

Understanding Mental Book Value: Exploring Replacement Decisions and Lifetime Expectations

Jelle Thomas Emiel Westervander^(a), Ruth Mugge^(a), Ellis Van den Hende^(a), Marlene Vock^(b)

a) Delft University of Technology, Delft, the Netherlands

b) University of Amsterdam, Amsterdam, the Netherlands,

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Introduction

A substantial number of electric appliances that enter the waste stream are still functional at replacement (Magnier & Mugge, 2022; Woidasky & Cetinkaya, 2021). Although an electric appliance might still be capable of delivering utility, the owner can assess that sufficient value has been delivered (Echegaray, 2016). Coherently, 'it's time for a new product' consistently emerges as one of the primary reasons for a replacement (Magnier & Mugge, 2022). Gaining a deeper understanding of how consumers decide it is time for a new product is essential for encouraging more resource-efficient and environmentally sustainable choices.

Replacement decisions involve two interrelated processes: acquiring a new appliance and retiring the old one (Roster & Richins, 2009). According to the theory of mental book value, retiring an appliance requires consumers to assess its remaining value (Guiltinan, 2010; Okada, 2001). This theory describes how consumers assign the purchase price of an appliance to its own mental account (Prelec & Loewenstein, 1998). Over time and use, the value in this mental account depreciates until it has been fully written off, a point known as the mental breakeven point (Okada, 2001, 2006). The more frequent and positive user experiences are, the greater the value that is obtained and the quicker an appliance reaches its mental breakeven point (Okada, 2001). Before reaching this point, consumers are typically reluctant to replace appliances, as doing so forces them to write off the remaining value, recognise unrepaid costs, and incur a perceived loss (Gourville & Soman, 1998; Okada, 2006). Following the same reasoning, it is not 'time for a new product' until consumers

decide that the former's mental book value has been fully written off.

Some appliances typically become eligible for premature replacement sooner than others, as the depreciation of the mental book value varies with how consumers perceive them (Guiltinan, 2010). For instance, smartphones are often replaced to keep up with trends in technology and fashion, reflecting their importance for consumers' self- and social-identity, whereas washing machines are generally retained longer due to their service utility (Cox et al., 2013). Lifetime estimations – the time that consumers expect an appliance to last or expect to use it – have also been speculated to play a role in how they determine when these have reached their mental breakeven point (Haase et al., 2024; Magnier & Mugge, 2022). However, this relationship remains largely unexplored.

Understanding how the mental book value influences replacement decisions and how this may vary across product categories is essential to encouraging longer lifetimes of electric appliances. This study addresses this by exploring how consumers estimate appliance lifetimes and determine when these have reached their mental breakeven point.

Method

In-depth, face-to-face interviews were conducted at participants' homes using a semi-structured format, allowing new topics to emerge (Gioia et al., 2013).

Before the interviews, participants completed a 20-minute sensitizing booklet designed to familiarize themselves with lifetime and replacement concepts, which contained questions regarding a number of appliances. To

ensure diversity across product categories and enable cross-participant comparisons, smartphones, coffee machines, televisions, and vacuum cleaners were preselected, with smartphones being mandatory due to their high market penetration and short replacement cycles (Magnier & Mugge, 2022; Statista, 2024).

Interview questions ranged from concrete lifetime estimations to those challenging these estimations and uncovering underlying considerations. The concept of mental book value was introduced to participants by asking when they perceived the product to have made its 'money's worth'. All materials were pre-tested in pilot sessions.

Participants were recruited via a university-administered consumer panel comprising a wide-variety of consumers. The final sample consisted of 20 participants with a diversity in age (22-75; mean=49) and gender (55% female, 45% male). The interviews averaged 55 minutes and were fully transcribed. Transcriptions were coded inductively using a reflexive approach to thematic analysis (Braun & Clarke, 2019; Byrne, 2022).

Preliminary results & discussion

A collaborative thematic session with three research team members revealed preliminary findings, with final results to be presented at the conference.

In line with previous research, a higher purchase price was related to a higher mental book value (Okada, 2001), and increased engagement in lifetime-prolonging activities, such as maintenance and repair (Ackermann et al., 2021). Time, frequency, and quality of use also emerged as factors contributing to mental book value depreciation (Okada, 2001).

This research expands knowledge on mental book value by providing qualitative insights into the role of lifetime estimations in determining appliances' mental breakeven point (Haase et al., 2024; Magnier & Mugge, 2022). Appliances were considered to reach this point once they met their estimated lifetimes, and consumers preferred extending their use accordingly. Interestingly, these lifetime estimations were not always time-based (i.e., in years); in some cases, they were defined by usage quantity or

specific milestones, such as 'lasting through one's studies'.

Results also revealed that higher purchase prices are commonly associated with greater product quality and longer lifetimes. Furthermore, technological complexity was often linked to shorter estimated lifetimes, particularly regarding smart functionalities and software dependencies. Differences also emerged between product categories; for instance, smartphone lifetimes were more often linked to how long participants anticipated using them, while vacuum cleaner lifetimes were tied to expected functional failure.

Consumers also formed lifetime estimations based on their anticipated frequency and careful use, as well as external reference points such as warranty periods, contract durations, past experiences, and social observations. These estimations were further updated based on sensory perceptions, technological advancements, and evolving personal preferences.

Finally, the findings highlighted how self-concept influences lifetime estimations and replacement behaviours. A strong aversion against discarding still-functional appliances was also observed, with replacement being perceived as more justifiable when the appliance was resold, handed down, or repurposed – practices that are also linked to recovering residual value before closing the mental account (Baucells & Hwang, 2017; Okada, 2001).

Conclusions

This research contributes to addressing the gap in the literature on mental book value depreciation by uncovering factors that influence when consumers decide that an appliance's mental book value has been fully written off. Moreover, it provides insights into proxies that consumers use for appliance lifetimes, such as their price, brand, perceived complexity, and their own anticipated usage behaviour.

By doing so, this research aims to contribute to research on the mental book value and lifetime estimations. Leveraging these insights could help design strategies to raise lifetime estimations and discourage premature replacement, thereby promoting more sustainable consumer practices.

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