

THESIS FOR THE DEGREE OF LICENTIATE OF ENGINEERING

Hidden Treasures:

Why households retain unused products and
opportunities to bring them back into use

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Cover:

Illustration of a storage from one of the studies included in this thesis. It provides an illustrative example of how a storage space can look, cluttered with assorted products but also containing intentionally stored goods that has been neatly packed in boxes, such as the *old kids' clothes* or the box with things for *Christmas* that can be seen in the illustration.

This illustration, and the illustrations in this thesis, are made by Karin Nilsson.

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Abstract

Facilitating reuse of products is a key strategy to extending product lifetimes and reducing environmental impacts from consumption. However, once a product is no longer in use it is often retained in storage indefinitely rather than recirculated, limiting its potential for reuse in another household. This thesis seeks to enhance the understanding of household product retention with the hopes of increasing the recirculation of unused and retained products.

To examine this issue, this thesis adopts two complementary perspectives: person-product relationship and household practices. Drawing on findings from three papers and a synthesis exploring the interrelation of the perspectives, this thesis addresses the research question; Why are unused products retained in households, as opposed to being divested?

The findings reveal barriers to divestment, and more specifically product recirculation. From the perspective of the person-product relationship, three aspects are identified that influence the divestment decisions made about a specific product: perceived product benefits, perception of divestment work, and divestment conscience. From the household practice perspective, certain connections and key elements of practices contribute to the accumulation of unused products in storage, while others prevent products from exiting the storage in a way that brings the product into reuse. Additionally, the combined perspective reveals a negative synergy – households often wish to purge the accumulated mass of products in storage all at once but feel the need to make individual divestment decisions about each product. The tension from this negative synergy prevents products from being brought out of the storage and circulated back into use.

This thesis contributes with insights about what recirculating products entail for households' everyday life. It identifies barriers that prevent unused products from being recirculated and attempts to translate these barriers into design opportunities that facilitate the recirculation of unused products.

Keywords: Product retention, Product divestment, Design for divestment, Recirculation, Reuse, Circular economy, Household practices, Design opportunities.

*“Clutter is the object’s revenge, on
design and on the world.”*

- Steve Baker

Acknowledgements

In the midst of writing this thesis I found myself standing in the middle of the basement storage of my apartment, debating with my fiancé how to best approach our upcoming move. The storage was filled with things that demanded our attention, boxes to go through and the old IKEA furniture that we still had not decided on keeping or passing along. I found myself in tears, overwhelmed by the situation and the feelings it brought out of me. These were things that I loved or at least had appreciated enough to keep at some point, but now they only brought me frustration. This is a struggle that I share, with my fiancé, with the participants of the studies in this thesis, and with many more. If you have lost control of your storage – this thesis is for you.

I would like to start by thanking my supervisors, Oskar Rexfelt and Helena Strömberg, for the support and guidance that you have provided me with, and for believing enough in me to bring me on in your research project. Thank you, Helena, for always being there to answer my questions and challenging me when doing so. Thank you, Oskar, for being able to see and mention the good things, and for always having the right quote at hand – I promise you that I will not aim for the same ambition as the corpses on Mount Everest.

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Appended publications

This thesis is based on the following publications:

PAPER 1

Nilsson, K., Strömberg, H., Rexfelt, O., Ljungberg, E., & Sköld, S. (2023). Nostalgia, gift, or nice to have – an analysis of unused products in Swedish households. *Proceedings of the 5th PLATE Conference, Espoo, Finland*.

Nilsson analysed the data with assistance from Strömberg and Rexfelt. Nilsson wrote the paper together with Strömberg and Rexfelt.

PAPER 2

Nilsson, K., Strömberg, H., & Rexfelt, O. (2024, submitted). Why your storage is always full: Identifying design opportunities to support divestment of households' unused products.

Nilsson planned and conducted the study in collaboration with Strömberg and Rexfelt. Nilsson transcribed the interviews and analysed most of the interviews, with assistance from Strömberg and Rexfelt. Nilsson wrote the paper with continuous support from Strömberg and Rexfelt.

PAPER 3

Nilsson, K., Strömberg, H., & Rexfelt, O. (2025, manuscript) Everything, everywhere, all over my house - Identifying practices that support or prevent recirculation of unused products

Nilsson planned and conducted the study together with Strömberg and Rexfelt and transcribed all interviews. Nilsson analysed the data and wrote the paper together with Strömberg and Rexfelt.

Additional publications

Nilsson, K., Becker Frahm, L., Rexfelt, O., Strömberg, H., & Nhu Laursen, L. (2025, accepted). Turning Trash into Treasure is Hard Work! How the Activities of Consumers and Reuse Enablers Extend Product Lifetimes. *Proceedings of the 6th PLATE Conference, Aalborg, Denmark.*

Nilsson, K., Renström, S., Strömberg, H., & Groth, S. (2022). Making dinner in an uncomfortable future: Comparing provocations as user insight elicitation methods. *Proceedings of the DRS2022 Conference, Bilbao, Spain.*

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1. Introduction

Transitioning from a linear to a circular economy is a key strategy to reduce the climate impacts of the goods that we consume (Akenji et al., 2021; den Hollander et al., 2017; Ellen MacArthur Foundation, n.d.). Circular economy principles aim to prevent products from becoming obsolete and recover the resources at their highest value when that happens (den Hollander et al., 2017; Ellen MacArthur Foundation, n.d.). By extending product lifetimes and recirculating products and materials, the emissions caused by consumption can be significantly reduced (Akenji et al., 2021).

Product lifetime extension through circulating resources can be approached in three ways: by slowing, closing, or narrowing resource loops (Bocken et al., 2016). More concretely, this can be done by designing products with higher durability, either physical or emotional, or enabling, for example, maintenance, reuse, or refurbishment and remanufacturing (den Hollander et al., 2017). Maintenance and reuse of products are considered to be especially effective strategies (Ellen MacArthur Foundation, n.d.), as they extend the product's lifetime with its current or a new owner without the need for additional industrial processes, compared to for example remanufacturing. Recirculating products from one user to another presents benefits in terms of reducing our climate impact, but it also presents several challenges, particularly for the consumer (Hobson et al., 2021). Recirculation typically entails new practices and adjustments to everyday life that may be perceived as inconvenient, time-consuming or undesirable (Selvefors et al., 2019a). While these practices are essential for reducing the climate impact of consumption, their adoption depends on consumers' willingness and effort (Hobson et al., 2021).

This thesis delves into the retention of products that have become unused. These unused and retained products have the potential to become a resource in the circular economy, as they could be used again by their current or a new owner. However, products that become unused in the household are often moved into storage and retained rather than being recirculated and reused by a new owner (Dommer & Winterich, 2021; Gregson et al., 2007b). The issue of unused products being retained in storage is widely spread. A Swedish study found that 83% of households keep unused items in storage, and in 70% of households' only half or fewer of their stored items are used

(Myrorna, 2018). Retention of products is found to be a default option for many consumers, as millions of unused products are found to be retained in consumers' homes (Ongondo & Williams, 2011).

While the topic of retention and divestment of products has received more attention in recent years, it remains significantly less studied compared to the acquisition and use of products (Haws & Reczek, 2022). Divestment is defined as the final phase of the consumption cycle, as it follows purchasing and use, and consists of both the physical and emotional separation from a product (Poppelaars et al., 2020). Previous research has focused mainly on prolonging product lifetimes and keeping products in use. Therefore, divestment of products has generally been framed as something to avoid, as consumer divestment of products is considered to have negative impacts on sustainability and is closely connected with purchases of new products (Cherrier & Türe, 2020; Cruz-Cárdenas & Arévalo-Chávez, 2018; Sarigöllü et al., 2021). However, seeing that increasing amounts of unused products are retained in households' storages, a shift of perspective is needed to focus also on how to encourage divestment and recirculation of the products that become unused and retained.

Thus, this thesis aims to contribute knowledge on household product retention in the hopes of increasing the recirculation of unused and retained products. This will be done by answering the main research question:

RQ1 - Why are unused products retained in households, as opposed to being divested?

One way of understanding the retention of unused products is by looking into the relationship between a person and a product. This aligns with the perspective that previous research on divestment has taken, which has mainly focused on products that are meaningful or significant to their owner, such as sentimental objects or gifts (Cruz-Cárdenas & Arévalo-Chávez, 2018). From this perspective consumer characteristics (Cruz-Cárdenas & Arévalo-Chávez, 2018), product-related factors and a product's perceived value (Haws & Reczek, 2022; Jacoby et al., 1977; Sarigöllü et al., 2021), as well as situational factors (Jacoby et al., 1977; Türe, 2014) have been found to influence the decision to retain or divest a product.

Design for emotional attachment emerged as a design strategy to counteract the negative effects of divestment, aiming to extend product lifetimes (Mugge et al., 2005; Page, 2014; Schifferstein & Zwartkruis-Pelgrim, 2008;

van den Berge et al., 2021). The approach draws on consumers' emotional attachment to a product, which is recognized to strongly influence the retention of products (Cruz-Cárdenas & Arévalo-Chávez, 2018; Simpson et al., 2019). By enhancing users' emotional bonds to products, designers hope to address premature replacement of products (Page, 2014). While product attachment and retention of products are generally considered to be positive, as they can prolong the lifetime of a product, the strategy comes with unintended consequences. Attachment to products may lead to products moving into passive use or lead to superfluous consumption, as products become used as decorative objects or simply stored away (Kowalski & Yoon, 2022). Thus, attachment can prevent products from being divested and brought back into use (Dommer & Winterich, 2021), limiting product recirculation.

This perspective implies that the decision to retain or divest a product is likely influenced by how a person feels about a specific product, making it a valuable perspective to take when inquiring into why unused products are retained in households. Therefore, I ask this sub-question:

RQ 1.1 - How does the relationship between a person and a product influence product retention?

Another way of understanding why unused products are retained in households is by zooming out to look at the household as a whole. This could be done by shifting from focusing on single product trajectories to looking at divestment and retention as everyday practices (Gregson et al., 2007b). In previous research, looking broadly at consumption as well as in more specific areas such as mobility, energy or nutrition, social practice theory has proven to provide a useful perspective (Gregson, 2023; Kropfeld, 2023; Warde, 2005). This is because social practice theory enables exploration of the complexities of consumption and its connection to domestic and social life (Närvänen et al., 2023).

