



Exploring rebound effects in Access-Based services (ABS)

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ABSTRACT

In an effort to gain expanded insights into the dark side of the sharing economy, the current research investigates direct and indirect negative rebound effects, or sustainability issues, created by users of access-based services (ABS). An initial analysis of 31 interviews of ABS users in the clothing industry reveals multiple, different (in) direct positive and negative rebound effects; it also indicates the relevance of considering the beneficiary (self or others) and suggests several potential underlying psychological concepts. Next, a segmentation study with 499 ABS-users establishes five consumer segments that exhibit varying levels of direct, indirect, positive, and/or negative rebound effects. Two distinct psychological patterns emerge that are associated with negative rebound effects. Ultimately, the findings challenge the assumption that ABS unequivocally and consistently drive positive behavioral adjustments. Instead, a non-negligible portion of ABS consumers exhibit increased consumption, with detrimental environmental implications.

1. Introduction

Sharing economy options, such as access-based services (ABS), are already well-established in several industries, such as ride sharing (PwC, 2015), and also are rapidly spreading to other product categories (e.g., clothes) (Felsted and Halzack, 2019; Jain et al., 2022). Defined as “market-mediated transactions that provide consumers with temporarily limited access to goods in return for an access fee, while the legal ownership remains with the service provider” (Schaefer et al., 2016a, p. 3), these services are available in a range of contextually situated consumption settings that differ in their access temporality, anonymity, and products (Bardhi and Eckhardt, 2012). Furthermore, ABS take various forms, including renting (Moeller and Wittkowski, 2010), or “a transaction in which one party offers an item to another party for a fixed period of time in exchange for money and in which there is no change of ownership” (Durgee and O'Connor, 1995, p. 90). Arguably, these consumption practices should mitigate environmental impacts, by optimizing people's uses of existing resources, such as unoccupied apartments, available vehicles, and high fashion garments (Meshulam et al., 2023). On the supply side, ABS also may create incentives for manufacturers to design more efficient products and close the material cycle, then encourage consumption practices that increase their

products' utilization capacity, reduce waste, and optimize their lifespan (Tukker, 2015). Intuitively, accessing, rather than acquiring, is more environmentally friendly (Merino-Saum et al., 2023).

Yet consumer adoption of ABS also could have unexpected negative consequences, especially if the way that customers use the offerings and adapt their general consumption behaviors offset the environmental gains that result from sharing tactics. Thus, the question of whether ABS ultimately enables or detracts from sustainability remains unsettled, and the answer likely depends on how consumers actually behave (Merino-Saum et al., 2023).

In this sense, we note that the various forms of ABS can have diverse influences on consumer behavior (Meshulam et al., 2023). For example, perhaps the convenience and cost savings offered by ABS stimulate more demand and increased expenditures, resulting in greater overall consumption, compared with a scenario in which ABS is absent (Gong et al., 2017). Access rights also may reduce consumers' concerns about a product's usable lifespan or resale value, such that they might adopt careless product use (see, for example, Ackermann and Tunn, 2024 in this special issue) or less conservative usage behaviors, such as aggressive driving of rental cars that increases fuel consumption (Bartolomeo et al., 2003). If ABS increases consumers' use and purchase of products (Binswanger, 2001), it would represent a potential threat to

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environmental benefits, as examined by the environmental rebound effect framework (Font Vivanco et al., 2016). When environmental benefits are less than anticipated, negative rebound effects arise (Kjaer et al., 2016), whereas environmental benefits that are greater than expected induce so-called positive rebound effects (Saunders, 2008; Truelove et al., 2014). In a systematic literature review of empirical studies of environmental performance in the sharing economy, Meshulam et al. (2024) determine that only half of the studies indicate better environmental performance compared with conventional consumption modes; 34 % of these articles identify worse environmental performance, and the remaining 16 % report mixed results.

The existing research on sharing economy rebound effects also tends to prioritize economic factors (i.e., income and substitution effects) that can lead to rebound effects at the consumer level. We find few considerations of social or psychological factors that could induce consumers to engage in different behaviors (Reimers et al., 2022). Yet it is critical to move beyond a simple economic focus if we hope to understand the complexity of rebound effects and discourage consumer behaviors that create negative environmental impacts. Therefore, in line with Eckhardt et al.'s (2019) call for research and the focus of this special issue on the dark side of the sharing economy (Schaefer et al., 2021), we explore the different types of ABS rebound effects and their potential heterogeneity among ABS users, in an effort to determine if and why negative rebound might be more or less prevalent among specific segments of ABS users. Rather than gauge specific environmental metrics (e.g., energy use, carbon emissions), we also consider behaviors that are likely to produce positive or negative environmental impacts overall (Nash et al., 2017). For this study, we define “behaviors” as concrete actions or intentions to purchase products in the same category or in other categories, unrelated to the focal ABS (i.e., clothing for this study). Our analysis thus involves both direct and indirect effects of ABS adoption. If renting clothing leads consumers to buy fewer clothes (direct positive rebound effect), they might redirect the related saving to purchase more products in other categories (indirect negative rebound), for example.

To explore such rebound effects, we conduct two studies. Starting with a qualitative study, we combine desk research, 31 in-depth interviews, and two case studies in the clothing industry to conduct an initial exploration of how consumers behave in relation to an accessed product category (direct rebound) and other product/service categories (indirect rebound). We seek to identify occurrences of positive and negative rebound effects and some potential underlying socio-psychological mechanisms. These findings reveal the relevance of a specific social factor, namely, the difference between purchasing for oneself versus buying for others. They also suggest a set of relevant psychological constructs that we leverage to inform our analysis in Study 2. Thus in Study 2, we conduct a segmentation study of 499 French users of clothes rental services to explore heterogeneity among them and assess the relative prevalence of positive versus negative and direct versus indirect rebounds, when buying for oneself or others. We thus identify five segments of ABS users, on the basis of their behaviors, two of which exhibit negative rebound effects. In turn, we can establish the socio-demographic and psychological characteristics of renters in these two segments.

In direct contributions to research pertaining to environmental rebound effects (Zink and Geyer, 2017) and the sustainability implications of the sharing economy (e.g., Merino-Saum et al., 2023), we find that consumers' behavioral responses to ABS might reinforce or threaten expected environmental gains of ABS among specific segments of users. Furthermore, we identify a novel social factor (beneficiary of the rebound effect) and two distinct psychological routes that underly the observed negative rebound effects. In turn, we affirm the need to adopt relevant and specific approaches to investigate the drivers of (Akbar and Hoffmann, 2018) and barriers to (Hazée et al., 2017) ABS. Notably, previous studies have not explored negative rebound effects as a potential barrier to ABS adoption (Merino-Saum et al., 2023), which represents a key gap in our understanding of the influences on consumers'

decision to engage in sharing practices. Finally, in addition to clarifying consumers' intentions to engage in this form of consumption (Lang and Armstrong, 2018; Niinimäki and Hassi, 2011), we provide practical insights for marketers in the clothing industry (Lee and Chow, 2020; Research and Markets, 2019), for which rental services arguably represent the “future of fashion” (Braithwaite, 2018). Both managers and policy makers can leverage our findings in their efforts to enhance the environmental potential of ABS; we also specify certain segments of renters who need particular attention to limit their negative rebound behaviors, if the goal is long-term sustainability.

2. Theoretical foundations

2.1. Rebound effects

Research on rebound effects acknowledges that they might reflect negative changes or positive shifts (Binswanger, 2001; Greening et al., 2000; Roy, 2000; Smeets et al., 2014). In particular, rebound effects are negative (positive) if a technological change or improvement entails negative (positive) changes in behavior, which counteract (reinforce) the benefits of the initial improvement, leading to ultimate impacts that are worse (better) than expected. We focus specifically on environmental rebound effects (Font Vivanco et al., 2016; Meshulam et al., 2023), which include indicators that go beyond energy and energy-related emissions (i.e., energy economics) and encompass all “the environmental consequences from changes in demand triggered by efficiency improvement due to technological changes” (Font Vivanco et al., 2016, p. 61). Such changes might refer to resource (time, cost, space) savings, alterations to the skills needed, or socio-psychological changes (e.g., attitudes, values); they might result in income, substitution, or re-spending effects (Font Vivanco et al., 2016).

Rebound effects also can arise at the macro or micro level (Meshulam et al., 2023). For example, at the macro level, a more efficient technology might result in less-than-expected savings or increased energy consumption throughout an economy, as when environmental improvements do not achieve predicted efficiency- or sufficiency-induced savings (Santarius and Soland, 2018). At the micro level (Greening et al., 2000), a *direct rebound* refers to the environmental impact in the same category after a switch to more efficient products or services (Chitnis et al., 2013). Energy-efficient light bulbs lower the costs of lighting services, which could encourage households to leave lights on longer, use more bulbs to enhance the amount of light, or increase the luminosity purchased (Schleich et al., 2014). *Indirect rebound* instead involves changes in consumption in other categories; the money a household saves on fuel by adopting an electric vehicle may be assigned to the vacation budget, prompting a splurge on overseas holidays that require more energy to provide (Sorrell, 2010), or it might enable the purchase of more durable versions of other products (cf. low-cost, disposable products) that require less energy to operate.

Explanations of negative rebound effects are mostly based on income or substitution effects (Greening et al., 2000), in that increased disposable income resulting from enhanced energy efficiency allows consumers to save money that they then spend on other goods and services. Yet if disposable income decreases, it also could evoke a positive rebound (Font Vivanco et al., 2014), such as when consumers who purchase a battery-powered vehicle limit their consumption in other categories, because they devote more of their income to obtaining the relatively more expensive technology (cf. internal combustion cars).

