the tangible effects of products being replaced before becoming useless. Consumers may recognize that product durability has shrunk, which is a true reflection of their own experience if comparing past lifetime and projected lifespan of devices owned, and may wish it to last longer, but those orientations are far from reflecting their own management of product lifetime. To some extent, consumer-led device obsolescence seems influenced by consumer identity symbiosis with updated products, which nourishes an understanding of product replacement patterns as an ultimate expression of consumer sovereignty. The tendency to expect a lower durability than in developed societies and to replace products earlier as a result not of technical failure but of symbolic priorities illustrates the level of naturalization and internalization of product obsolescence among Brazilians.

Research in the UK has argued that reduced expectations of product functional reliability and durability spring from actual experiences of shortened dependency upon devices (Cox et al., 2013: p. 24). Findings from Brazil echo this reality which reveals a decreasing evolution in product durability. Evidence of consumer concern with being locked-in into premature product substitution and consumer awareness of corporate advantage in stimulating fast-paced substitution processes would suggest that an experience of shortened lifespan products would exonerate the public from any responsibility. However, those realizations are hardly translated into a critical view of business practices from where to infer an opportunity to politicize the issue either through consistent support for regulation, boycott or direct protest.

Product longevity is depoliticized in the sense that it is only obliquely related to manufacturers' initiatives and remains a neutral or problem-free issue, that is, it remains perceived as having no clear-cut consequences for society. Even critical consumers that praise appliances durability and identify producers' responsibility for shortened product lifetimes are susceptible to adopt psychological obsolescence-driven behaviors that lead to precocious replacement of devices and exhibit a candid view of the industry performance with regards to longevity. Such a disconnect seems to ultimately reflect an awareness of questionable corporate practices limited to motivating faster product replacement, a process which is nonetheless perceived as heavily molded by consumers' will. Admittedly, a critical issue of corporate responsibility such as the deliberate design of products and campaigns to kindle product obsolescence and substitution remains ambiguously tackled by consumers. Consumers who are consistently aware of being locked-in into situations beyond their own control remain a minority.

A successful public policy and grassroots mobilization effort away from product obsolescence needs to understand that only a plurality within consumer population is capable of connecting throwaway practices to adverse environmental and social outcomes, and is willing to play an assertive role in influencing manufacturers. Furthermore, those attitudes will not spring from renouncing to value product modernity; rather, they will be propelled through leveraging the value of longer-lasting devices and improving the easiness of repairable, updatable and upgradable products. Concomitantly, we find some potentially

rewarding opportunities for efforts favoring an improved infrastructure for repair and reuse of devices (tackling poor accessibility and cost-benefit imbalances of repair options).

Concomitantly, despite of the perception of technical assistance as highly priced and the discomfort generated by shortened disposal cycles, the success of policy and grassroots mobilization cannot be solely based upon monetary arguments. As research elsewhere has found consumers value purchases made in the short-term more than the savings obtained from delayed buying decisions (Winer, 1997). In other words, psychological obsolescence will be poorly addressed if contested merely on grounds of the financial strain it may provoke –although this argument may resonate more strongly among the emerging middle class aspiring to simultaneously fulfill as many consumption dreams as possible. It is through a reevaluation of longer-lasting durables as appealing signs and scripts for personal identity that action against psychological obsolescence may prove effective. In that sense, better cue-giving for what goods represent and the social function they play, rather than advantageous cost-benefit calculations, may ultimately strike a proper chord among consumers to behave sustainably in their relationships with products.

Finally, research suggests that younger cohorts display shorter lifespan expectations as well as less concerned attitudes in support of product longevity, while they tend to exonerate firms from any responsibility for the ongoing premature replacement dynamics. Even if in the future, as they grow older, income and education may moderate those orientations, we may foresee an intensification of psychological obsolescence. These implications call for a targeted approach in terms of public policy and grassroots mobilization of information about the individual and collective consequences of shortened durables replacement and disposal cycles.

References

- Akatu. **Pesquisa Akatu 2012: Rumo à sociedade do bem-estar**. Akatu. 2012. Disponível em: <http://www.akatu.org.br/pesquisa/2012/PESQUISA AKATU.pdf>.
and Asia Pacific. In: Esomar Latin American Conference, 2010, Cartagena. [s. l. : s. n.], 39 p.
- Associação Brasileira de Desenvolvimento Industrial. **Logística Reversa de Equipamentos Eletroeletrônicos - Análise de Viabilidade Técnica e Econômica**. ABDI. 2013. Disponível em: http://www.abdi.com.br/Estudo/Logistica%20reversa%20de%20residuos_.pdf.
- AUGER, P.; DEVINNEY. T. Do What Consumers Say Matter? The Misalignment of Preferences with Unconstrained Ethical Intentions. **Journal of Business Ethics**, Vancouver, v. 76, n. 4, p. 361-383, 2007.
- Brazilian Electrical and Electronics Industry Association. **Economic Overview and Performance of the Sector 2013**. ABINEE . 2013. Disponível em: <http://www.abinee.org.br/ing/informac/arquivos/pan2013i.pdf>.
- BROOK, L. Public Understanding of Product Lifetimes and Durability. Reuse of Bulky Items. Londres; 2011.
- COOPER, T. Inadequate Life? Evidence of Consumer Attitudes to Product Obsolescence. **Journal of Consumer Policy**. Nova Iorque, v. 27, n. 4, p. 421-449, 2004.
- COOPER, T. Longer Lasting Products: Alternatives to the Throwaway Society. Londres: Gower Publishing, 2010.
- COOPER, T. Slower Consumption Reflections on Product Life Spans and the “Throwaway Society”. **Journal of Industrial Ecology**. Londres, v. 9, n. 2, p. 51–67, 2005.