A transition to sustainable and circular consumption puts considerable demands on consumers (Hobson et al., 2021; Närvänen et al., 2023). This is because it introduces practices that are new to many consumers, such as repairing, reusing, or sharing (Hobson et al., 2021). To enable a shift to circular consumption practices we need to know more about how these practices are performed and also how they fit into the consumers' everyday lives and integrate with other everyday practices (Greene et al., 2024).

Consumption is found to be a practice that is interwoven with other practices in everyday life (J. K. Breadsell et al., 2019; Gregson et al., 2007b). However, little is known about how circular consumption practices emerge and become embedded in everyday life (Greene et al., 2024). Further, knowledge about how the adoption of circular consumption impacts and potentially conflicts with other practices is limited (Hobson et al., 2021). This is especially noteworthy for the practice of divestment, which has received little attention, and only then by looking at the practice in isolation (Gregson et al., 2007b).

Taking a practice perspective to explore households' retention of unused products can shed light on how divestment practices fit into the context of everyday life. Therefore, I aim to inquire into what practices support or prevent the divestment of unused products to inspire possible solutions that can support divestment and recirculation. I do this by asking the following sub-question:

RQ 1.2 - What household practices support or prevent the recirculation of unused products?

The underlying purpose of this thesis is to support the divestment of unused products, bringing them back into use. Design and designers play an important role in supporting this transition as the design of artefacts, such as products, services or infrastructures, provides conditions for and supports sustainability in everyday life. As previously mentioned, design strategies aimed at extending product lifetimes have predominantly focused on concepts such as design for attachment or design for emotional durability, strategies that aim to keep products in use. However, once a product has entered storage, there is little guidance on how design can support households to move that product into circulation and reuse. The work of Poppelaars et al. (2020) offers a notable exception, providing ten guidelines for designers to support users' divestment of unused mobile phones. However, these guidelines are not broadly applicable across product categories.

Therefore, based on the knowledge about why unused products are retained rather than divested, this thesis will explore and discuss possible design opportunities for solutions that can support the divestment of unused products and bring them back into use.

1.2 Reading instructions

This thesis is written with the following structure. Chapter 2 introduces the two theoretical frameworks that I have applied in this thesis. It presents the way in which each of the frameworks contribute to answering the research questions and supports the aim of understanding why unused products are retained in households.

In Chapter 3 the methodology that I have applied throughout this thesis is presented, starting with an introduction to how the studies, analysis work, and resulting papers presented in this thesis relate to my research questions. Following this I introduce the approach I have taken in my research. Finally, I present an overview of the methods I have applied, divided according to the three papers, as well as the method I applied in the synthesis.

Chapter 4 introduces the findings from the three papers included in this thesis, this chapter is divided into three sections. The first two sections introduce the findings from each of the two perspectives that I have taken in this thesis, corresponding to the two sub-questions. The first section introduces aspects influencing the retention of unused products, based on Papers 1 and 2. The second section introduces household practices that support or prevent the recirculation of unused products, based on Paper 3. This chapter concludes with a synthesis that brings the two perspectives together.

Finally, Chapter 5 starts with a discussion about the contributions made in this thesis, by relating the findings to previous research. This is followed by a discussion about the different design opportunities that emerge from the barriers identified in the findings, as well as a section reflecting on the methodology. Concluding this chapter is a discussion on future research.



2. Theoretical frameworks

This chapter presents the theoretical frameworks that have shaped the studies and analyses presented in this thesis. When approaching the main research question, I come from two different perspectives, as illustrated in Figure 1. One perspective zooms in on the relationship between a person and a product, while the other zooms out to look at the household consisting of several members and products that are part of everyday life. Both perspectives are assumed to be of importance to understand why unused products are retained rather than divested. To do this, I draw on two theoretical frameworks, using the different theories as lenses that enable different ways of analysing and explaining why unused products are retained in households rather than being divested.

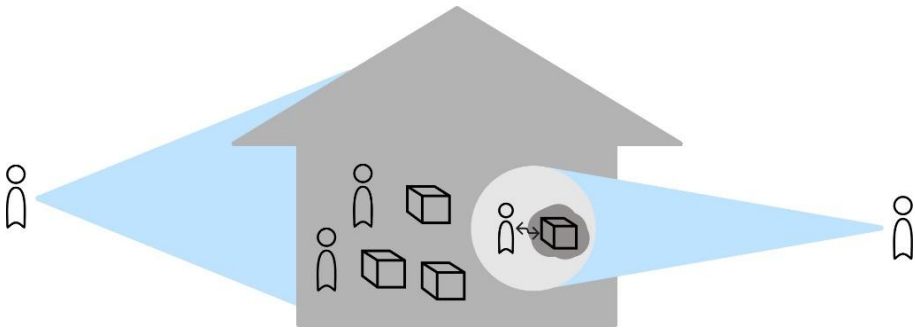


Figure 1. Looking at product divestment in households from two different perspectives

2.1 Framing the person-product relationship

One way of inquiring into why unused products are retained is to look at the relationship between a person and a product and how it impacts the retention of unused products. To answer the first sub-question, how the person-product relationship influences the retention of unused products, I borrow concepts from Hassenzahl's model of user experience. This is a framework that provides tools for capturing a user's subjective experience with a product in varying situations, both their perception of the product as well as emotional responses towards it (Hassenzahl, 2003). The subject of inquiry in this thesis is products that are unused, as opposed to being in use. While the use situation is central to user experience, I argue that these concepts are still

relevant for capturing the way an unused product is experienced by a person, and that this experience can shed light on the product-person relationship.

Hassenzahl's (2003) model of user experience is presented with two perspectives: that of the designer and that of the user. A designer will design a product to have certain features, for

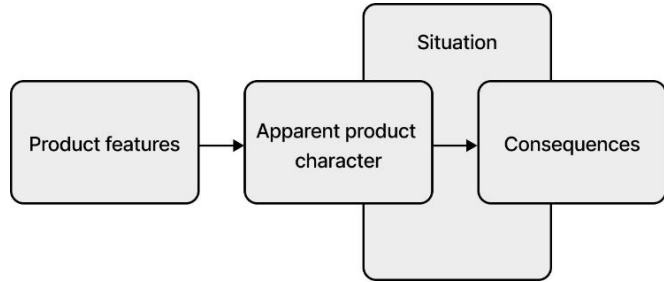


Figure 2. Model of user experience, adapted from Hassenzahl (2003)

example, functionality and presentational style, which are chosen by the designer to achieve an *intended product character*. As a user interacts with the product, they will perceive the specific product features. Based on these features and their own personal standards and expectations, they will construct a personal version of the product character; this is the *apparent product character*. The use of a product with a certain apparent product character will, in turn, lead to judgements about the product's appeal to the person, as well as emotional and behavioural consequences. A person's judgements about a product may vary over time as they are influenced by the specific usage situation and context (Hassenzahl, 2003). This model is illustrated in Figure 2.

Apparent product character can be described as a cognitive structure consisting of groups of *pragmatic* and *hedonic attributes*, (Figure 3). The pragmatic attributes primarily relate to how the product allows for manipulation of the environment and how it enables a user to fulfil their behavioural goals. Thus, pragmatic attributes have to do with the functionality of a product, as well as the accessibility to said functionality. All other product attributes are considered hedonic, being either stimulating by providing new impressions and opportunities, communicating identities, or provoking memories of past events or relationships.

The pragmatic and hedonic attributes are considered independent of one another, and in combination, they summarise the product's character. A user's perception of the hedonic and pragmatic attributes can be either weak or strong, this variation of the two types of attributes results in four combinations, as illustrated in Figure 3. The combination of weak pragmatic and hedonic attributes is considered *undesired*, while strong pragmatic and hedonic attributes are instead considered *desired*.

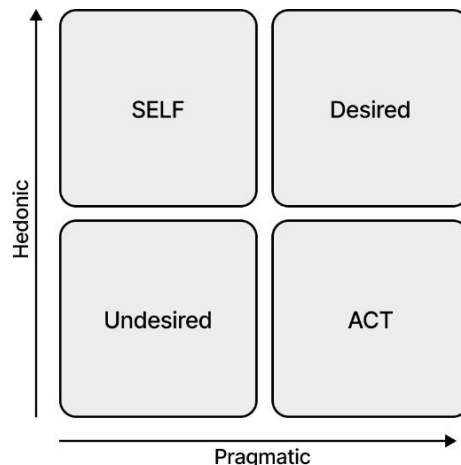


Figure 3. Product character, adapted from Hassenzahl (2003)

Products with primarily pragmatic attributes, *ACT*, link to how the product satisfies its user's behavioural goals. In contrast, a product that is primarily hedonic, *SELF*, links mainly to the users' ideals, memories and relationships. The distinction between different product characters provides a structured way of mapping and understanding how a product is experienced by its user.

2.2 Framing household practices

Another way of approaching the retention of unused products in households is by looking at the household as a whole, often consisting of several household members and containing a multitude of products. This perspective connects to sub-question 1.2, asking what household practices support or prevent the recirculation of unused products. To approach this perspective, I draw upon social practice theory as a theoretical lens. Social practice theory offers a framework for empirical research, a heuristic device of sorts, in the sense that it prompts a certain way of seeing and understanding social phenomena (Reckwitz, 2002). More specifically, it provides a way of understanding society by positioning practices as the central unit of analysis (Kuijer, 2014).

A practice can be understood as a routinized form of behaviour, a way of doing, for example, cooking or working (Reckwitz, 2002). These routinized behaviours are made up of relationships several smaller and interconnected elements. Kuijer (2014) defines the elements that practice consist of as *stuff*, *skills*, and *images* as is illustrated in Figure 4. More specifically, stuff, or materials, refers to the things that are used in the practice (Kuijer, 2014). The things can be of a variety of types, ranging from objects and tools to infrastructures or the body (Shove et al., 2012). The stuff is a vital component for practices, for example a ball and goal are essential to the practice of playing football (Reckwitz, 2002). Skills, or competences, contain both bodily and mental routines, know-how and ways of doing and feeling (Kuijer, 2014). As defined by (Shove et al., 2012), it contains both knowledge in terms of understanding what is an appropriate way to act as well as practical knowledge of how to act that way. Finally, images, or meanings, bring together the following elements: mental activities, emotion and motivational knowledge (Shove et al., 2012). The images represent social and symbolic significance and is what gives meaning to the practice (Shove et al., 2012).