2.2. Rebound effects in ABS

Prior research has established several influences that can encourage or hinder customers' willingness to adopt ABS (for a recent systematic review, see Merino-Saum et al., 2023; for a systematic, thematic review, see Jain et al., 2022). Merino-Saum et al. (2023) group these drivers and barriers into eight broad categories: environmental, social, economic,

functional, hedonic, ownership-related, trust-related, and familiarity. Specific examples of barriers include service complexity (usage, understanding, accessibility), the reliability of the service provider, risk of contamination, concerns about being held responsible for product usage, a lack of compatibility with previous experiences, social norms, lifestyles, and image effects (Hazée et al., 2017). The various drivers include, for example, cost savings (income effect), substitutability between ownership and access (Möhlmann, 2015), convenience (Moeller and Wittkowski, 2010), unique products (Akbar and Hoffman, 2018), and support for trend orientations or variety-seeking (Kim and Jin, 2019). As an alternative to non-consumption (Schaefers et al., 2018), ABS grants consumers access to the latest products (Moeller and Wittkowski, 2010), which they otherwise might not be able to afford (Möhlmann, 2015). When ABS adoption reflects a desire for these benefits, it thus might favor unsustainable behaviors and negative rebound effects. Yet strikingly, we notice that prior literature ignores the possibility that environmental impacts could emerge as a barrier; the only considerations of environmental impacts that we find involve their role as potential drivers of the use of ABS (Merino-Saum et al., 2023).

Turning specifically to direct rebound effects in ABS, which involve changes in consumer demand for new products in the same category, whether purchase or accessed, we note that buying new products in addition to the accessed products might (partially) offset the positive environmental impact created by ABS, due to imperfect substitution (i. e., ABS fails to compete with primary production; Zink and Geyer, 2017). Buying rented products before their access-based end-of-life—an option regularly offered by ABS providers—also has relevant implications. If a rented product is sold, it cannot simultaneously be shared among multiple renters on a regular basis. The rebound effect then is negative, due to the foregone benefit, compared with the benefit expected from optimizing resource capacity (Figge and Thorpe, 2019) (unless the person who buys the product uses it an inordinate number of times). Furthermore, by selling products, the ABS provider loses track of them and has no influence over whether they become waste rather than being recycled, for example (Semba et al., 2020). In contrast to direct rebound effects, indirect rebound effects relate to consumers' aggregate demand for other goods (Binswanger, 2001), such that ABS adoption may affect patterns of consumption for products and services in general. People might increase their consumption (negative indirect rebound effects) due to a saving effect (Greening et al., 2000) or exhibit a qualitative change in consumption (positive indirect rebound effects) that indicates a re-spending effect (Zink and Geyer, 2017). If the prices of other commodities remain constant, both of these effects imply that ABS reduces consumers' budgets for the focal category, so they have more money to spend on goods and services in other categories (Thiesen et al., 2008) or to purchase the same amount but in better quality. The former result implies an overall increase in demand and environmental burdens (Makov and Font Vivanco, 2018); the latter response could have a positive environmental impact (e.g., more expensive products with more durable materials or produced locally).

Overall, studies into negative rebound effects are sparse (Meshulam et al., 2024) because much of the research on the environmental effects of ABS tends to rely on an eco-design (versus consumption) view, emphasizing "the systematic incorporation of environmental factors into product design and development" (Tukker et al., 2001, p. 148). From this perspective, ABS reduce environmental impacts (Tukker, 2004) through digitization and servitization (Mont, 2002; Sundin and Bras, 2005) and by limiting resource use and waste, because fewer products get manufactured and require fewer materials per use (Manzini et al., 2004). Additionally, to reduce maintenance or repair costs, providers have incentives to develop durable products with low maintenance costs and longer lifespans. In product categories with resource-intensive uses, effective maintenance and efficient operations can significantly reduce the amount of resources consumed (Kjaer et al., 2019). ABS can also facilitate the reuse or recycling of product components, because the mechanisms for improved environmental sustainability generally reflect

engineering activities (e.g., design, recycling, maintenance, holistic planning, operation; Lindahl et al., 2014; Peruzzini and Germani, 2014).

But we argue for a consumption perspective, considering the potentially negative behavioral consequences of consumers' adoption of ABS on the environment. On the one hand, ABS implies values other than possession, so it should reduce some negative environmental outcomes due to consumption (Kang and Wimmer, 2008). In this sense, ABS is a form of anti-consumption (Ozanne and Ballantine, 2010); Belk (2010) even predicts that access reduces product ownership. It diminishes uses, compared with the corresponding uses of an owned good, so consumers may seek to replace owning with accessing, at least partially (Schaefers et al., 2016b), and decrease their overall product ownership (Fritze et al., 2020). Furthermore, ABS might correlate positively with other pro-environmental behaviors (Bocken et al., 2018). On the other hand, ABS can increase the number of services provided and goods consumed (Kjaer et al., 2016, 2019), by creating opportunities for increased consumption or product misbehavior (Bartolomeo et al., 2003), ennobling the ephemeral, emphasizing the value of novelty above sustainability (Robert et al., 2014), evoking materialism, and speeding up product replacements (Bardhi and Eckhardt, 2017). Consumers' consciousness of access-based consumption does not automatically lead to reduced acquisition or overconsumption either (Seegebarth et al., 2016).

Existing research into the environmental impacts of consumers' adoption of ABS also prioritizes monetary mechanisms (e.g., cost-savings effects), without sufficiently addressing the non-monetary mechanisms (e.g., socio-psychological factors) that may underlie rebound effects and affect environmental outcomes of the sharing economy (Font Vivanco et al., 2022; Meshulam et al., 2024).

In an attempt to address this research gap, we study actual behavioral responses of consumers to ABS and investigate the socio-psychological factors that might foster rebound effects, among different segments of consumers, according to the rebound effects that their behaviors create. In Study 1, we adopt a qualitative approach to explore various types of positive and negative rebound effects, and we try to identify some potential underlying socio-psychological constructs. Building on these exploratory insights, we undertake a quantitative investigation in Study 2 with a larger sample of ABS users to explore heterogeneity in the occurrence of rebound effects among these users, as well as to specify some psychological patterns associated with negative rebound effects.

3. Study 1

We adopt a qualitative, case study approach (Yin, 2009), in an effort to capture rich information, and we focus on the clothing industry, due to its relevance to sustainability topics. It is the second-most polluting industry in the world, primarily due to its disposal and fiber production processes (Resta et al., 2016). Making processes more ethical and environmentally sustainable is challenging (Kleinhüchelkotten and Neitzke, 2019), particularly when consumers demand constant novelty at low prices (e.g., fast fashion, Barnes and Lea-Greenwood, 2006). Although renters of clothes do not mention sustainability as prime motives for their behaviors (Jain et al., 2022; Park and Armstrong, 2019), ABS still might be a more sustainable option than purchases. Consumers can feed their fashion appetites but avoid obsolescence and waste (Hu et al., 2019), by increasing the practical service lifespan of the clothes (Zamani et al., 2017) and reducing the quantities of unused, unsold pieces (Shen and Li, 2015). Furthermore, the clothing industry—characterized by low satiable demand, high price sensitivity, and a "see now, buy now" impulse buying culture—is vulnerable to negative rebound effects but also offers great potential to avoid them, by diverting consumers away from primary production (Siderius and Poldner, 2021). Insights into the negative rebound effects of ABS thus may have strategic importance for enabling sustainable growth (Mukendi and Henninger, 2020), particularly in the global clothing market (Statista, 2021a,

Table 1
Study 1 – Case description and comparison.

	Le Closet	Coucou
Creation year	2014	2015
Offer	Online rental of day-to-day clothes; starting at 39€ for the classic offer (2 clothes + 1 accessory) or enhanced offer at 49€ (3 clothes + 2 accessories); delivery and return included	Offline rental of festive outfits (e.g., dresses, pumps, headbands); starting from 35€; delivery and return not included
Temporality	Membership based, up to one-month access, non-binding	One-time transaction, up to 12 days access
Products and brands	New clothes from 40 brands (20 % eco-responsible, with objective to reach 100 % by 2023)	Mostly (80 %) secondhand clothes from premium and luxury brands
Turnover (2019)	6 million €	299,268 €
Revenue stream	Renting, sale of worn clothes from first rent to product service end-of-life	Renting, sale of worn clothes at product service end-of-life, and sale of new accessories created by young local labels
Clients (2021)	25,000	6,000
Target	All women (also pregnant)	25–45-year-old women from Brussels
Market	France, Belgium, Luxembourg, Germany, and The Netherlands	Belgium
Delivery	Eco-responsible, reusable bags	/
Cleaning and maintenance	Dry cleaning (with ecological products); small repairs included	Water cleaning (with ecological products and at low temperature); small repairs included
Product end-of-life	Sold or Slowmod	Sold or Les Petits Riens
Rents per piece	17 times on average	20–40 times

Notes: Slowmod is a French company, created in 2019 to distribute and upcycle secondhand clothes. Les Petits Riens is a Belgian nonprofit association created in 1937 to fight poverty and social exclusion; it collects, sorts, and sells various second-hand objects.

2021b). Finally, renting has gained momentum in the fashion industry but remains at a nascent stage of development and underexplored (Jain et al., 2022).

To select use cases, we adopted a criterion logic and maximum variation method (Patton, 2014). Thus, we seek long-standing ABS located in the same geographical area, so that we can interview consumers with lasting or more recent relationships with the service. Time influences consumers' sense of service appropriation (Mifsud et al., 2015), responsibility for the accessed products (Pierce and Jussila, 2011), and substitutive value (Fritze et al., 2020). Yet the cases also differ in their value proposition, channels, and revenue streams (rental and sales of worn clothes and accessories), to reflect market diversity and increase the generalizability of our findings. The two services, Le Closet and Coucou, both operate in business-to-consumer settings, as detailed in Table 1.

3.1. Data collection

With a multi-source case approach, we aim to increase internal validity (Yin, 2009). On the basis of our literature review, we derived descriptions of the cases in terms of their value propositions, price structures, consumer targets, and environmental performance goals. One of the authors subscribed to both ABS services, to achieve familiarity with both the service providers and customers' activities. In semi-structured, in-depth interviews with customers, we also explored their individual views, experiences, beliefs, and motivations. We relied on remote video techniques (King et al., 2018), due to physical distances and COVID-19-related restrictions. In-person interviews may be the most desirable format, but growing support affirms the appropriateness of remote online interviewing for research (Johnson et al., 2019; Lo Iacono et al., 2016).