- COX, J.; GRIFFITH, S.; GIORGI, S.; KING, G. Consumer understanding of product lifetimes. **Resources, Conservation and Recycling**. Philadelphia, v. 79, p. 21-29, 2013.
- DOUGLAS, M.; ISHERWOOD, B. **The World of Goods**. Nova Iorque: Routledge, 1996.
- EVANS, S.; COOPER, T. Consumer influences on product lifespans. **Longer Lasting Products: Alternatives to the Throwaway Society**. Farnham: Gower Publishing, 2010. p. 319-350.
- FERREIRA, F.H.G.. et. al. **Economic Mobility and the Rise of the Latin American Middle Class**. S.l.: World Bank, 2012.
- FISHMAN, A.; GANDAL, N.; SHYM O. Planned obsolescence as an engine of technological progress. **Journal of Industrial Economics**. Malden, v. 41, n. 4, p. 361-370, 1993.
- Globescan and National Geographic. **Greendex 2012: Consumer Choice and the Environment – A Worldwide Tracking Survey**. Canada, 2012. Disponível em: http://images.nationalgeographic.com/wpf/media-content/file/NGS_2012_Final_Global_report_Jul20-cb1343059672.pdf.
- GULTINAN, J. Creative Destruction and Destructive Creations: Environmental Ethics and Planned Obsolescence. **Journal of Business Ethics**, Vancouver, v. 89m n. 1, p 19 – 28, 2009.
- HOLT, D. Constructing Sustainable Consumption From Ethical Values to the Cultural Transformation of Unsustainable Markets. **The ANNALS of the American Academy of Political and Social Science**. Philadelphia, v. 644, n. 1, p. 236-255, 2012.
- JACKSON, T. Motivating sustainable consumption: a review of evidence on consumer behaviour and behavioural change. **Centre for Environmental Strategy**. Guildford, 2005. Disponível em: http://hiveideas.com/attachments/044_motivatingfinal_000.pdf.
- KING, A., et al. Reducing waste: repair, recondition, remanufacture or recycle? **Sustainable Development**. Nova Jersey, v. 14, n. 4, p. 257–267, 2006.
- KOLLMUSS, A., AGYEMAN, J. Mind the Gap: Why do people act environmentally and what are the barriers to pro-environmental behavior? **Environmental Education Research**. Londres, v. 8, n. 3, p. 239-260, 2002.
- MONT, O.; POWER, K. Understanding factors that shape consumption. **ETC/SCP Working Paper No 1/2013**, Copenhagen, n. s., 2009. Disponível em: http://www.scp-knowledge.eu/sites/default/files/knowledge/attachments/wp2013_1.pdf.
- OECD - Organisation for Economic Co-operation and Development. Greening Household Behaviour: The Role of Public Policy. **OECD Studies on Environmental Policy and Household Behaviour**. Paris, OECD Publishing, 2011.
- PEATTIE, K. Rethinking marketing. In: COOPER, T. **Longer Lasting Products: Alternatives to the Throwaway Society**. Farnham, 2010, p.243-274.
- RAJDEEP, G.; MEHTA, R.; KARDES, F. R. The Timing of Repeat Purchases of Consumer Durable Goods: The Role of Functional Bases of Consumer Attitudes. **Journal of Marketing Research**. Chicago, v. 41, n. 1, p.101-115, 2004.
- SANNE, C. Willing consumers—or locked-in? Policies for a sustainable consumption. **Ecological Economics**. Paris, v. 42, n. 1-2, p. 273 – 287, 2002.
- SCHOR, J. **Born to Buy: The Commercialized Child and the New Consumer Culture**. 5 ed, Nova Iorque: Scribner, 2010, 304 p.
- SPINNEY, J., et. al. What I've found is that your related experiences tend to make you dissatisfied: Psychological obsolescence, consumer demand and the dynamics and environmental implications of de-stabilization in the laptop sector. **Journal of Consumer Culture**, Manchester, v. 12, n. 3, p. 347-370, 2012.
- STEELE, M.; LARSON, E. Attention shoppers: Don't look now but you are being tailed. **Smithsonian Magazine**, Washington, v. 23, n. 10, p. 70-79, 1993.
- TABION, M. Emerging market consumers. A comparative study of Latin America and Asia Pacific. **Esomar Latin American Conference**, 2010, Cartagena, [s. l.]: Euromonitor International, 39 p.
- THIERRY, M., et. al. Strategic issues in product recovery management. **California Management Review**. California, v. 37, n. 2, p. 114-135, 1995.
- VISSER, W.; TOLHURST, N. **The World Guide to CSR**. Sheffield: Greenleaf, 2010.
- WARDE, A. Consumption and Theories of Practice. **Journal of Consumer Culture**. Manchester, v. 5, n. 2, p. 131-54, 2005.

WEIZSACKER, V., et al. **Factor Four: Doubling Wealth, Halving Resource Use**. 3 ed. London: Earthscan, 1997, 322 p.

WINER, R. S. Discounting and its Impact on Durables Buying Decisions. **Marketing Letters**. Berkley, v. 8, n. 1, p. 109-118, 1997.

World Bank. **Wasting No Opportunity: The case for managing Brazil's electronic waste**. Washington, 2012, 87 p.