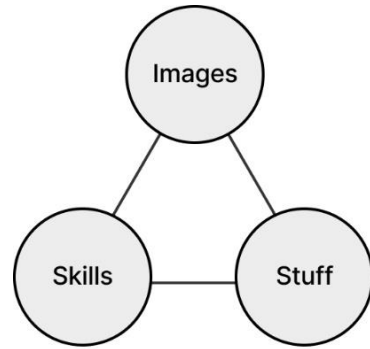


Figure 4. Practice consisting of linked elements, adapted from Kuijer (2014)

Practices emerge, persist, and disappear as links between elements are made and broken (Shove et al., 2012). Practices change over time when performed in new ways, as people adopt other practices, or when practices are connected in new ways (Fraanje & Spaargaren, 2019). Looking at the embeddedness of practices and how the practice relates to other practices is a key factor in studying change (Fraanje & Spaargaren, 2019). Some practices are interconnected in ways that make them co-dependent, as one practice feeds into another or is closely tied together with another, often sharing elements between the different practices (Castelo et al., 2021). For example, the practice of eating is influenced by other food-related practices like shopping and cooking. Practices that are part of such *complexes* of practices need to be understood not only on their own but also by considering the other related practices (Castelo et al., 2021). Practices can also be described as parts of a *bundle* of practices, where the practices are more loosely linked, perhaps

sharing space or time, but not being dependent on one another (Castelo et al., 2021). Eating a snack may take place at the same time as other practices, for example when relaxing in the evening (Castelo et al., 2021). This way of investigating practices brings an additional dimension to understand and describe everyday life, as a multitude of practices are performed within the household as part of everyday life.



3. Methodology

The following chapter presents the overall methodology applied in this thesis. It presents the studies and analysis work performed that led to the three papers included in this thesis as well as a synthesis of the work. It also connects the findings from the papers and the synthesis to the research questions that I ask in this thesis.

The results in this thesis are based on three papers that were produced as part of the research project *Mining Garage Gold*. Each of the papers provides different perspectives on households' product retention and contributes to answering the research questions in the following way. The findings from Paper 1 and Paper 2 provide an answer to research question 1.1, how the person-product relationship influences the retention of unused products. Findings from Paper 3 answers research question 1.2, providing insight into what household practices support or prevent the recirculation of unused products. The answers to the two sub-questions and findings from the interview study are brought together into a synthesis, which provides additional insights to the main research question of why unused products are retained in the household, as opposed to being divested. Figure 5 illustrates how the different studies, analysis work, and papers included in this thesis, as well as the synthesis are connected to one another and relate to the main research question and sub-questions asked in this thesis.

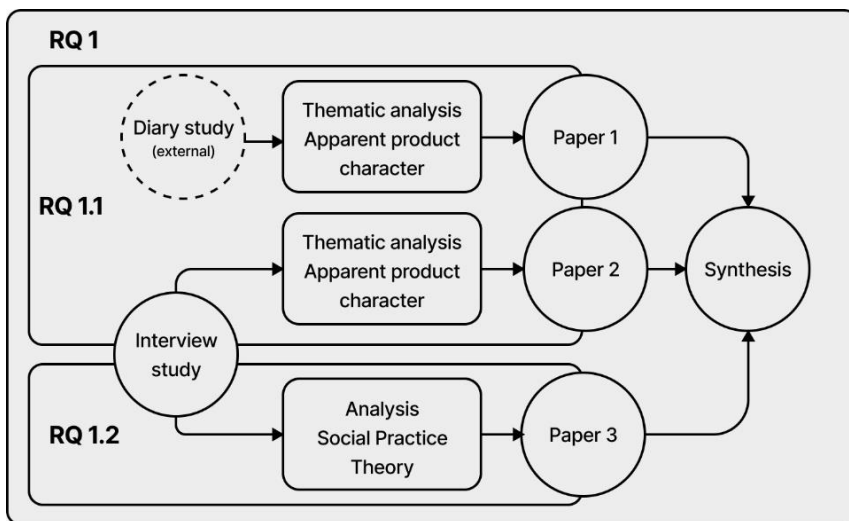


Figure 5. How the studies and papers connect and relate to this thesis research questions

The findings of the three papers, together with the synthesis, highlight a variety of barriers that prevent divestment and recirculation of unused products. These barriers are used as a starting point in the discussion to explore opportunities for design to address these issues and support recirculation practices, thus contributing to the objective of this thesis.

3.1 Everyday life in focus

In this thesis, I approach the research questions with an emphasis on everyday life. Taking everyday life as a focal point in this research is essential, as everyday life is a crucial context for understanding society and the forces that shape it (Lefebvre, 1984). It is central to conceptualising, designing, and enacting sustainable transitions, which is the objective of this work. To achieve this, I have situated much of the research in the real world. Conducting interviews with the households in their own homes ensures that the studies come closer to everyday life to capture the context, which I believe is of great importance for understanding the challenges that households face in divesting products in more circular ways.

3.2 Methods of the papers

The following section will introduce the methods for each of the papers included in this thesis. One of the studies included in this thesis resulted in two of the papers, the data collection of this study is described as part of Paper 2, but also is the base of Paper 3.

3.2.1 Paper 1 – Nostalgia, gift, or nice to have

Paper 1 is based on secondary data from a diary study exploring households' retention and divestment behaviours. The diary study was conducted as part of a master's thesis (Ljungberg & Sköld, 2021). Their study consisted of 45 participants, primarily women aged between 22 and 68, from various regions across Sweden. Over a period of four weeks, their participants completed a diary (see Figure 6) with multiple guiding prompts (Hanington & Martin, 2012), documenting their retention and divestment behaviours, as well as any products that were acquired throughout the study.

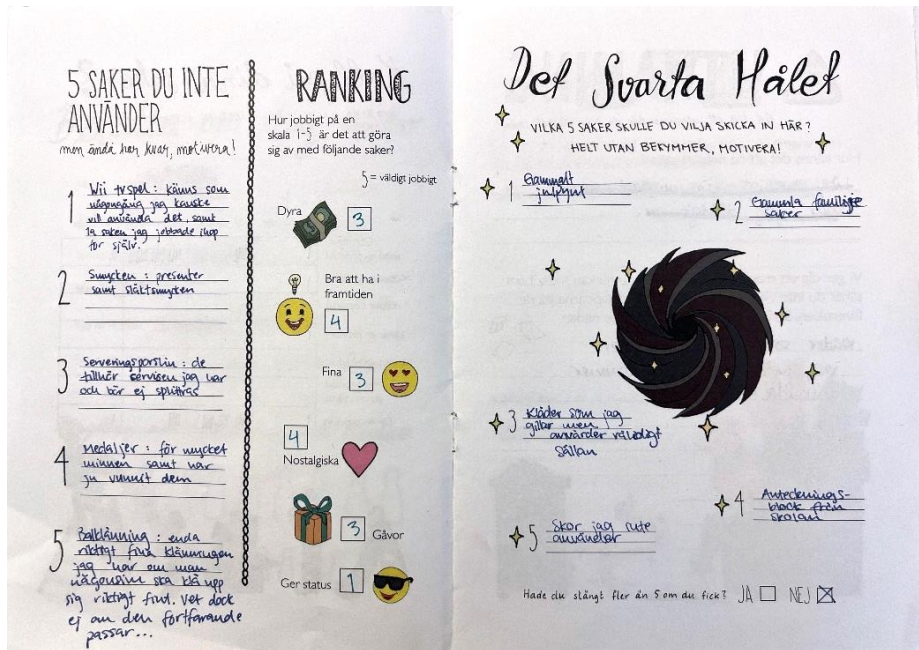


Figure 6. Filled in diary from the study, showing the two prompts

Our analysis focused on the responses to two specific prompts: (1) “Five things you don’t use, but still keep,” which highlighted products that participants kept despite the product being unused, and (2) “The black hole,” where participants identified products they wished could disappear and provided motivations for why they wanted the product to disappear. These motivations revealed barriers to divestment. The responses to the prompts were coded and grouped into themes following a thematic analysis structure (Braun & Clarke, 2006). Hassenzahl’s (2003) concept of *apparent product character* was employed to structure the analysis.

3.2.2 Paper 2 – Why your storage is always full

Paper 2 is based on interview data collected in a household study conducted within the research project *Mining Garage Gold*. The household study aimed to uncover deeper insights on the various types of products retained in households but also to provide an understanding of what role the household and household context play in the retention of unused products.

The household study included 23 participants from 20 households. Participants came from households ranging from single households to households with up to five family members. Their living spaces ranged from smaller, more centrally located apartments with storage in the attic or basement to bigger suburban houses, as well as countryside houses with significant storage capacity. The recruitment of participants was strategic to include a balance of participants in the study that varied in age, type and size of household, as well as housing type and size.

The household study started with a sensitizing activity (cf. Sleeswijk Visser, Stappers, van der Lugt, et al., 2005) before the interview. The goal of the activity was to prompt the participants to reflect on the unused products kept in storage and their storage practices before the interview. Each of the 20 participants was asked to fill in a booklet (see Figure 7), prompting the participants to reflect on their storage spaces and the unused or less frequently used products retained in there. The participants were also provided with tags to attach to products in their storage that they considered to be unused (see Figure 7). This was done to get the participants to engage with and reflect on the products that they kept in one or several of the household's storage spaces. On the tags, the participants were asked to note why the product was retained, how they would feel about divesting it, and to estimate the product's market value. The tags were of four different categories, reflecting the types of unused products found in Paper 1 and the different types of apparent product character: *It means a lot* (1), *It could be useful* (2), *Want to get rid of* (3), *Other* (4).



Figure 7. Filled in booklet and tags from the household study

After the sensitizing activity a household visit took place, beginning with a semi-structured interview capturing responses in the booklet with additional questions from a prepared interview guide focusing on divestment and storage practices in the household. The products that the participants had tagged during the previous sensitising activity were discussed in depth during the interviews, as participants were asked to expand on why the product was retained and their thoughts about the product’s future – in or outside of the household.

For Paper 2 the unused products identified in the study were categorized by product type using the COICOP framework (United Nations, 2018) as well as by apparent product character (Hassenzahl, 2003), which provided a structured overview of the types of products retained and their associated product character. This classification enabled a clearer understanding of the variety of products retained and the underlying reason for its retention.