The purposive sampling reflected our searches of social media pages maintained by the case firms, so that we could identify actual consumers who commented or evaluated the service. In soliciting their participation through online contacts, we sought to balance diversity, to ensure we obtained a holistic view of customers' responses to ABS, and shared characteristics, to facilitate comparisons of the results. All the participants are Belgian or French female customers of one of the ABS providers; they differ in their age, family status, service adoption state, and opinion of the case firm.

The sampling process ceased when we reached theoretical saturation, such that the information gathered became redundant, and no new substantive information arose (Patton, 2014), which occurred after 31 interviews (Table 2). The participants are all women, which aligns with

previous research into fashion consumers' disposal habits (Morgan and Birtwistle, 2009) and evidence that women purchase clothing more frequently and are generally more involved in fashion than men are (O'Cass, 2004). The semi-structured interviews include 19 ABS customers of Le Closet and 12 customers of Coucou; their ages range from early 20 s to mid-50 s. On average, the Le Closet informants received three deliveries per month (ranging from one to four); each delivery featured a box with two pieces of clothes and one accessory (Box A) or three pieces of clothes and two accessories (Box B). Seven informants had been using the service for at least two years, three informants recently stopped their subscription, and one suspended it. The Coucou informants rent five dresses on average per year (ranging from one to fifteen), and seven have been using the service for at least two years.

The interview questions focus on the informants' experience with the case firms, their buying habits, and their behavior. The first part began with general questions (e.g., "If I say 'go shopping', what do you spontaneously think of?"), designed to prompt a first-person narrative and lay the foundations for a confident, informative interview by putting the respondent at ease. In the second part, informants relayed their perceptions of ABS, in response to grand tour and experience-based questions (Spradley, 1979), along with context details and examples, which helped us avoid misinterpretations (Hirschman, 1986). In the third part, participants reflected on their purchases of clothes and whether access to clothes encouraged them to access other product categories (e.g., décor, household appliances, gardening tools, cars). They progressively moved toward the real subject of the discussion, namely, how access-based consumption interacts with purchases and influences their consumption behavior and the meaning of consumption. Finally, the fourth part involves a general summary of the ideas evoked by the informants. To avoid social desirability biases, the interviewer never mentioned "sustainability" in advance of any spontaneous mentions of the motivations for subscribing to ABS. If they did not mention it, the interviewer introduced sustainability topics (though not before the end of the second part), by asking informants to respond to the following comment on Le Closet's Facebook opinion page: "Great concept: responsible consumption and a regularly renewed wardrobe."

3.2. Analysis and interpretation

The interviews lasted 33 to 80 min, with an average of 50 min. All interviews were audio-recorded with respondents' permission and analyzed using Nvivo (version 11). The transcription resulted in 560 single-spaced pages of text. We coded the interviews using a predefined code list that was expanded during the analysis to capture emerging

Table 2
Study 1 – Informants.

Informant	Cases	Year(s) since first access	Number of dress(es) accessed	Case status	Age	Country	Interview time (minutes)
Adeline	Coucou	> 4	6 per year	Open to repeat	28	Belgium	39.2
Angélique	Le Closet	< 1	Box A/month	Final stop	43	France	60.06
Camille	Coucou	2 to 3	3 per year	Open to repeat	30	Belgium	33.48
Caroline	Coucou	2 to 3	15 per year	Open to repeat	29	Belgium	39.11
Catherine	Coucou	1 to 2	1 per year	Suspension	29	Belgium	39.11
Célinha	Le Closet	2 to 3	Box B/4 times a month	Ongoing	28	France	49.59
Charline	Coucou	1 to 2	1 per year	Open to repeat	26	Belgium	50.04
Charlotte	Coucou	> 4	10 per year	Open to repeat	29	Belgium	48
Christine	Coucou	1 to 2	2 per year	Open to repeat	50	Belgium	44.33
Emilie	Le Closet	< 1	Box B/month	Final stop	29	Belgium	41.53
Eva	Coucou	< 1	2 per year	Open to repeat	34	Belgium	48.01
Fabienne	Le Closet	> 4	Box A/4 times a month	Ongoing	44	France	80.29
Fanny	Le Closet	< 1	Box B/3 times a month	Ongoing	25	France	56
Florence	Le Closet	1 to 2	Box B /2.5 times a month	Final stop	38	France	66
Hélène	Le Closet	2 to 3	Box A/month	Ongoing	35	France	71.53
Ingrid	Le Closet	2 to 3	Box A/2.5 times a month	Ongoing	47	France	51.36
Isabelle B.	Le Closet	< 1	Box A/4 times a month	Ongoing	45	France	51.53
Isabelle C.	Le Closet	3 to 4	Box B/3 times a month	Ongoing	49	Belgium	46.38
Jenny	Le Closet	< 1	Box A/4 times a month	Ongoing	37	France	45;43
Johanne	Coucou	1 to 2	2 per year	Open to repeat	27	Belgium	40
Julie D.	Le Closet	1 to 2	Box A/2 times a month	Ongoing	35	Belgium	38.54
Julie M.	Coucou	< 1	1 per year	Final stop	28	Belgium	41.36
Louise	Coucou	> 4	10 per year	Open to repeat	29	Belgium	51.02
Marie	Le Closet	< 1	Box B/3 times a month	Ongoing	38	France	64
Marie-Jeanne	Coucou	1 to 2	3 per year	Open to repeat	29	Belgium	44.56
Marina	Le Closet	< 1	Box B/4 times a month	Ongoing	29	France	38.48
Séverine	Le Closet	< 1	Box A/4 times a month	Ongoing	41	France	53.25
Sonia	Le Closet	1 to 2	Box A/3 times a month	Ongoing	48	France	60.04
Sophie D.	Le Closet	2 to 3	Box A/3 times a month	Final stop	48	France	49.26
Sophie E.	Le Closet	< 1	Box B/1.5 times a month	Suspension	30	Belgium	49.26
Typhaine	Le Closet	2 to 3	Box B/3.5 times a month	Ongoing	37	France	44.39

Notes: Box A = 2 pieces and 1 accessory; Box B = 3 pieces and 2 accessories; 1 month = 4 weeks.

themes.

We analyzed the recorded and transcribed interview data according to within- and cross-case analyses (Eisenhardt, 1989). This process enabled the unique patterns of each case to emerge before we began searching for cross-case similarities or differences, which we then restructured through interpretation at a higher abstraction level (Yin, 2009). We compared our findings with prior literature to situate the results according to preexisting knowledge, deepen insights, and establish the limits of their generalizability (Baxter and Jack, 2008).

To ensure the trustworthiness of our data, we applied specific techniques during the data collection, interpretation, and presentation stages (Hirschman, 1986). First, we constantly checked for the consistency of the information we obtained from interviews, observations, and documents (Patton, 2014). Second, we discussed the coding plan and jointly categorized the findings, to achieve internal consistency and agreement through discussion. Throughout these analyses, we carefully checked the transferability of the identified concepts to different ABS and customer profiles. Third, for confirmability, two independent judges used our coding grid to code five randomly selected interviews (16.12 % of the sample, more than the 10 % recommended to confirm representativeness; Lombard et al., 2002). The interjudge reliability scores, calculated using the proportional reduction in loss measure (0.88), exceeded the threshold recommended by Rust and Cooil (1994). Fourth, we discussed the findings with the founder of another Belgian clothing ABS, who confirmed their alignment with her experience. No additional insights emerged from this discussion. Thus, we have strong confidence in our findings.

3.3. Findings

Our informants' behavioral patterns in response to ABS exhibit both direct rebound and indirect rebound effects, which are positive or negative. In addition, an important characteristic of rebounds came to light through the interviews: the beneficiary of the purchase, as we

describe next, together with psychological factors we uncovered.

3.3.1. Direct rebound effects

Our informants tend to believe that ABS leads to generally positive environmental impacts (Jain et al., 2022), by reducing their purchases. They tend to link their use of the clothes service with diminished purchase impulsivity, citing reduced “compulsion,” “impulse,” and “frustration” when purchasing new clothes, which indicates a positive direct rebound effect.

Accessing clothes also provides four key stimulants (Mehrabian and Russell, 1973). First, as Fabienne or Célinha explain, some participants enjoy novelty and change, and prevent boredom, by receiving clothes on a regular basis, which reduces their needs to shop:

So, the fact that every week I have a new box arriving from Le Closet, with 2 or 3 new features ... I'm never dressed the same. Thus, I don't have to buy stuff anymore so I wouldn't always be the same. (Fabienne)

[Shopping is] something I don't do anymore and don't want to do. I find exactly what I want on Le Closet. There are new trends, there are cool things, things that I like ... every month there are new products. (Célinha)

Second, access to an unusual stimulus arises from the possibility of wearing pieces that the informants would not have purchased otherwise: “for example, this week, with Le Closet, I took purple pants. I would never have bought purple pants” (Fanny). Third, subscription to ABS incorporates an element of thrill (Gupta et al., 2020; Zuckerman, 1979) that some informants feel when receiving their rented clothes: “Every week, every time ... it's like getting a little gift. I always look forward to opening it. I directly try on all the clothes” (Marina). Fourth, ABS provide diversity: “I'm much happier than before that I have plenty of clothes available.... There is such variety, in everything they offer, so much diversity, an infinite dressing room!” (Séverine).