The interview data were coded and grouped into themes through a thematic analysis (Braun & Clarke, 2006) aimed at identifying patterns behind the retention of unused products within households. The coding process was iterative, with codes being refined progressively as the analysis deepened. Over time, the coding schema was refined and evolved to reflect a more nuanced understanding of the underlying reasons for retention. This approach helped uncover a range of underlying motivations for keeping unused items, each associated with distinct apparent product characters. The

model of apparent product character helped structure the analysis of peoples' experiences with products, as the participant's reasonings around why unused products were retained could be divided into different apparent product characters. The rationales for retaining these products were mapped into one of three categories: *SELF*, *ACT*, or *Unwanted* product character, illustrating the role of product attributes in the decision to retain certain items. From the analysis, a model was developed to capture and explain the concerns participants had in making a divestment decision and how these concerns influenced said decision, often complicating the recirculation of an unused product.

3.2.3 Paper 3 – Everything, everywhere, all over my house

Paper 3 is based on the same interview data from the household study, as presented above. The interview data was analysed, this time using social practice theory as a theoretical lens, looking for key elements that constitute circular and non-circular practices in the households, as well as mapping different practices and how they were connected and intertwined in ways that enabled or prevented the recirculation of unused products. This was done by going through each interview again, mapping how practices and elements of practices caused products to move into and within the household, as well as how it led to products getting stuck in or moving out of the households. These mappings were compared to identify themes of different ways a product moves through the household and storage. The comparison of the practices, connections, and elements from households who engaged with recirculation more frequently with those who were less engaged, highlights connections as well as key elements that both support and prevent households' engagement with product recirculation practices.

3.2.4 Synthesis

In the synthesis, I attempt to bring together the two perspectives that are presented in the three papers –the person-product relationship perspective and the household practices perspective. I did so because I found indications of interrelationships between the perspectives in how the household study participants talked about their challenges with divestment, as they shifted between talking about the specific product to how divestment fit into their everyday. In the synthesis, I asked the questions: do the perspectives connect to one another, and if so, how does it influence the retention of unused products? I attempted to answer these questions by mapping the two perspectives, starting with the practices presented in Paper 3, following the different ways in which products moved into and out of the storage. Following this step, I revisited the interview data from the household study, looking for patterns in which perspectives became prominent over the different practices. The mapping of how the two perspectives connect was done visually and in text. It highlights how households are torn between these two ways sorting through their unused products, which has additional implications for recirculation bringing unused products into reuse.



4. Findings

The following chapter presents the findings from the three papers included in this thesis. First, findings from Papers 1 and 2 will be presented to explain how product retention can be understood by looking at the relationship between a person and a product. These findings correspond to research question 1.1 and provide insight into what makes a person retain certain unused products rather than divest them. Following this, findings from Paper 3 will be presented to provide insight into what household practices support and prevent the recirculation of unused products, corresponding to research question 1.2. Finally, these perspectives will be brought together in the synthesis to provide a holistic understanding of how the two perspectives connect to one another, providing additional insight that answers the main research question, why unused products are retained in households as opposed to being divested and reused.

4.1 Aspects influencing retention of unused products

As a person is sorting out unused products in their storage, they will often contemplate what to do with the product - whether they should retain or divest it. If they decide to divest the product, they will consider how the product should be divested, if the product could be gifted or sold or simply recycled or thrown away. In making the decision, I have identified three main aspects that come into play: the *perceived product benefits*, *divestment conscience*, and *perception of divestment work*. These aspects, presented in Figure 8, emerge in the divestment decision and together they influence divestment of a specific product. The following chapters present each aspect in more detail and elaborate on how these aspects interrelate with one another and influence the divestment decision an individual makes for a specific product.

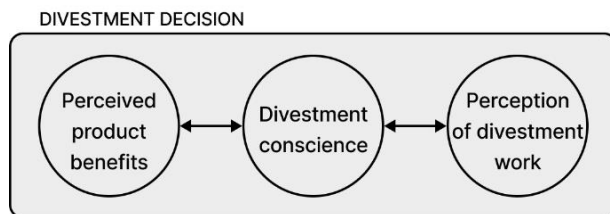


Figure 8. Aspects that influence a divestment decision.

4.1.1 Perceived product benefits

One important aspect that was found to impact the decision about whether to retain or divest an unused product was whether the product would be valuable to its owner in the future. Both studies uncovered a variety of unused products that had been retained because their owner saw a potential benefit in keeping the product. Products retained due to a perceived benefit fell into two main categories: *SELF*, or emotionally significant products, and *ACT*, or potentially useful products. Most of the unused yet retained products presented in Paper 1 fall into either of these categories. Figure 9 presents different sub-categories of retained products from Paper 1, where each category explains the rationale behind why products were retained and how they map on the scales of pragmatic and hedonic. The potential benefit that the owners saw often led the owner to retain the product, keeping it unused in storage, awaiting the moment when it would provide them with value again.



Figure 9. Groups of unused and retained products found in the diary study, mapped by apparent product character

Many unused products were kept for their emotional significance, representing relationships, memories, or aspirations. Even for items with seemingly pragmatic attributes, such as sports equipment or clothing, retention was often driven by emotional attachment to the product. These items symbolized "*When I become who I want to be...*"—aspirational identities, found in Paper 1, linked to a potential future where they might be used again, such as when taking up an old hobby or being able to fit into an old piece of clothing again.

Nostalgia was a prominent driver of product retention found in both studies. Products such as childhood toys or memorabilia were preserved because they held memories of past experiences or significant life events. Participants often found it difficult to discard these items as they embodied personal or family history, making the divestment of these products feel like a loss of the memory it represented as well as the product itself. As was the case in one household where the participant talked about some paintings he had inherited from his grandmother that were currently not used and unlikely to be used in the foreseeable future, saying that divesting them would feel "*like erasing a bit of [my grandmother] and that memory*" (19)¹.

Inherited and gifted products often held sentimental value, representing bonds with family members. Both studies found that attachment of this kind compels owners to retain such items, even though they were unused. Some participants expressed guilt and a feeling that discarding these items would betray the memory of the relationships the product represented. One participant found herself thinking that she would "*let someone else down if [she] didn't keep something or if [she] got rid of some memorabilia*" (3). While participants hoped to pass on their inherited products to the younger generation so that the perceived value and history of the product could be maintained, this was often difficult to do as younger family members often expressed a disinterest in the product. One household encountered this challenge when trying to pass along china, which they had, in turn, inherited. Finding that "*the next generation has enough as it is, which is a shame because then [inherited goods] will be sold at the flea market for only 10 kronor a piece*" (9F). This disinterest compounded the difficulty of letting go, as owners struggled to part with objects symbolizing family history.

¹ This, and subsequent quotes, are numbered according to the list of participating households that can be found in Paper 2.

But unused products could also be retained for their potential usefulness or pragmatic value. Both studies found that many products were retained because of their anticipated future utility, as the owner believed that the product would become useful in the future again. Retaining such products provided the owners with peace of mind, as they knew that if they ever needed the product in the future, they would have it readily at hand. For example, some households kept extra flowerpots, wallpaper, or tiles as resources to meet potential future needs. Retaining potentially useful products also reduced the likelihood that they would later regret having discarded a product that they would need at a later time. As one participant notes, “*that is the hard part, you think that it might come in handy, so I don’t throw it away. And then it comes in handy, and I think that it was good that I didn’t discard it*” (17M). This fear of regretting divestment was repeated throughout most of the interviews in the household study as a reason for retaining unused things.

Items awaiting action, such as tools or supplies, were often retained with specific plans for future use in mind. At the same time, other products were kept in case of more vague or unexpected needs. One participant had retained an old record player for such a purpose, saying, “*In my defence, if I ever want to play one of my old records, I’ll need the player, but in reality, I’m lying to myself*” (9M). While the record player would be useful in this scenario, it was, in fact, unlikely ever to happen. Paper 2 finds that some products were kept purely for their intrinsic utility or high quality, even when their actual future use was unlikely. One such example is one of the three barbecues found in one of the households, while the participant saw no possible use for it, he “*cannot get rid of it, [because] it is an excellent BBQ*” (7).

4.1.2 Perception of divestment work

Both studies found many unused products that are retained in the household even though they were unwanted by the household, as they held neither hedonic nor pragmatic value for their owner. In Paper 1 (see Fig. 9), these are found to be products that the household wanted to get rid of but had not yet divested. Some of the unused products identified in Paper 1 were products that had been replaced or rendered irrelevant for the household, as the product no longer fulfilled a need for their owner, such as the vacuum cleaner that one of the households had replaced and that was “*forgotten and moved into a corner*” (9M) where it had remained. These unwanted yet retained

products highlight another important consideration for the owner: the perceived divestment work.

Divesting products that one no longer wants or needs often requires a significant level of work, although varying for different types of products and between the different divestment paths one can choose. Both studies found that the logistics of divestment was one great barrier, this was especially noticeable for larger products such as furniture. For other products, it was instead the perceived lack of time to carry out the work or that they expected the work of recirculating the product to be too effortful. In many cases, the participants would postpone the work; some would not even reach a decision on if and how to dispose of the now unwanted product. As one participant puts it, *“It would be a relief if someone would come and take these things, then I would give them away for free, to not have to do it myself”* (11), indicating how challenging she finds the divestment work to be. This aligns with findings from Paper 1, where participants reported many products that they would want to disappear in a black hole, wishing that the product would be removed from their storage but without having to do the work themselves. Another participant made a comparison to acquiring a product, saying that *“it is easy to get a new one but to divest one it is... harder”* (20). Paper 2 indicates that it is often participants’ perception of this work, rather than the work itself, that prompts them to retain the product. The perceived work of divesting the product is anticipated to be more effortful and difficult compared to keeping the product in storage, which essentially requires the owner of the product to do very little or nothing at all.

4.1.3 Divestment conscience

Finally, Paper 2 highlights an aspect that was frequently considered when households contemplated if and how to divest an unused product – what is the right thing to do with the product? Among many of the unwanted products in the household it was not the perception of divestment work driving retention, but rather counterintuitively, the households’ wish for the product to come into use again. As presented in Paper 2 many unused products were retained because the owners hesitated to part with them unless specific conditions were met regarding the product’s reuse. Participants would retain these products because they felt a sense of responsibility toward the product, other people, or the environment.

Many participants hesitated to divest items unless they could ensure that the product would be reused because they did not want the product's potential utility or quality to go to waste. The unwanted bookshelves in one of the households were such an example; *"they are not nice in that way but have good quality. So, no one will want them, but throwing them away would feel like a waste"* (7). Even in such cases when the product was unwanted by the household, the thought of having the product recycled or thrown away rather than used by a new owner prompted the participants to keep it. Retaining the product meant that it still had the potential to move into use again, which many of the participants found to be important.

Divesting a product often involved finding a new owner who would appreciate or need the item, often someone who would understand or care for it appropriately. One participant neatly formulated it as *"I'm not so keen on keeping it, but then I need to find the right home for it"* (15F). This search for *the right* recipient not only allowed participants to honour the product's value but also eased the emotional burden of letting go, as they felt the item was *going to a good home*. As was the case with the lace pillow and bobbin found in one household, which the participant believed difficult to sell, noting that *"even if I can't sell it, I want it in the right hands, someone who enjoys lacemaking"* (4). However, how to find a divestment path that would bring the product into reuse with the *right person* was not always clear for the participants, and this was often believed to require significant work. One participant reasoned that while her cake stand would be easy to recirculate, the books in a foreign language or a poorly functioning robot vacuum would put up more of a challenge; *"I'm sure there is someone who would like it, but the question is who is that and how do I reach them?"* (14). As a result, many unwanted items remained in the household due to the owners' divestment conscience because retaining the product in storage kept the possibility alive of doing the right thing with the product, even at the cost of storage space and convenience.

4.1.4 Consequences of different divestment decisions

Perceived product benefit, divestment conscience and divestment work appeared to play an important role in the divestment decisions households made about unused products, varying in influence between products of different character. Questions about the usefulness or meaningfulness of the product now and in the future, what is the right thing to do with the product,

and how much work doing so will require of them seem to influence the decision. Recirculating the product was often the most desired action. However, this was found to be challenging and effortful in terms of the divestment work involved. In contrast, discarding or recycling a product often requires less work (Figure 10).

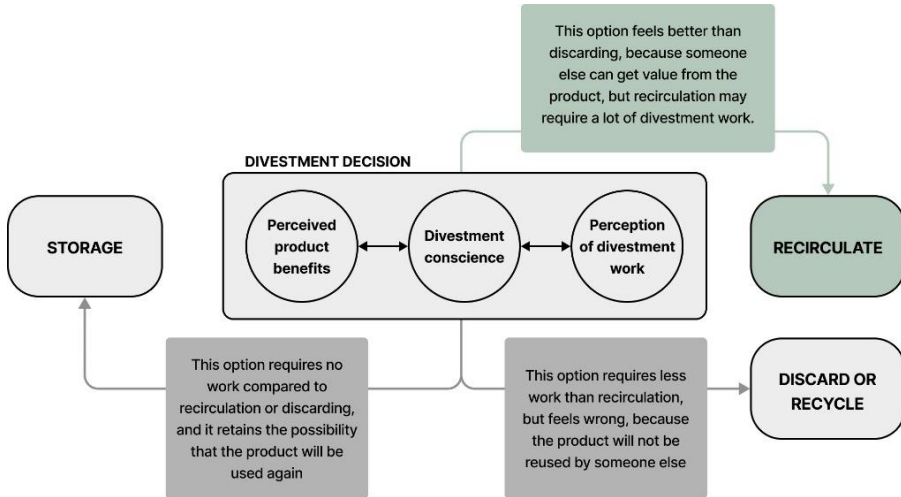


Figure 10. Aspects that influence divestment decisions and how they lead to different divestment paths

Currently, in Sweden, there is much infrastructure in place, such as recycling centres and the waste management system, which lowers the threshold divesting products through these conduits. But while discarding or recycling would bring relief to the participants, as it brings unused products out of the household and creates space in the storage, the households generally felt like the wrong thing to do as it did not bring the product into reuse. While it would not bring as much relief to the participants, the easiest thing to do was often to do nothing at all. By leaving unused products in storage, they delayed making a difficult decision and any divestment work, while the product still retained the potential to become reused again in the future.

4.2 Practices that support and prevent recirculation of unused products

Broadening the perspective and examining households' divestment of unused products from a practice perspective offers additional insights into why unused products are retained in storage² rather than being divested and recirculated. While some traces of practices that support and enable recirculation were found in the household study, most of the identified practices counteract or prevent recirculation of unused products. The following sections will present the practices, as well as the connections between them, to illustrate how they in different ways supported or prevented recirculation of unused products.

4.2.1 Purchasing practices

Products were primarily acquired as a part of purchasing practices to be used as materials in other household practices. While many products were bought with a specific purpose in mind, some households in the study experienced a significant and unplanned inflow of products. For example, some participants found joy in discovering *treasures* at the flea market or making purchases based on the excitement of a bargain without necessarily considering the actual need for these products. One participant compared her flea market browsing with searching for mushrooms, saying “*finding something nice at the flea market is like finding chanterelles*” (11), noting that it was difficult to resist buying such items due to the “*euphoria when you find something nice*”. Many of these products were immediately moved into storage spaces in the households, as they lacked a designated place in the living areas of the household, leading to an accumulation of products in the storage. In one household, one of several storage spaces had been jokingly renamed *the flea market* because that was where thrifted items ended up (Figure 12).

² When writing about storage, I am not only referring to the physical storage spaces for dedicated storage such as the basements or attics that can be found in many houses or apartments today. In the term storage I also include the less dedicated spaces, such as the back of the closet or the junk drawer, where things collect.

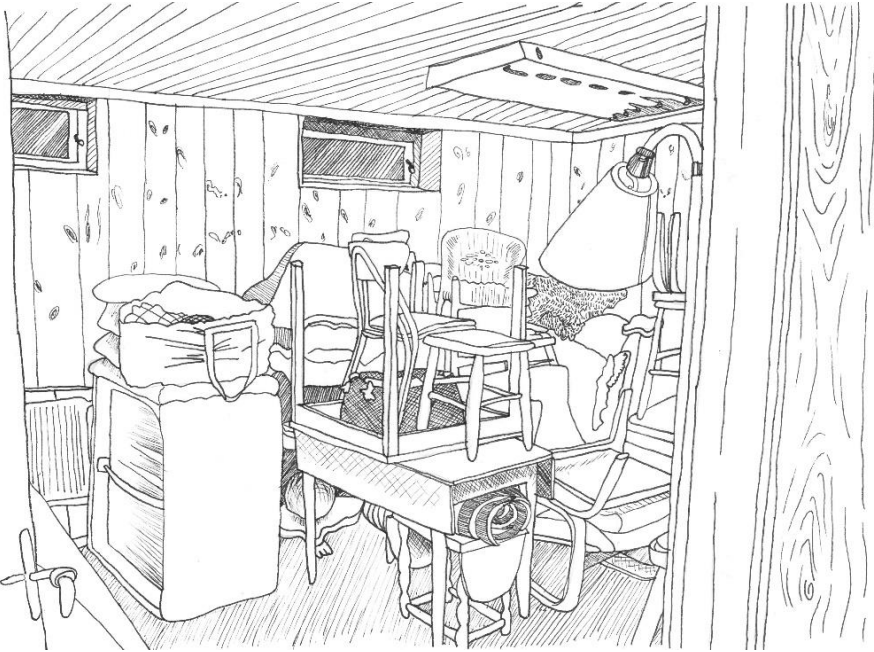


Figure 11. The so-called flea market in household 11

Storage spaces that were full or disorganised also contributed to this inflow of surplus products. Households often purchased duplicates of products they already owned that were forgotten or could not be located when needed. Such as when “*you don’t find the tool so you end up buying a new one, so now I have at least three staplers because I couldn’t find it*” (7) or the Christmas decorations in the attic of another household; “*you forget that it is up there, and then you buy more*” (9M). This pattern of moving products from acquisition into storage binds up resources that could have been used by another household, and it contributes to the growing mass of products kept in storage in the households that further exacerbate the issue.

In contrast, some households appeared to be helped in their quest to divest by establishing a direct link between purchasing practices and sorting practices. One household had realized that “*if we have a large in-flow of stuff, we need to have a large out-flow of stuff from our home, or there won’t be enough room for everything*” (6). As a result, they adopted an ongoing process of sorting things out: “*a continuous effort really, rather than getting rid of everything at once, it’s a process*” (6). Another household echoed this mindset; “*I have the principle that if I buy something, I have to get rid of*

something” (2). Ensuring that products were continuously moved on as new products were acquired helped these households maintain a balanced flow of products.

Some participants even considered how to divest a product at the time of acquisition, allowing them to be prepared to divest the product when they no longer needed it. This was the case with one participant, whose frequently shifting of hobbies required him to purchase new equipment, such as a printer for photography or a 3D printer. Aware of this pattern, he deliberately planned for divestment of the products at the time of acquisition, quickly passing the products on once they were no longer in use. He recognised that *“more technological things are not worth keeping, because they rarely come back into fashion”* (10). He also demonstrated good self-awareness in his decision to divest these products, as he seemed to be confident in his ability to determine whether he would need these products in the future.

4.2.2 Storage practices

A product’s transition from use into storage was often a consequence of other household practices. Products appeared to move into storage through three different pathways, each with implications for the divestment of the product. As previously discussed, some products moved directly into storage, while the other two transitions will be presented below.

One pathway into storage was intentional and deliberated, where households purposefully stored certain items, such as the storage of childhood memorabilia in nostalgia boxes or old photographs that one intends to keep. The intentional storage practices mainly involved unused products that the owner was somewhat certain that they wanted to retain. However, intentional storage also included products the owner felt conflicted about divesting, as they had not yet decided on whether to divest the product.

The intentional movement into storage often led to products being placed in storage boxes grouped with items of a similar category. The image of maintaining orderly storage was strong among the interviewed households, motivating the household’s attempts at organizing their stored belongings in this way. In some cases, storing products in categorised boxes could help the households with recirculating products, such as with children’s clothes: *“they grow a lot, so we have boxes with future clothes that were gifted to us, grouped by size”* (19). However, organized storage practices were often found to complicate the divestment and recirculation of unused products.

Products stored neatly in their designated places gradually blended into the background. One participant noted that although she frequently accessed her storage, she no longer saw the items placed there and that she had “*become blind to the things in my storage*” (11). Another household described how unused products had become indistinguishable from the mass of unused products in storage, stating that they had become “*part of the interior*” (19). These stored-away products often remained unnoticed until their owner interacts with them, leading to the products to become stuck in storage and preventing their recirculation.