Informants' stimulation levels in response to these four drivers in

turn can guide their behavior and purchase impulsivity. The access to clothes appears to help them reach a desired stimulation level: not too much, not too little, as Angélique illustrates:

Another [piece of clothing], it would have been too much..... So two pieces per month were more than enough. (Angélique)

Once they strike their preferred level between boredom and arousal, some informants express diminished need to explore their environment further (Reynolds, 1962), which can be related to the concept of optimal stimulation level (OSL) (Raju, 1980; Sharma et al., 2014). If people's OSL falls below or is equal to their actual level of stimulation, they do not seek stimuli with higher arousal potential but work to become more familiar with the actual, existing stimuli (Berlyne, 1960). With regard to ABS and positive direct rebound effects, informants who achieve their OSL might be less impulsive in their purchases of new clothes, because they might think: "Oh that's nice! But I can have it on Le Closet too, so I'm not going to buy it" (Florence). However, when consumers' OSL is higher than their actual stimulation level, they likely attempt to increase their stimulation through exploratory behaviors (Baumgartner and Steenkamp, 1996; Joachimsthaler and Lastovicka, 1984), such as by trying new products, switching brands for change or novelty, and exploring by shopping (Kwon and Workman, 1996; Raju, 1980). This exploration eagerness is well illustrated by Marina's, Fanny's, and Séverine's previous quotes. If people strongly appreciate the variety, novel, and trendiness provided by ABS, they also might exhibit unsustainable behaviors (negative rebound effects) if their OSL is relatively high. These psychological variables, summarized in Fig. 1 as "Need for novelty and change," thus seem relevant to consider further.

In addition, consumers' perceptions of how well a product or service can satisfy a specific need can change through learning processes (Witt, 2001). Whether consumers access or purchase rented clothes might depend on their profiles and goals, which shift over time. In particular, we find that informants who adopt the service for environmental reasons (Barbopoulos and Johansson, 2016) seem to display less purchase impulsivity. They consider purchases inappropriate, even if tempting, because it would render the ABS pointless from an environmental perspective. As Fabienne explains: "Although I can't achieve this level of minimalism [editor's note: she owns only 3 t-shirts, 2 panties, and 4

socks], I still need to ask myself how to reduce my footprint after all." If they purchase, these informants say they often regret it, because they become bored with or do not wear the pieces. Therefore, for some informants, purchasing rented pieces implies an impulse purchase rather than a thoughtful act.

Other informants (e.g., illustrated in Fanny's, Célinha's, or Marina's previous quotes) mainly seek hedonic benefits from adopting the service, so they value subjective and emotional outcomes, such as emotional gratification and sensory pleasure (Hirschman and Holbrook, 1982). They display a less radical, more progressive reduction in their impulse purchases, and negative direct rebound effects seem more likely, such that their reduced purchase impulsivity toward new clothes can translate into purchases of rented clothes; they find resisting such purchases "hard," "violent," and "frustrating." Therefore, they indulge, at least initially, though "I think the path continues as it goes.... Sometimes I realize that when I buy my Closets [rented clothes] ... afterwards I tell myself that I shouldn't have necessarily bought them! It's gradual" (Julie D.). These informants may take more time to get to the point that they reduce their purchases of rented clothes, considering the links between hedonic shopping motivations and impulsivity (Ramanathan and Menon, 2006).

We also find informants who consider upgrading their subscription to receive more clothes: "I tell myself that the few things I buy now (tops and dresses, for example), I think I could not buy them at all [by accessing more clothes instead]" (Hélène). Still others maintain multiple subscriptions simultaneously, "to have one and to be able to send another at the same time" (Fanny). This need for "more" could imply the informants' hedonic motivations, like Fanny's, and higher OSL (Baltas et al., 2017; Joachimsthaler and Lastovicka, 1984). People with high OSL exhibit stronger exploratory (Raju, 1980), variety-seeking, curiosity, and risk-taking tendencies, rather than utilitarian or purposeful behavior (Fiore et al., 2001). The stimulation provided by access, which people inevitably experience differently (Zuckerman, 1971), might not reach the individual OSL of informants who adopt ABS for hedonic reasons, unless they keep renting more and more.

Finally, some informants who exhibit utilitarian motivations when shopping for clothes are subject to negative direct rebound effects when adopting ABS, if the stimulation provided by access leads them to

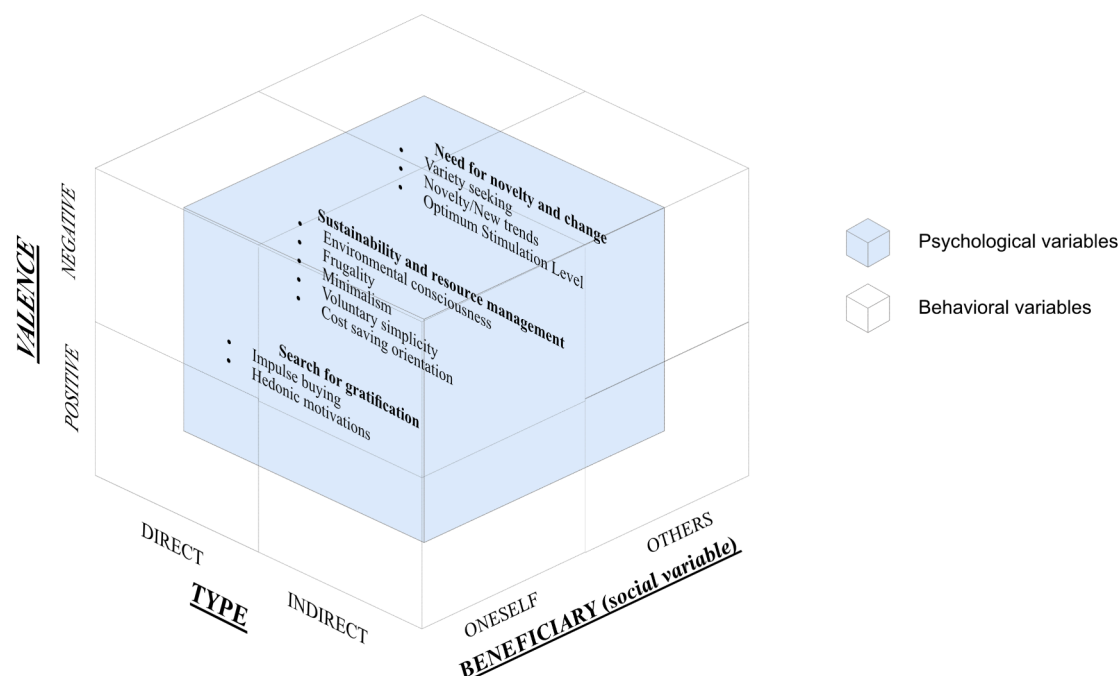


Fig. 1. Study 1 – Socio-psychological factors underlying rebound effects in clothing ABS.

discover the hedonic appeal of shopping: “I bought myself a yellow jacket this winter, which I certainly would not have bought myself the year before. I realized that having fun was also good, quite simply ... with something that will be out of fashion next year or even this winter” (Sophie D.). After experiencing fun, thanks to her subscription to Le Closet, Sophie D. began buying more ephemeral clothing, and stopped her subscription, whereas she previously only bought a few timeless items. Furthermore, access might reinforce consumerist values, by increasing the need for change: “If I changed the color of my kitchen ... I wouldn’t buy a new coffee maker if it is not the right color. However, if ... you rent it, you don’t care! Afterward, it is a mode of consumption which is extremely ... futile in itself ... it responds to a wish more than a need” (Hélène).

These findings thus reveal the importance of considering consumers’ environmental or hedonic goals, which may influence their purchase impulsivity. Impulsivity in turn can lead to unsustainable behaviors (negative rebound effects). Such psychological factors can be summarized in two categories, “Search for gratification” and “Sustainability and/or resource management,” as shown in Fig. 1 and are worth considering further, as we do in Study 2.

3.3.2. Indirect rebound effects

In our interviews, we also observe two indirect changes in certain users’ behaviors and consumption patterns when they adopt ABS: an increase in consumption (negative indirect rebound effects) connected to a saving effect (Greening et al., 2000) or a qualitative change in consumption (positive indirect rebound effects) that implies a responding effect (Zink and Geyer, 2017). Cost savings can be important drivers of ABS (Möhlmann, 2015), and some informants cite better control over and reductions of their budgets, achieved through their use of ABS, indicating greater price and value consciousness (Lichtenstein et al., 1990), such that “before Le Closet I was spending about 200 € per month for clothes.... Right now—I did the math over a year—even with the purchase that I buy from Le Closet, I am at 80 € a month” (Célinha). Hélène instead uses savings on clothes for herself to spend in other categories and for others: “I realize that I transfer this budget to my children: I buy more for the girls than they would need. And, I also by more shoes and sometimes, I allow myself to buy myself something else.” This description signals a strong hedonic consumption motive, as well as insatiable wants and needs overall (Wördsdorfer, 2010) that drive additional consumption behaviors. Hélène’s quote also indicates a novel, important social aspect: the beneficiary of the purchase. Buying for others reflects criteria different than those applied to purchase decisions for the self (Lu and Shang, 2021), including greater variety seeking (Choi et al., 2006), indulgence (Laran, 2010), and preferences for desirability over feasibility (Lu et al., 2013), idealistic over pragmatic considerations (Danziger et al., 2012), and hedonic over utilitarian consumption (Lu et al., 2016). The environmental benefits due to decreased demand or production in one category then get (partially) offset by increased demand and production for other products or services, ultimately resulting in a negative rebound effect.

But other informants, such as Sophie E. and Célinha, use the cost savings gained from the clothes ABS to create a “qualitative budget envelope” that they devote to more responsible purchase choices, beyond the ABS, such that it becomes “possible to reserve shopping expenses for more timeless or better-quality pieces, produced in the best conditions perhaps, and which will have a longer life” (Sophie E.). This budget can encompass products in other categories too, such that Célinha tries to make more “thoughtful purchases” of a new mattress. Instead of rebuying the same mattress from IKEA, which she would change every 5 years, she sought a better quality, more expensive mattress option that would last 15 years and cost less in the long run. These altered, individual behavioral patterns imply utilitarian goals and reflect disciplined, careful resources management, which even might be characterized as frugality, defined as a “general preference to (a) conserve resources and (b) apply an economic rationale in the

acquisition of resources” (Michaelis et al., 2020, p. 1). Consumers who adopt such patterns of thoughts, feelings, and intentions appear to prefer to conserve resources and obtain more from less, regardless of situational conditions (Goldsmith et al., 2014) and in the service of longer-term goals (Suarez et al., 2020). Frugality also can translate into minimalism, voluntary simplicity, or deprivation (Bove et al., 2009; Lastovicka et al., 1999; Suarez et al., 2020; Wilson and Bellezza, 2022). Careful resource management and frugal behaviors likely induce positive rebound effects (or no rebound effects at worst), because the purchases decrease the environmental burden of ownership. These informants note their desire to change their consumption pattern to be more responsible; they tend to adopt ABS for environmental reasons. A tendency to choose quality over quantity also depends on the extent to which people value minimalism (Wilson and Bellezza, 2022), as cited by Fabienne in her previous quote.