Another pathway involved unintentional storage, driven instead by other household practices such as tidying up and decluttering the household. In efforts to make living spaces tidier, miscellaneous products were moved away from the living spaces and displaced in storage, for example when preparing to receive guests or simply because it was convenient or desired to move things out of the way. Over time, this practice contributed to the accumulation of unused products in storage. One participant showed a storage space filled with unused products he had lost control of: “*it has grown over time, what started as a closet with clothes became a mess, as more clothes entered... unfortunately other things ended up here too, lamps and things that we don't currently use*” (13). Similarly, another participant described how winter storage of the balcony furniture had gradually attracted other things, “*it started with a thought that I would keep things for the balcony here, but then I lost track of it, placing things there because I can't think of a better place*” (14). It appears as if the products that accumulated in storage attracted other less frequently used or unused products, contributing to a growing disorder.

The increasing accumulation of stored products created a vicious cycle, making it progressively harder for households to address the many products retained in storage. Many households avoided sorting through their storage spaces and postponed divestment because the task felt overwhelming. Over time, both intentional and unintentional displacement of assorted products led to the unchecked accumulation of unused products, ultimately forming an unmanageable mass that was often ignored or forgotten. This accumulation resulted in stored products becoming invisible to their owners, reinforcing the cycle of accumulation. For many households the sheer mass of unused products would trigger negative feelings, leading them to further

avoid addressing the products retained in their storage, which in turn prevented these products from being recirculated.

4.2.3 Sorting practices

The mass of accumulated products often prevented households from engaging with practices of sorting through the products in storage. Yet, sorting through the unused products to determine what should stay and what could be moved out of the storage is a necessary step in bringing stored products into reuse. Events out of the ordinary were often required to trigger the households to engage in sorting practices, such as moving houses, preparing the household for a new season, or because the storage had reached a breaking point – when the mass of products in storage could no longer be ignored.

When sorting out the storage, the households would generally take a purging approach, completely emptying the space and going through all the products contained within. The idea of doing it as a larger one-time event was a key image in the households' sorting practice, it was often found to bring the households some much-needed relief and instant satisfaction as *“it feels so good to get rid of things because now we can enter the room which we couldn't before”* (11). However, they often found that they *“spent a lot of time in the basement storage, trying to create some kind of order that turns back into chaos as soon as it is done”* with a storage that was *“just as full as before after I cleared out and donated things”* (8). Despite the households' efforts, unused products would continue to accumulate in the storage. These households were often not aware of the constant inflow of products into storage and the accumulation from this inflow of products could not be fixed by a one-time purging effort.

While purging was sought to bring some relief to the households it is important to point out that this purging approach prevents products from being recirculated. This is exemplified by one participant who notes *“when I want to get it done, I want it done now, and then things will disappear in the car”* (3M) as he would drive the products to his local recycling centre. The products that are purged will most often be collected in bulk and driven to the local recycling centre where they are recycled or binned, thus preventing the products from being recirculated to a new household.

4.2.4 Recirculation practices

The household study reveals some traces of recirculation practices – the practices of moving unused products out of the households in ways that bring them into reuse with a new household. Examples of recirculation practices include selling, gifting, or donating products. Households with more established recirculation practices possessed a know-how on how to navigate different divestment channels effectively. For example, they understood that *“things sold at the flea market can’t be expensive”* (5) or that *“there is a trade-off between getting rid of something and maximizing the price”* (3F) which informed their choices on how to recirculate specific products.

The households also employed multiple divestment channels depending on the product. One household explained, *“things that pay well are sold through auction houses, while Facebook Marketplace is good for larger furniture that people close by can buy, and Tradera³ is good for getting a fair price for things we’re unsure of”* (10). Another household described a similar strategy: *“things of second-hand character are donated to a charity shop... other more expensive things are sold online”* (16). These skills in navigating the divestment paths enabled households’ recirculation practices.

However, not all households had established recirculation practices, this was often due to the prevalent image that selling second-hand products is a lot of work or simply not worth the effort. One participant shared, *“when I don’t want it there is no value, so the work of selling it is greater than the benefits, and I don’t feel like dealing with people”* (7). Similarly, another participant admitted *“I don’t think anyone would want it, so I don’t bother putting up an ad”* (5). The effort required to sell products was frequently seen as overwhelming. One participant described it as *“a gigantic project! [...] to photograph, write descriptions and publish the ad, and then you must send the package too”* (8). This burden was compounded by the large quantities of products that would each have to be dealt individually.

In addition to time constraints, selling products also requires a level of availability and engagement that often did not fit into the households’ everyday lives. As one participant explained, it required being *“available on the phone all day and I can’t do that, I’m only available on nights and weekends, and then it becomes cumbersome to do, so one beautiful day they*

³ A Swedish auction platform for selling or reselling products.

will go to the recycling centre instead” (17M). This mismatch, in combination with the image that selling items was demanding, inconvenient, and unpleasant, often led to products being binned or recycled rather than being sold to be reused.

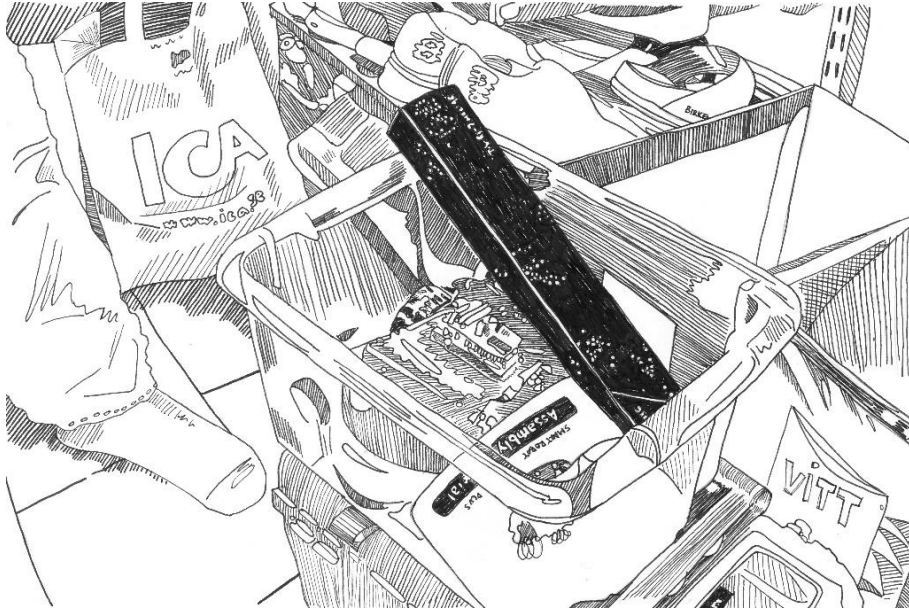


Figure 12. The divestment box found in household 10

In contrast to the purging strategies, households with established recirculation practices took a different approach. Instead of larger, all-at-once efforts, they engaged in small but frequent efforts to sort out and divest unused products. These households designated specific spaces, such as the *divestment box* illustrated in Figure 12, for items they intended to divest and recirculate. Once a sufficient number of unused products had been gathered the household would make efforts to divest and recirculate the products. One participant described how he would “take photographs and post ads of the things all at once, and then the things are sold and can be sent at the same time” (10), making the process more manageable. Another participant followed a similar strategy, saying “I collect things in boxes, things that I’m bringing to the flea market next summer; I do that every other year” (2). These strategies divided the work over time, making divestment easier and ensuring that unused products could be successfully recirculated.

4.2.5 Consequences of practices

In summary, recirculation was challenging for households due to everyday practices that contributed to the accumulation of unused products in storage. Purchasing practices driven by images of finding treasures or bargains led to an unplanned inflow of products that often moved directly into storage. Practices of tidying and decluttering, motivated by images of having an orderly home, further contributed to the accumulation of unused products.

Households engaged in both intentional and unintentional storage practices, each contributing to the accumulation of products in storage. Intentional storage involved organising products into orderly boxes, while unintentional storage practices resulted in disorder and clutter in storage. In both cases, products often became lost and forgotten. Households would often cope with the things in storage by ignoring the mass or expanding storage spaces to enable more orderly storage, again order was a key image driving their practice.

Once products accumulated in storage, households often found it difficult to address the accumulated mass. Engaging in sorting practices, in which the household would go through the products in storage, was rarely performed and often required a crisis of routine to initiate. When the households did engage in the sorting practice it was often by purging storages completely, with the bulk of purged products being sent to the recycling centre or to landfill, rather than being recirculated.

Finally, recirculation practices required skills in determining the value of a product, identifying suitable divestment paths, and finding appropriate recipients. However, recirculation practices did not easily fit into the households' everyday lives, and images about selling products being effortful and unpleasant further contributed to preventing products from being divested in a circular way.

4.3 Synthesis

Papers 1 and 2 shed light on how the person-product relationship complicates divestment, leading to their retention of specific products. Paper 3 highlights various household practices that support or prevent the recirculation of unused products from a household perspective. But how do the two perspectives – the person-product relationship perspective and the household practices perspective – relate to one another? And can the two perspectives together provide new insights as to why unused products are retained in households?

There are some phases in a product's journey, as it moves through a household, where the two perspectives appear to converge, where barriers stemming from both the divestment decision and household practices add to one another in ways that further complicates the divestment and recirculation of unused products. This negative synergy becomes especially apparent when a product transitions into or out of storage.

As previously described, a product's movement into storage can be unintentional, as practices of tidying up or decluttering move unused products away from everyday life and into storage. When unintentionally moving a product into storage divestment is often not even considered, as the households' focus is on achieving a clean and orderly living space. Some of the same aspects found to influence divestment decisions may play a part in intentionally moving products into storage. Perceived product benefits, such as potential future usefulness or significance, will make a person more prone to retaining a product in storage rather than divesting it, as the product may become useful or wanted in the future. Similarly, the perception of divestment work or divestment conscience contributes to unused products being moved into storage, as this divestment decision requires little or no divestment work and retains the possibility that the product can be passed along in the future in a way that eases the divestment conscience. In both unintentional and intentional storage, the divestment decisions are deferred to a later time or not made at all which brings the divestment process to a halt and prevents the product from being divested at all.

When moved into storage, the unused products appear to shift in how they are perceived by their owner. Whether the product is intentionally placed in storage or pushed out of the everyday and into one of the many unintentional storage spaces in the household, the product finds its place in storage and

gradually moves into the background. When this happens the products in storage are seen as part of an overwhelming mass rather than as specific products that carry pragmatic or hedonic value for its owner. When engaging in sorting practices, which was often triggered by extraordinary events, the product moves into the foreground, making the individual product visible again. This shift between foreground and background is of significance to recirculation as it highlights two different ways in which a person may view their unused products, as a part of the accumulated mass and as an individual product. These two ways of viewing a product has implications for divestment and recirculation that will be discussed below.

As is presented in Paper 3 I find that many of the households expressed a desire to handle the accumulated mass in storage by purging the storage completely. However, sorting through products in storage brings the products to the foreground again. When this happens the three aspects influencing the divestment decision presented in Paper 2 become apparent. The need to do the right thing by the product, emerging from the divestment conscience, demands that an individual divestment decision is made about the product itself, taking in the three aspects found to influence the divestment decision in Paper 2. In the household study, the households appeared to be torn between these two ways of sorting through their unused products, wanting to handle the mass all at once while simultaneously feeling a need to make intentional and deliberated divestment decisions about each specific item on its own, contemplating the perceived product benefits, perception of divestment work, and divestment conscience.

4.3.1 Consequences of the combined perspectives

In conclusion, both perspectives – the person-product relationship perspective and the household practices perspective – provide valuable insights into why unused products are retained in households. Some of the barriers preventing recirculation can be found in the divestment decision about individual products whereas others have more to do with handling the mass of products that are part of and flow through the household.

Together these perspectives highlight the conflict that households are faced with, as they are torn between wanting to handle unused products in bulk and having to make individual divestment decisions about each of the products that are part of the mass. When the households are torn between these two ways of sorting out and divesting their unused products, they often end up doing nothing at all, as the barriers to deciding on each product individually can be overwhelming, and addressing all products collectively requires additional effort. Furthermore, even if a decision to divest a product has been made, the subsequent work of following through might still prevent the product from actually being recirculated. Therefore, to effectively support households in recirculation, it is essential to consider barriers from both perspectives in combination.



5. Discussion

The following chapter aims to relate the findings presented in this thesis to the research questions as well as other relevant research to discuss my contributions. Following this, design opportunities based on the identified barriers will be presented, exemplifying how design could address the multiple barriers that prevent households from bringing unused products out of storage and into reuse with a new household. Finally, I reflect on the methodology and discuss future work.

5.1 Key findings and contributions

In this thesis, I aimed to contribute to the existing knowledge on household product retention by answering the main research question; Why are unused products retained in households, as opposed to being divested? When answering this question, I emphasise divestment that brings products into reuse with a new household, as this is the underlying purpose of this thesis. The answer to this question is that unused products are retained because of the barriers that prevent households from divesting and recirculating their unused products. These barriers stem from the person-product relationship and household practices, but barriers from these perspectives combined further complicate households' recirculation of products (Table 1).

Table 1. The identified barriers found in each perspective

Person-product relationship	Combined perspectives	Household practices
<p>Perceived product benefits:</p> <ul style="list-style-type: none"> - The risk of losing a product one wants or needs at a later time - The difficulty to evaluate future needs <p>Perception of divestment work:</p> <ul style="list-style-type: none"> - The large effort that one believes to be required to divest a product <p>Divestment conscience:</p> <ul style="list-style-type: none"> - Wanting to do the right thing, by the product, other people, and the environment 	<p>The negative synergy between wanting to purge the accumulated mass all at once while simultaneously feeling a need to make intentional and deliberated divestment decisions about each specific item individually.</p>	<p>Barriers that contribute to unused products accumulating in storage:</p> <ul style="list-style-type: none"> - Unplanned inflow of surplus products - Purchasing practices are disconnected from sorting and recirculation practices - Households engagement in tidying and decluttering practices <p>Barriers that prevent unused products from exiting the storage in circular ways:</p> <ul style="list-style-type: none"> - Storage practices that hide products in plain sight in storage Sorting practices are postponed, because the accumulated mass is overwhelming - Sorting practices of purging the storage, an all-at-once and infrequent effort - Images about selling products being effortful and unpleasant - Recirculation practices require new skills and compete with other household practices for time and space

Starting with the first perspective I take in this thesis, looking at the person-product relationship, three main aspects are found to influence an individual's retention of a specific product:

- Perceived product benefits

Many unused products are retained rather than divested for their perceived product benefits. This is because their owner does not want to risk losing a product that they would want or need at a later time, but also because they find it difficult to know who they will be in the future – which makes it challenging to evaluate the future use of the unused product. In relation to past research on product retention these aspects are not novel. The pragmatic and hedonic dimensions of perceived product benefits align closely with previous research on product attachment (Dommer & Winterich, 2021; van den Berge et al., 2021). Furthermore, research has shown that that value assessments of products play a key role in divestment decisions (Haws & Reczek, 2022).

- Divestment conscience

Unused products are also retained because of the owner's divestment conscience, as they want to do the right thing by the product, other people, or the environment. The notion that some divestment options are more appealing because they are perceived as easier on the conscience has been indicated in studies such as those by Sarigöllü et al. (2021) and Simpson et al. (2019). This finding provides a part of the answer to the research question. The desire to do right by the product, divestment conscience, was found to play into the divestment decision, often complicating or preventing divestment of products. Previous research has found that knowing that the product will come to a good home can ease divestment (Brough & Isaac, 2012), but I find that it is just as important to ensure that the product would be used at all rather than thrown away or recycled.

- Divestment work

Finally, findings from the person-product relationship perspective emphasise the perceived divestment work required for divesting a specific product. This too provides an answer to why unused products are retained rather than divested, as the divestment work of moving the product along is expected to be too effortful. While general consumption work has been identified as a consequence of circular economy (Hobson et al., 2021), defining this aspect and exploring its intricate relationship

with the other aspects, how the perceived divestment work together with the perceived product benefits and divestment conscience influence divestment decisions, is a primary contribution of this thesis.

From the second perspective that I take in this thesis, looking instead at household practices, I identified additional barriers that further complicate divestment. My analysis from the practice perspective finds that unused products are retained rather than divested because of the practices that move products into storage and leading to a mass of products accumulating. The mass of unused products has consequences for recirculation, as it ties up items that could otherwise become resources in a circular economy. Additionally, the sheer volume of accumulated products acts as a barrier, preventing households from sorting through items in storage and bringing them back into use.

That products move from the living spaces into storage is commonly found in previous research (Cwerner & Metcalfe, 2003; Löfgren, 2014; Suarez et al., 2016). I found that accumulation of unused products in storage was often driven by tidying and decluttering practices in the households, similarly to the practices of dispersal and displacement found by Cwerner and Metcalfe (2003), which move products into storage in less intentional ways and contributes to increased disorder and clutter. I provide one contribution that adds to the current knowledge about how things move into storage, as I highlight how purchasing practices driven by the image of finding treasures contributes to moving products directly into storage. In exploring how household practices interconnect with one another, I also find that the missing link between purchasing practices and sorting and recirculation practices also contributes to products accumulating in storage, as the flow of products moving into the households is often not matched by the outflow of unused products from the household.

Another key finding from the practice perspective is the practices that prevent products from being brought out of the storage in a circular way. Attempts at divesting products in ways that bring them into reuse are often counteracted by the ease of convenience of current waste streams (Gregson et al., 2007b) which better fit in with current practices of sorting and divestment, for example the purging approach, as well as into the households' everyday lives. My findings add to this contribution by illustrating the different practices that prevent people from divesting products in ways that

bring the product into reuse with a new household, beyond the current system of waste management.

Löfgren (2014) notes that people spend large amounts of energy and resources to handle the abundance of things in their homes. I find that efforts to address unused products were often through engaging in storage practices that move unused products into ordered boxes. Orderly storage, however, contributes to the accumulation of products in storage, as the order hides the products in plain sight (Gollnhofer et al., 2024). Dealing with the accumulated mass of unused products in storage was often perceived by the households as an overwhelming task. One reason for why it is difficult to clear out the accumulated mass is provided by Gollnhofer et al. (2024) who argue that it is because people address the mess by attempting to order it, seeing it as an issue of things being out of place, rather than addressing it as an issue of having too many possessions. This is mirrored by the frequently recurring image of having an orderly storage that emerged in my analysis as well as by Löfgren (2014), who finds that households dream of becoming better organised. The image of having an orderly storage, is contraproductive as it contributes to products accumulating in storage.

I also contribute with an additional explanation to why households find it challenging to address the accumulated mass, stemming from the way in which sorting practices were performed. Many of the households held the image that sorting should bring instant relief and be a one-time larger effort, which led many households to purge their storage completely when sorting it out. This way of approaching the accumulated mass is frequently recurring in popular literature, for example “start by discarding, all at once, intensely and completely as is suggested by Marie Kondō (2014). However, this approach was found to be challenging because the accumulated mass of products in storage was perceived as overwhelming, and purging the mass would require significant work and effort. This is a relevant contribution in regard to the aim of moving products into reuse, as the purging efforts are found to move products into the waste stream or recycling rather than bringing products into reuse.

Finally, I find that products were prevented from being recirculated because of the images that many households shared about selling products being an effortful and unpleasant task. But also, because recirculation practices require the skills of choosing the appropriate divestment path as well as finding an interested recipient to take over the products. Further, I find that

recirculation practices competed with other household practices of work, leisure, and family, for time and space, preventing them from being performed.

One main contribution that I make is bringing the two perspectives – the perspective of person-product relationship and the perspective of household practices – together. This contrasts with the perspectives taken in previous research, that has been either focusing on the person-product relationship or household practices. While both perspectives are true for households, they become more or less prominent as households were torn between wanting to handle their unused yet retained products as a mass, as was found in the sorting practices, while at the same time feeling a need to make divestment decisions about each individual product, which is complicated by the barriers found from the person-product relationship. These two ways of handling unused yet retained products illustrates different types of divestment work that are required by the households to recirculate their unused products. Households have to handle the mass of products in storage, work that is often insurmountable. They also need to make divestment decisions for each individual product that is part of the mass as well as recirculate each product individually, a task that can be challenging enough on its own for a single product, let alone the mass of products that is often purged. Thus, the synthesis answers Hobson et al. (2021) call for a multifaceted understanding of consumption work, by shedding light on the different types of divestment work that is required to move products out of storage and into reuse.

To summarise, these findings provide insights into what recirculating products entails for households in everyday life, highlighting various barriers that hinder households from divesting unused products in ways that bring them back into reuse, leading to unused products being retained in storage. This contribution is important as insights about barriers and enablers of recirculation practices in everyday life are critical for shifting current consumption trends, designing solutions that match households' everyday life and support circular practices, and ultimately moving towards a circular society (Greene et al., 2024; Selvefors et al., 2019).