Finally, some informants do not adjust their demand for other goods, so even though “I earned 100 € per month ... I do not spend it on other things” (Typhaine). In contrast with Célinha, Typhaine does not spend the money she saved through ABS on other things; no negative rebound is thus expected. Typhaine’s need for variety is specific to clothing, such that she seeks variety in this one product category, not in others (Wahlers and Etzel, 1985). Our informants who occasionally use the ABS (rather than purchasing memberships) also tend to persist in the same behavior. They seek different outfits for certain occasions, so “It’s important to change for the events we’re going to take pictures and be immortalized. But obviously, in everyday life, when I go to work, the same clothes turn. And, I don’t have a problem with putting on the same clothes” (Marie-Jeanne). These consumers do not transfer their clothing budgets to other categories, because their need for newness and diversity is specific to special occasions. They thus exhibit contrasting influences related to impulse buying and variety-seeking (Sharma et al., 2010): They seek more variety in public to present themselves as interesting but also work to control their impulses (Luo, 2005; Ratner and Kahn, 2002).

These findings highlight the relevance of informants’ resource management tactics (cost savings orientation, degree of frugality, minimalism, simplicity) for understanding the occurrence of rebound effects. Cost savings can favor negative rebounds, depending on the tactics informants use to spend (or not) their new resources. Fig. 1 summarizes these psychological variables in the category “Sustainability and/or resource management.”

3.4. Discussion

The interview findings reveal the need to consider social aspects, such as the beneficiary of increased (decreased) demand, in cases of negative (positive) rebound and its direct or indirect forms. They also indicate the potential role of psychological factors related to the needs for novelty and change (i.e., search for novelty and new trends, variety seeking, and OSL), the search for gratification (i.e., impulsivity and hedonic goals), and sustainability and/or resource management efforts (i.e., environmental consciousness, cost saving orientation, minimalism, simplicity, and frugality), which can evoke varying degrees of positive and negative rebound effects (Fig. 1). These four categories of psychological factors relate to the functional (e.g., choice diversity), social (e.g., trends affinity), hedonic (e.g., enjoyment), environmental (e.g., reduced environmental impact), and economic (e.g., cost savings) drivers previously identified in research to encourage the use of ABS. When consumers engage in sharing practices motivated by these drivers, they may display negative rebound behaviors. It is thus important to better understand how these factors translate into rebound behaviors across groups of consumers, as we consider further in Study 2.

4. Study 2

Using the qualitative results we gathered in Study 1, we conducted a

quantitative segmentation study with a larger sample. Our purpose is to identify the relative prevalence of direct and indirect, positive and negative rebound effects and the role of the purchase beneficiary (self or others), and heterogeneity in the occurrence of rebound effects across different segments of ABS consumers. Specifically, we aim to identify which psychological factors, among those identified in Study 1 (Fig. 1), underly segments that are characterized by negative rebound.

4.1. Sample

We recruited a sample with the help of the Qualtrics Panel in France, a private research firm that partners with PureSpectrum, a web-based panel provider of diverse, high-quality respondents. The median age category of the panel from which we sampled the respondents for this study is 45–54 years, and 51.53 % are women. It is fairly representative of the French population in terms of age and gender (www.insee.fr/fr/statistiques/2381474). The survey, in French, could be answered on computers or tablets. To qualify to participate, respondents had to indicate that they rent clothing at least occasionally, whether as part of a subscription or not, encompassing all types of clothing (e.g., everyday wear, evening attire, ceremonial outfits, costumes). We also included an attention check and excluded any respondents who answered it incorrectly. The average time needed to read (without answering) the questionnaire (with 4001 words) is around 9 min, according to both our pretest and an average reading rate of 450 words per minute (Greszki et al., 2015). Therefore, we removed any respondents who took less than 9 min to read and complete the survey. Additional quality checks pertained to inattentive response times (too long for one sitting) and

straightlining (common in surveys with multiple matrix questions). Ultimately, 499 respondents represent the final sample (Table 3), for which the mean age is 40.36 years, 40.7 % are men, 68.5 % continued their education after college, and 43.9 % had subscribed to a clothing rental service, and they devoted an average of 26.6 % of their annual clothing budget to renting (versus buying) clothes.

4.2. Measures

To establish different segments of renters on the basis of their rebound behaviors, we used four items pertaining to rebound effects in the same or different product categories, purchased for the respondent or other people in the household. That is, we asked “How are your clothing rentals, as described in the scenario, likely to influence ... clothing purchases for yourself [direct rebound, self]/clothing purchases for other members of your household [direct rebound, others]/purchases for yourself in other product or service categories [indirect rebound, self]/purchases for other members of your household, in other product or service categories [indirect rebound, others]?” Each item used 3-point ordinal scales, ranging from “My rentals will probably reduce the budget allocated to these purchases” (−1) to “My rentals will probably increase the budget allocated to these purchases” (+1), with a middle point at “My rentals will probably not affect the budget allocated to these purchases” (0). Respondents had to answer these questions after reading a scenario (translated from French) about a fictive brand, Zenia:

As part of this study, please imagine yourself in the situation described below and answer the questions as if you were actually in the described situation. When you want to wear new clothes, you have the option to either buy clothes that you like (in-store or online) or rent them for a certain period. Zenia is a ready-to-wear website for men and women that offers a wide range of rental clothes from various brands. Imagine that you are quite familiar with this website. You really like the rental clothes they offer, because there is a great variety of styles and colors. You have decided to rent clothes on the Zenia website. For a monthly fee of €39, you can rent 2 pieces of clothes at a time from the catalog they provide, and you can keep them for as long as you want (including deliveries and free returns). These pieces of clothes will be delivered to your home within 2–3 days. As soon as you no longer wish to wear them, you send them back, and you can select 2 new pieces. It's a subscription without any commitment, and you can cancel it at any time. This week, you have rented a shirt and a pair of trousers. These items fit you very well.

We then asked participants if they would subscribe to Zenia and if the behaviors portrayed in the scenario resemble their own. Considering that 80.4 % of respondents answered they would perhaps or definitely subscribe to Zenia and 79 % regarded the person's behavior as similar to theirs, the scenario appears quite realistic for the respondents.

To check the quality of our measures for direct versus indirect rebound effects, we included an item about the likelihood they would continue buying clothes despite renting (“Since I rent clothes on Zenia, the probability of me buying clothes again in the future is ... 1 = low, 7 = high”). As expected, the score for this item correlated significantly with the direct but not with the indirect rebound measures (Spearman's Rho correlations: direct rebound measure for self = 0.229, $p = 0.001$, for others = 0.106, $p = 0.018$; indirect rebound measure for self = 0.037, $p = 0.405$, for others = 0.021, $p = 0.647$).

To establish different segments of renters and profile them according to the variables of interest derived from Study 1 (Fig. 1), we administered 5-point Likert scale questionnaires, both before and after the scenario. Appendix 1 lists all the measurement scales, their sources, and the Cronbach's alpha values. Before providing the scenario, we measured hedonic motivations (adventure and gratification), cost saving orientation (value), and desires for novelty and trends (ideas), using an adapted version of the shopping motivations scale; furthermore, we gauged impulse buying tendency and variety-seeking

Table 3
Study 2 – Sample socio-demographic information (N = 499).

	Demographics	%
Gender	Male	40.8
	Female	58.2
Age	18–25	16.7
	26–35	27.5
	36–45	23.3
	46–55	14.5
	56–65	13.7
	66 or above	4.4
Occupation	Farmer	0.4
	Craftsperson, trader, entrepreneur	5.2
	Senior managers and senior intellectual professions	23.4
	Intermediary occupations	17.6
	Employee	32.3
	Worker	3.4
	Retired	9.4
	Unemployed	5.8
	Other	2.4
	No college degree	8.6
Education	College degree (“Baccalauréat”)	22.9
	Higher education	68.5
People in the household	1	12.6
	2	27.3
	3	23.0
	4 and more	37.1
Social class	Disadvantaged	1.4
	Working class	9.6
	Lower middle class	41.5
	Upper middle class	41.3
	Wealthy	5.0
	Privileged	1.2
Living environment	Urban setting, Paris and suburbs	19.0
	Urban setting, another major metropolitan area	32.7
	Urban setting, small town	30.7
	Rural setting	17.6
Clothing rental subscription	Yes	43.9
	No	56.1

tendency. We asked respondents to indicate the total budget they spend on clothes per year, if they subscribed to a clothes renting service, how frequently they rent clothes and which types, their attitudes toward renting, and the percentage of their annual clothes budget devoted to renting (versus buying) clothes. Following the scenario, we measured frugality, OSL, minimalism, the environmental dimension of consciousness of sustainable consumption (i.e., environmental consciousness), and voluntary simplicity. Finally, we gathered socio-demographic information about respondents' age, gender, education, occupation, household size, living situation, and social class.

4.3. Analyses and results

Using hierarchical clustering on principal components, we leverage complementarities between the clustering and principal component methods to identify the main features of the data set. In turn, we can perform hierarchical clustering and partitioning on the principal components obtained with multiple correspondence analysis (MCA) or other factorial methods, choose the number of clusters, visualize the tree, and partition the principal components in a convenient way. The clustering analyses use the R Statistical Software (v4.3.0; R Core Team, 2023), implemented with the FactoMineR package (v2.8); the visualizations came from the factoextra (v1.0.7) package. The cluster number criteria were computed with cluster (v2.1.4) and NbClust (v3.0.1) packages.

4.3.1. Stage 1: Identifying segments of renters

Pre-clustering process. The four rebound measures we collect are categorical (−1, 0, 1), so we use MCA as a pre-processing step (Greenacre, 2006). Their coordinates on the main components inform the first-stage hierarchical clustering, as is common practice, especially for questionnaires, because it stabilizes the clustering by removing noise from the data and transforming the categorical variables into continuous

variables (Husson et al., 2010).

The three levels of the categorical variables can be represented on a factorial map of the two first principal components, which explain 56.5 % of the variance (see Fig. 2). Dimension 1 distinguishes negative rebound (all +1 values group around 2 on Dimension 1) from positive or no rebound (all 0 and −1 values group around 0). That is, this dimension mostly specifies negative rebound. Dimension 2 distinguishes positive rebound (all −1 values group around −1 on Dimension 2) from no rebound or negative rebound (all 0 and +1 values group around 0.5). Thus, Dimension 2 specifies positive rebound.

Clustering. We rely on the hierarchical clustering on principal components function from the FactoMineR package (Lê et al., 2008) to identify segments of renters who exhibit different rebound effects. To benefit from hierarchical and nonhierarchical clustering methods and increase the validity of the solution, we used both methods sequentially: hierarchical clustering with the Ward method, followed by the K-means clustering (nonhierarchical) (Hair et al., 2018).

Using the dendrogram in Fig. 3, we compared different solutions, ranging from three to seven clusters, and determined the most appropriate number of clusters according to several criteria. First, with elbow method plotting, we clustered quality metrics (e.g., total within sum of squares; gap statistics) as a function of the number of clusters. The elbow point in Fig. 4 is a good indication of the optimal number of clusters (both graphs indicate 5 clusters). Second, the average silhouette width coefficient (ranging from −1 to 1, where higher values indicate better defined clusters; Fig. 3) increased, from 0.54, 0.58, 0.65, 0.68, to 0.70 for three to seven clusters, respectively. Third, the largest to smallest cluster size ratios are 1.69, 6.51, 4.75, 4.75, and 6.04 for the three- to seven- cluster solutions, respectively (i.e., four clusters performs worst; five or six clusters appear more balanced). One cluster is relatively smaller than the others ($N = 33$) but also arises in the three-cluster solution and then remains stable thereafter. It is clearly characterized by

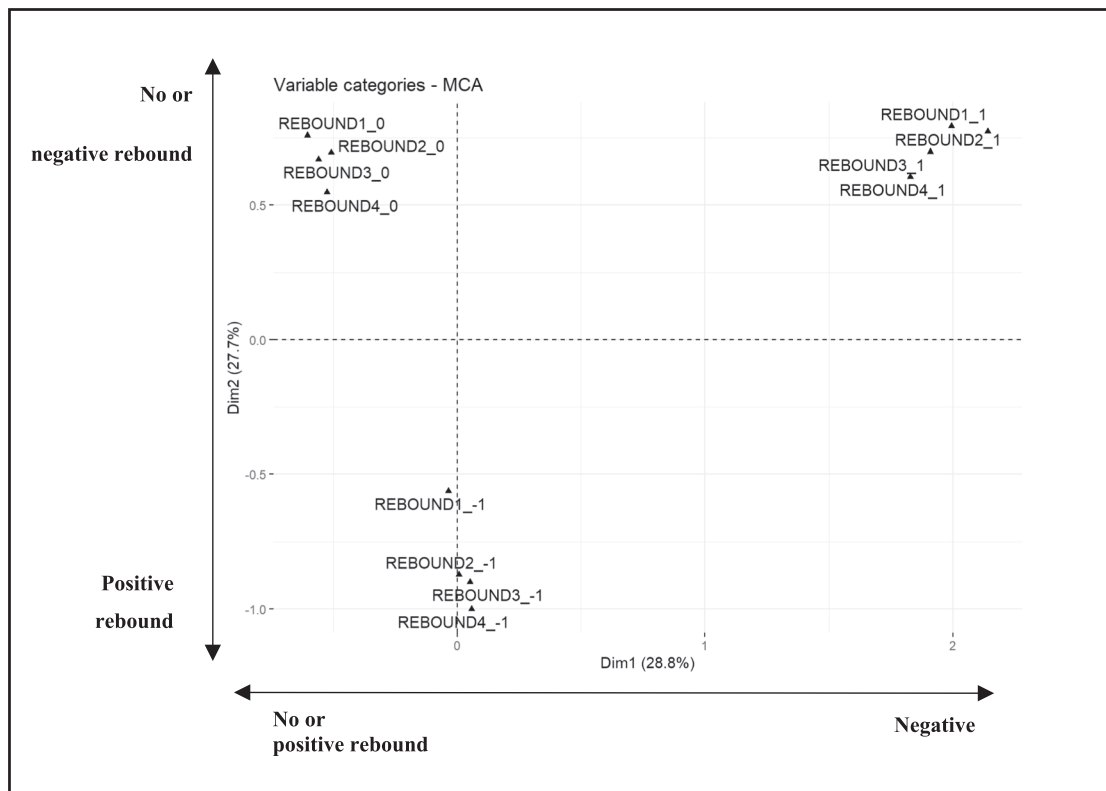


Fig. 2. Study 2 – Map of four rebound measures on the two first MCA dimensions Notes: REBOUND 1 refers to purchase of clothes for oneself; REBOUND 2 refers to purchase of clothes for others; REBOUND 3 refers to purchase in other product/service categories for oneself; REBOUND 4 refers to purchase in other product/service categories for others; REBOUNDX_0 refers to no change in purchase; REBOUNDX_1 refers to increasing purchases; REBOUNDX_-1 refers to reducing purchases.

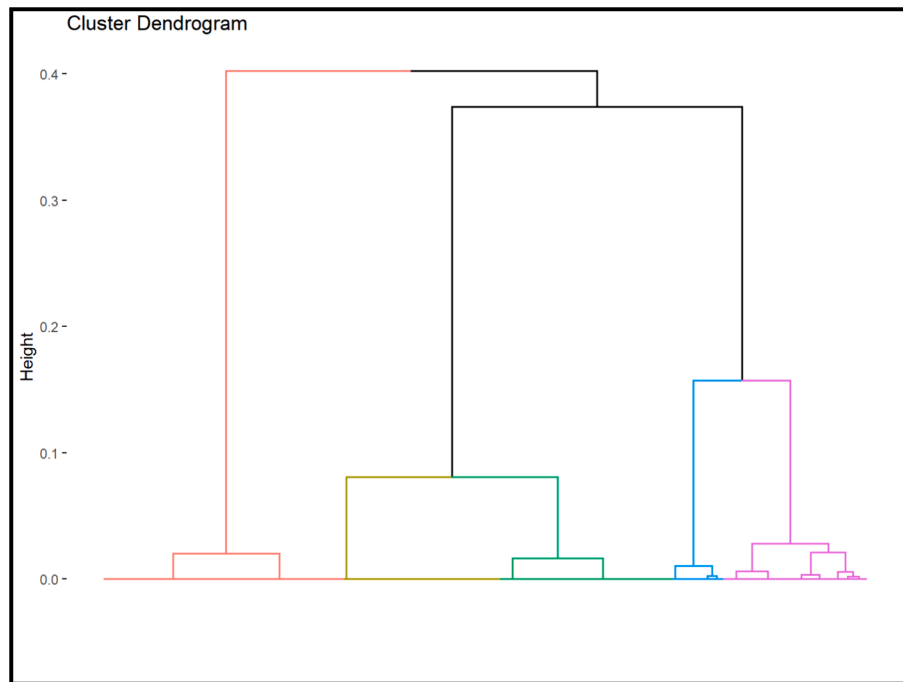


Fig. 3. Study 2 – Dendrogram of the hierarchical clustering Notes: Clustering solutions from 14 and 499 clusters are not represented.

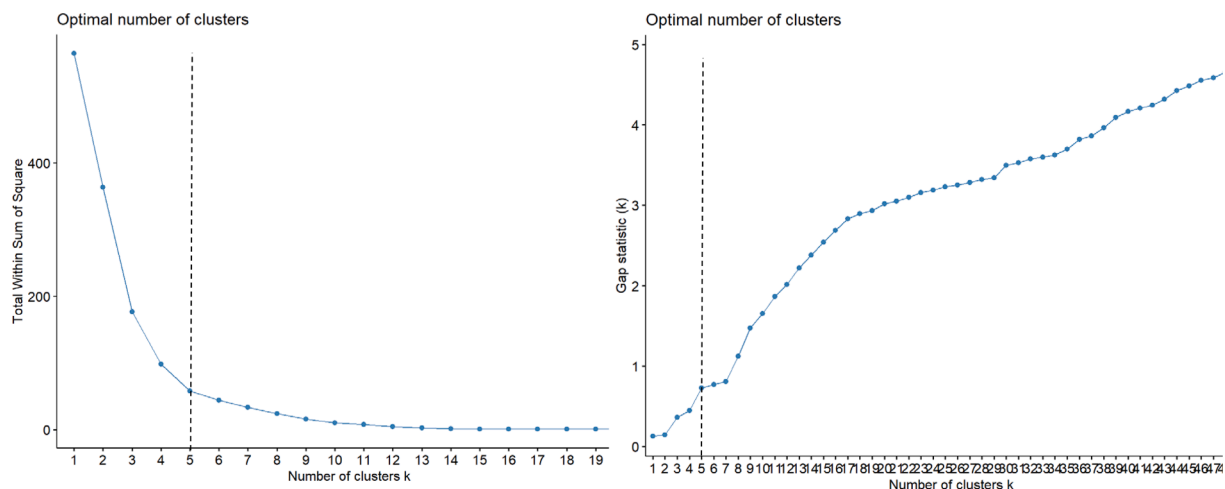


Fig. 4. Study 2 – Plot identification of the optimal number of clusters (hierarchical clustering).

negative rebound and thus is highly relevant for our study. Fourth, compared with the four-cluster solution, the five-cluster solution splits the very dense second cluster (215 renters) into two distinct clusters (with 113 and 102 renters). Fifth, for greater managerial interpretability (Hair et al., 1998), we regard five clusters as easily interpretable and meaningful. The six- and seven-cluster solutions split cluster 4, leading to rather small groupings ($N = 22$ to $N = 46$). Therefore, the five-cluster solution seems the most balanced.