Finally, it is notable that in many of the households the practices of sorting and recirculation were not part of everyday life, but rather something that would be done rarely. Divestment appeared to be in the back of their mind and households needed a trigger to address the accumulated mass of products in storage (Haws & Reczek, 2022). This is echoed by Gollnhofer et al. (2024)

who call for deliberate and strict ruptures from routines to help people gain advantage in their struggle over disposal of their possessions. Events such as moving houses or preparing for the seasons changing were frequently mentioned as necessary triggers to bring the households to divest their unused products. Interestingly some of the participants mentioned that they saw their participation in the study as a catalyst for divestment. One way to help the households with taking the steps to address the accumulated mass of unused products in storage and to support them in divesting the mass in a circular way could be achieved by design solutions.

5.2 Design Opportunities

The papers presented in this thesis highlight that participants want to recirculate their unused products, as is made evident by the divestment conscience presented in Paper 2 and the participants general sentiment presented in Paper 3. However, there are multiple barriers preventing households from divesting and recirculating their unused products. While design has not been the primary focus of this thesis, I attempt to translate the barriers presented in this thesis into design opportunities that could support and enable the recirculation of unused products, as I recognise the important role that design plays in supporting transitions towards sustainable and circular consumption.

That perceived product benefits influence the divestment decision aligns closely with previous research on emotional attachment (Dommer & Winterich, 2021), and value assessments are key to disposition decisions (Haws & Reczek, 2022). One obvious design opportunity is to emphasise the perceived product benefits to encourage attachment and retention of products to keep the product in use, as previous research has suggested (Mugge et al., 2005; Schifferstein & Zwartkruis-Pelgrim, 2008; van den Berge et al., 2021). But in doing so it is crucial to design in ways that prevent products from moving into passive use, being used instead as a decorative object or stored away, as is often the case with these products (Kowalski & Yoon, 2022). One could also counteract the perceived product benefits by designing instead to support detachment as the product moves out of use. For this Poppelaars et al. (2020) present several interesting design strategies, such as holding the user by the hand to say goodbye and ensuring that the users act on their divestment decision. Finally, there is an opportunity to design solutions that support households in evaluating whether to retain a product or not, as the perceived product benefits are often uncertain and hypothetical. One such

example is given by Marie Kondō (2014) who suggests asking the question “*does it spark joy?*” when sorting through products in storage. The need for support with evaluating the perceived product benefits was especially noticeable with the products that were *nice to have* but did not necessarily have any relevance for the household in the future, as it was difficult for many participants to reach the conclusion that these products would not be used again.

The divestment work associated with recirculation was a barrier to divestment for many of the participants in the studies. Alleviating divestment work could make it easier for households to recirculate unused products rather than storing or throwing products away. This could be addressed by designing services that better fit with the current sorting and divestment practices found in many of the households. For example, many of the interviewed households took a purging approach to divest – wanting to sort out and divest all products at once. The current infrastructure for recycling and throwing away products supports this approach, as it is easy, or even demanded, to throw away things in a bulk at the waste management or recycling centres. However, solutions that support a purging approach to recirculating products are few. One such example is Sellpy⁴, a service that many participants mentioned in the household study, noting that it allowed them to divest things in bulk without having to do the work of selling each item individually. While items recirculated with this service still had to be sorted out of the storage it did relieve the households from the divestment work of putting up ads, dealing with buyers, and sending products that were sold. Finally, the products themselves could also be better equipped for recirculation and reuse, as exemplified in the Use2Use strategies products could be designed to be easier to clean, re-package, or modify for different users (Selvefors et al., 2019).

Another design opportunity is to alleviate the household’s divestment conscience, by addressing the feelings of responsibility that the household felt towards the product, but also towards other people and the environment. This could be done by designing services or infrastructure that confirms to the owner that divestment will bring the product into use and a *good home*. By enhancing the feeling that the product reaches the *right person* and

⁴ A Swedish second-hand service that resells used clothes on commission, they are in charge of all reselling activities from creating the adds to handling the payment and delivery.

emphasising and informing about the societal and environmental benefits of recirculating products the households' divestment conscience could be harnessed as a driver for recirculation rather than letting it become the reason why some products remain in storage. For example, when gifting unused products to friends or family, as was often the case with children's clothes, participants would often receive confirmation that they did the right thing as they received gratitude from the recipient. Some participants even mentioned receiving pictures of how the gifted item was used in its new home which enhanced the feeling that they had done the right thing.

How unused products were stored was often a barrier that prevented sorting practices and recirculation practices. One design opportunity that could address this barrier is supporting storage with intent, to prevent products from accumulating in storage and becoming overwhelming to handle at a later stage. This is contrary to the storage solutions that are presented to households today, that emphasise larger and more orderly storage spaces. However, intentional storage of products becomes challenging as keeping things in the right place often makes the product become invisible to its owner. Therefore, we could design solutions that help households address untidiness in the storage as well as the clutteredness (Gollnhofer et al., 2024). Such a solution could make use of implementing triggers that prompt the household to act on sorting out their storage, as was found to be needed in Paper 3. It could also be done by organising the products by if or how the product was to be divested, rather than by what category of product it is. It is naïve to believe that storages could be completely emptied as clutter is inevitable when living with things and products are constantly moving into and out of use (Cwerner & Metcalfe, 2003; Löfgren, 2014). Therefore, design solutions that supports inventory management or an awareness of the things that are kept in storage would benefit the products that are still stored, to prevent products from becoming invisible and lost in storage. However, this would likely add to the work required by the household.

Recirculation practices require new skills, such as knowing how and where to divest certain products and with finding a recipient to take over the product, as well as the adoption of new divestment paths, as is presented in Paper 3. Designing new or introducing current infrastructures for product recirculation that fit into the households' everyday lives could help households develop more functioning recirculation practices.

Finally, considering current sorting and divestment practices when designing new solutions for recirculation is necessary. As is pointed out in the synthesis it is important to support both the purging of products from the storages that are filled to the brim as well as the divestment decisions of individual products which the households need to make, because both are required to move products out of the storage and into reuse. For this, inspiration can be found in the divestment boxes that some households successfully employed to recirculate their unused products.

5.3 Reflection on method

This thesis is based on two different studies aimed at understanding why unused products are retained in storage rather than recirculated. One factor that may have influenced the results of these studies is the recruitment of participants for the studies. In the diary study, which Paper 1 is based on, the majority of participants were women between the ages of 20 and 45. They all shared an interest in the topics of sustainability and circularity, which is unsurprising as they were recruited from social media groups focused on these topics. The household study, which forms the basis of Paper 2 and 3, had a more balanced gender distribution. Similar to the diary study, many of the participants in the household study expressed positive attitudes towards reuse and circularity, with most of them stating that they wished to recirculate their unused products. Including participants with more negative attitudes to product recirculation might have highlighted additional reasons to why unused products are retained in households. However, it is important to note that the participants from both studies still retained a large number of unused products in storage and struggled to divest and recirculate them, suggesting that a positive attitude to recirculation alone is not enough to facilitate reuse.

Another important question to consider is whether the household study provided an accurate representation of the households' everyday lives. The household study was conducted in the participants homes, ensuring that the interviews took place in a relevant context. This setting allowed the participants to explain and demonstrate various aspects of their storage spaces and the products that were retained within, as they guided us through their homes. While the household study may not have captured a complete picture, as a few households chose not to show us certain storage spaces in their home, and others may have cleaned and organised the storage a bit before the visit, it most likely showed an honest picture. Most of the storage spaces observed were probably in their natural state and had not been curated

in advance. This is supported by the various portraits of storage spaces presented in this thesis, which illustrate the contexts in which some of the household studies were conducted.

5.4 Future work

One key question that has followed me throughout the studies and in writing this thesis is how to define the concept of *unused*. Neither of the studies included in this thesis had predefined the concept of unused. Instead, this was left to the participants to determine for themselves. Because of this, the household study included a variety of products ranging from products that were rarely in use, to products that were no longer in use or that had never been used. In reflecting on the methodology this was beneficial for the household study, as it brought forth reflections from the participants about what it meant for them that a product was unused. However, determining if a product was unused still remained a challenge for many of the participants, which is a necessary step in order to divest and recirculate a product.

Perhaps this definition is challenging to make because products are not static and there is no clear boundary between used and unused. Gregson (2023) suggests products should instead be considered in terms of idleness, as many of the products we own are only used for limited periods, remaining idle in between. Löfgren (2014) describes products as objects that move through both our homes and lives, arguing that they shift in form and reassemble in this movement. Similarly, Cwerner and Metcalfe (2003) conceptualise the home as a dynamic space through which people and products move. They note that objects are nomadic in their movements within the household, not only physically but also temporally, as they can shift between being considered “*in place*” and becoming clutter while occupying the same physical space. This perspective provides an important context for understanding how products are gradually moved away from everyday life and into storage.

This could also contribute to explaining why households have a hard time divesting their unused products, as this fluidity makes it more complex to determine whether their product has become unused, which I believe is an important component to trigger the household to make a divestment decision. Thus, the understanding the different meanings of unused is an interesting avenue for future research.

The main aim of this thesis is to contribute to the existing knowledge about why unused products are retained in households' storage rather than being recirculated. However, I approach this question with an enabling design stance, hoping to contribute with design opportunities that can support household with divesting and recirculating their unused products. The design opportunities outlined in this discussion are based on deep and holistic insights about household divestment. These opportunities, however, are still only hypothetical and described on a very high level. While they capture and formulate the barriers to recirculation presented in this thesis in more actionable ways it is still unknown if these opportunities will support a shift towards increasing recirculation of unused products. To understand how design can support recirculation these opportunities must be further developed into actual design strategies which, in turn, should be tested with households in an everyday life context.

Finally, if these insights and design opportunities can support households with moving their unused products out of the households, we then need to consider the consecutive step. To recirculate a product the households divesting their unused products need to be connected with a circular consumer who is willing to take over the product. While this has not been the main focus in this thesis, the question of finding a new owner to unused products has come up in parts of the study, especially in Paper 2 where finding a recipient was considered challenging in terms of the required divestment work. However, finding the right recipient was important in alleviating the divestment conscience. One alternative pathway is donating one's unused products to a charity shop or using a service that sells the product for you, such as Sellpy, which brings the product out of the home with a potential to become reused. However, there is no guarantee that the product will actually become reused in a new home because the work of finding a new owner to the product still remains. Connecting the divesting households with a recipient is an important next step in closing the loop and supporting a transition towards circular consumption. How can we support households recirculating products with finding and connecting with a circular consumer in need of the product they are offering?

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