Because we found no outliers in the first step, we clustered the sample using K-means clustering (nonhierarchical); the centers attained from the hierarchical clustering results represent initial seed points (Hair et al., 2018). With this step, we can fine-tune the results. The profile results from the K-means clustering remain very similar; only 2 % of the sample was clustered differently, and they all moved from Cluster 4 ($N = 84$) to Cluster 1 ($N = 167$) in the K-means clustering. Fig. 5, the cluster plot according to the MCA factorial design, illustrates that Clusters 1, 3, and 5 exhibit high within-cluster homogeneity, whereas

Clusters 2 and 4 are more heterogeneous.

Cluster Profiles. Fig. 6 reveals the within-cluster differences and differences in profiles across the five clusters, in terms of the type of rebound effects. Cluster 1 groups renters who tend not to adjust their buying behavior (for themselves or others, in the same or other categories) after renting clothes. A small proportion of this segment displays positive rebound, for clothes shopping and for themselves. Overall though, we label Cluster 1 as the “no rebound” group. Cluster 2 mostly contains renters who demonstrate positive rebound effects after renting, except if they buy for others and in other categories. For these purchase occasions, renters in Cluster 2 mostly do not adapt their purchase behavior (no rebound effect). We thus label Cluster 2 the “mixed positive-neutral rebound” group. Cluster 3 contains renters who clearly reduce their purchases (for themselves and others, same and other categories) after renting clothes; we refer to them as the “positive rebound” group. It provides the clearest example of consistent behavior (reduced purchases) across categories and beneficiaries. In Cluster 5, we find

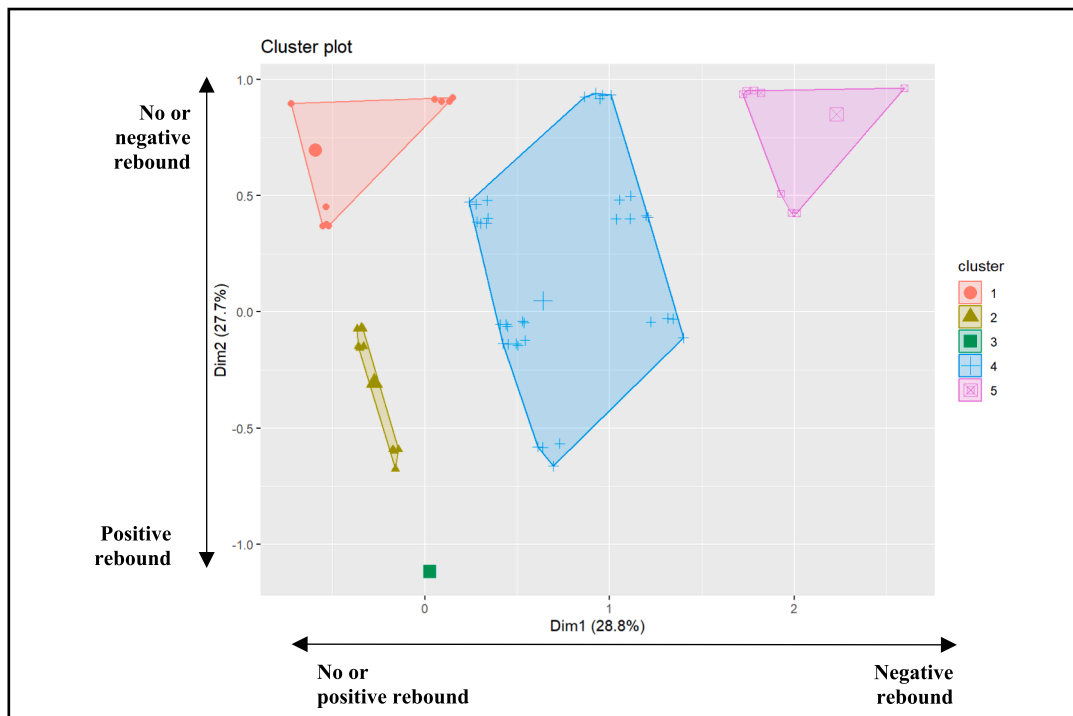


Fig. 5. Study 2 – Cluster plot on the MCA factorial design.

renters who increase their purchases (for themselves and others, in the same and other categories) after renting clothes, so they represent the “negative rebound” group. Finally, Cluster 4 includes renters with positive, negative, or no rebound; after Cluster 5, it contains the largest number of renters exhibiting negative rebound effects, especially in other product and service categories, and even more so if they buy for others. We call this cluster the “negative indirect rebound” group. In addition, the positive rebound for Cluster 4 primarily relates to purchases in the focal product category (direct rebound), which might be driven by some forms of moral licensing. Together, Clusters 4 and 5, as manifestations of the dark side of ABS, represent 23 % of respondents. These results confirm the importance of the social dimension for understanding and predicting rebounds. If negative rebounds occur, they are more likely to appear in other categories and for others in Cluster 4, whereas positive rebounds, if they appear, are less likely to involve other categories or others in Clusters 1 and 2.

The socio-demographic profile of each cluster in Table 4 reveals significant differences in terms of age, gender, household composition, education, and residence. Renters in Cluster 4 are younger than those in any other clusters (the difference with Cluster 5 is only marginally significant, $p = 0.07$), and they live alone more than renters from Cluster 2. Those in Cluster 1 live alone more than those in Cluster 2 too. Women are more heavily represented in Cluster 3 than in Clusters 4 and 5. People living in rural areas also are more represented in Cluster 3 than in Clusters 1 and 4. We observe a larger number of highly educated renters in Cluster 4 compared with Cluster 3. The renters who display some negative rebounds (Clusters 4 and 5) tend to be men; the distinction between them is that renters who display indirect negative rebound (Cluster 4) are younger. They also tend to be more educated and live alone, though these differences are not as stark. We confirm that there are no significant differences in perceptions of the realism of the scenario across clusters for either measure ($\chi^2(8) = 13.030$, $p = 0.111$ and $\chi^2(4) = 4.122$, $p = 0.390$).

4.3.2. Stage 2: Differences across clusters

To identify if specific psychological patterns underlie the different segments, we also consider our 10 psychological constructs for profiling

the five clusters.

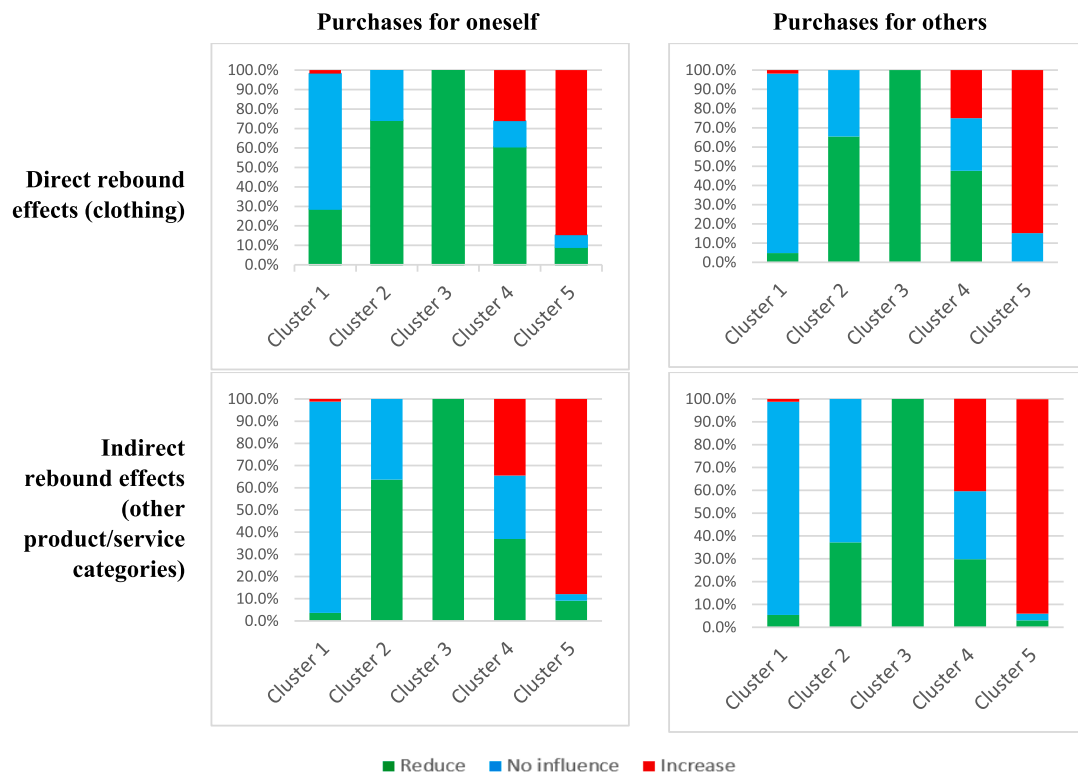
Scores for the Multi-Item Independent Variables. We test for the unidimensionality (using factor analyses) and reliability of all multi-item variables and aggregate the respective items (see Appendix 1). Table 5 contains the Spearman correlations of the psychological variables we use to analyze differences across clusters.

Profiling Clusters. The large differences in the sizes of the clusters and the non-normal distribution of some variables in our analysis prompted us to use the non-parametric statistical Kruskal-Wallis test and associated post hoc test to check for differences across clusters. Appendix 2 contains boxplots of the distribution of psychological variables for each cluster.

To understand negative rebound, we zoom in particularly on Clusters 4 and 5.¹ Table 6 reveals significant distribution differences for frugality, OSL, and hedonic shopping; none of the other constructs differ significantly across clusters. Consumers from the negative rebound Cluster 5 express higher OSL than consumers in any other clusters. They also demonstrate stronger hedonic motivations than renters in Clusters 2 and 4. Providing empirical evidence for our conjectures in Study 1, OSL and hedonic shopping motivation have important effects on the occurrence of negative rebound effects.

For Cluster 4, with mixed rebound effects and the second highest number of renters exhibiting negative rebound effects, the results tell a

¹ Study 1 highlighted that increased spending could reflect higher quality or durable purchases by consumers who choose quality over quantity. This more sustainable choice implies minimalism values (Wilson and Bellezza, 2022), so we checked if any correlations of environmental consciousness with minimalism or voluntary simplicity were significant among Clusters 4 and 5. They were not; rather, these correlations were highly significant for renters in Clusters 1 to 3 who do not display negative rebound behaviors (Spearman's Rho correlations with minimalism: Cluster 1 = 0.180, $p = 0.020$, Cluster 2 = 0.276, $p = 0.003$; Cluster 3 = 0.499, $p < 0.001$; with simplicity: Cluster 1 = 0.338, $p < 0.001$, Cluster 2 = 0.330, $p < 0.001$; Cluster 3 = 0.309, $p = 0.002$). These results imply that the increased budgets spent by renters in Clusters 4 and 5 reflect negative rebound effects, not a quality over quantity choice related to sustainability concerns.



		Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Across-cluster differences¹						
REBOUND 1: Clothing purchases for oneself	Decrease	28.7% ^a	74.3% ^b	100% ^c	60.7% ^d	9.1% ^e
	No influence	69.5% ^a	25.7% ^b	0% ^c	13.1% ^d	6.1% ^d
	Increase	1.8% ^a	0% ^a	0% ^a	26.2% ^b	84.8% ^c
REBOUND 2: Clothing purchases for others	Decrease	4.8% ^a	65.5% ^b	100% ^c	47.6% ^d	0% ^a
	No influence	93.4% ^a	34.5% ^b	0% ^c	27.4% ^{b,d}	15.2% ^d
	Increase	1.8% ^a	0% ^a	0% ^a	25.0% ^b	84.8% ^c
REBOUND 3: Other products purchases for oneself	Decrease	3.6% ^a	63.7% ^b	100% ^c	36.9% ^d	9.1% ^a
	No influence	95.2% ^a	36.3% ^b	0% ^c	28.6% ^b	3.0% ^c
	Increase	1.2% ^a	0% ^a	0% ^a	34.5% ^b	87.9% ^c
REBOUND 4: Other products purchases for others	Decrease	5.4% ^a	37.2% ^b	100% ^c	29.8% ^b	3.0% ^a
	No influence	93.4% ^a	62.8% ^b	0% ^c	29.8% ^d	3.0% ^c
	Increase	1.2% ^a	0% ^a	0% ^a	40.5% ^b	93.9% ^c
Within-cluster differences²						
Test statistic (df=3)		58.506	29.084	0	11.092	1.50
p-value		.0001	.0001	1.00	.011	.682
Pair-wise comparison	REBOUND 1-2	p = .001	n.s	n.s	n.s	n.s
	REBOUND 1-3	p = .001	n.s	n.s	p = .045	n.s
	REBOUND 1-4	p = .001	p = .0001	n.s	p = .007	n.s
	REBOUND 2-3	n.s	n.s	n.s	n.s	n.s
	REBOUND 2-4	n.s	p = .001	n.s	p = .039	n.s
	REBOUND 3-4	n.s	p = .002	n.s	n.s	n.s

¹ We use the z-tests of proportions, and numbers on one line followed by different superscript letters differ significantly at $p < .05$.

² We use a related-sample Friedman's two-way analysis of variance by ranks.

Fig. 6. Study 2 – Differences within and across clusters, direct and indirect rebound effects ¹ We use the z-tests of proportions, and numbers on one line followed by different superscript letters differ significantly at $p < 0.05$. ² We use a related-sample Friedman's two-way analysis of variance by ranks.

Table 4
Study 2 – Cluster profiles.

	Cluster 1 (N = 167)	Cluster 2 (N = 113)	Cluster 3 (N = 102)	Cluster 4 (N = 84)	Cluster 5 (N = 33)
	No rebound	Mixed positive-neutral rebound	Positive rebound	Negative indirect rebound (contextual apathetic spenders)	Negative rebound (thrill and pleasure seekers)
	Consumers do not demonstrate any significant change in purchases after renting	Consumers reduce their purchases after renting, in particular clothes for themselves	Consumers reduce their purchases after renting	Consumers increase their purchases, after renting, in other categories	Consumers increase their purchases after renting
Percentage of people living alone ¹	15 % ^{a,b}	8 % ^b	9.8 % ^{a,b}	19 % ^a	9.1 % ^{a,b}
Female gender ¹	60.8 % ^{a,b}	59.3 % ^{a,b}	67.6 % ^b	50.6 % ^a	45.5 % ^a
Living in an urban area ¹	83.8 % ^a	82.3 % ^{a,b}	73.5 % ^b	88.1 % ^a	87.9 % ^{a,b}
Lower and middle class ¹	50.9 %	54.9 %	52.9 %	50.0 %	57.6 %
With high school degree ¹	24.0 %	18.6 %	29.4 %	18.1 %	24.2 %
With more than high school degree ¹	68.3 % ^{a,b}	69.0 % ^{a,b}	62.7 % ^b	76.2 % ^a	66.7 % ^{a,b}
Has already subscribed a clothing rental service ¹	46.7 %	44.2 %	42.2 %	36.9 %	51.5 %
Age (median) ²	38.0 ^a	40.0 ^a	40.5 ^a	32.0 ^b	36.00 ^a
Annual clothing budget in euros (median) ²	2081.00	2600.00	1660.00	2191.50	3175.00
% of budget in renting (versus buying) clothing ²	24.95 %	28.54 %	26.28 %	26.60 %	29.42 %
Attitude toward renting (median) ²	4.33	4.33	4.17	4.00	4.67

¹ For the nominal variables, we use the z-tests of proportions. Numbers followed by different superscript letters differ significantly at $p < 0.05$.

² For the ordinal variables, we use the Kruskal-Wallis test, a non-parametric, one-way analysis of variance on ranks. If the results show significant differences, we conduct post hoc tests for multiple comparisons to identify the cluster pairs characterized by different distributions. Numbers followed by different superscript letters differ significantly at $p < 0.05$.

Table 5
Study 2 – Spearman correlation on psychological variables.

	1	2	3	4	5	6	7	8	9
1. Hedonic shopping	1.00								
2. Shopping for idea	0.581**	1.00							
3. Shopping for value	0.149*	0.002	1.00						
4. Impulse buying	0.620**	0.501**	0.027	1.00					
5. Variety seeking	0.527**	0.478**	0.188**	0.449**	1.00				
6. Frugality	0.035	-0.039	0.442**	-0.057	0.152**	1.00			
7. OSL	0.364**	0.388**	0.088	0.376**	0.508**	0.184**	1.00		
8. Voluntary simplicity	0.010	-0.049	0.261**	-0.133**	0.111*	0.453**	0.101*	1.00	
9. Minimalism	-0.091*	0.001	0.176**	-0.104*	0.056	0.356**	0.075	0.413**	1.00
10. Environmental consciousness	0.142**	0.263**	0.086	0.075	0.227**	0.155**	0.268**	0.299**	0.283**

** Significant at 1%.

* Significant at 5%.

different story. These renters display the lowest OSL and hedonic motivations for shopping; the differences are only significant in comparison with renters from Cluster 1 (no rebound) and Cluster 5 though. In addition, Cluster 4 indicates the lowest level of frugality, yet these differences are significant only in comparison with consumers in Clusters 1 (no rebound) and 3 (positive rebound). Frugality thus seems complementary to OSL and hedonic shopping motivations in terms of anticipating negative indirect rebound effects in Cluster 4.

4.4. Discussion

The clustering analysis sheds light on two notable segments of ABS users, which together represent nearly one-quarter of the renters in our sample, but who display different negative rebound effects. Cluster 5 contains consumers whose behaviors are characterized by the highest

levels of OSL and hedonic shopping motives. Renters in this cluster display consistent negative rebound effects, independent of the product/service category or purchase beneficiary. They are more likely to be men. Cluster 4 consumers instead increase their purchases mostly in other product categories. They are the least frugal consumers but also display the lowest OSL and are least driven by hedonic motives. These consumers tend to be young, single men, highly educated and living alone in an urban area. Such findings resonate with some prior research that offers paradoxical findings related to young adults and sustainability. For example, studying infrequent purchases of luxury products, Kapferer and Michaut-Denizeau (2020) find that Millennials (born between 1981 and 2000) are more disengaged than older generations and express detachment toward sustainability. Vanhamme et al. (2023) concur that younger luxury consumers are highly ambivalent and can exhibit conflicting facets, such as immorality, unhappiness with the self,

Table 6
Study 2 – Differences across clusters on psychological variables.

Clusters	Mean rank sample 1	Mean rank sample 2	Standard error	Sig.
Hedonic shopping (H(4) = 12.109, p = 0.017)				
1–2	273.11	229.69	17.529	0.013
1–3	273.11	240.36	18.084	0.070
1–4	273.11	224.48	19.249	0.015
1–5	273.11	292.29	27.414	0.484
2–3	229.69	240.36	19.654	0.587
2–4	229.69	224.48	20.732	0.877
2–5	229.69	292.29	28.475	0.028
3–4	240.36	224.48	21.203	0.513
3–5	240.36	292.29	28.820	0.072
4–5	224.48	292.29	29.565	0.026
OSL (H(4) = 11.603, p = 0.021)				
1–2	260.46	237.48	17.511	0.189
1–3	260.46	248.08	18.065	0.493
1–4	260.46	222.72	19.229	0.050
1–5	260.46	315.35	27.386	0.045
2–3	237.48	248.08	19.634	0.589
2–4	237.48	222.72	20.710	0.476
2–5	237.48	315.35	28.445	0.006
3–4	248.08	222.72	21.181	0.231
3–5	248.08	315.35	28.790	0.019
4–5	222.72	315.35	29.534	0.002
Frugality (H(4) = 10.707, p = 0.030)				
1–2	255.19	240.85	17.526	0.413
1–3	255.19	277.58	18.081	0.216
1–4	255.19	212.02	19.246	0.025
1–5	255.19	266.48	27.409	0.680
2–3	240.85	277.58	19.650	0.062
2–4	240.85	212.02	20.728	0.164
2–5	240.85	266.48	28.469	0.368
3–4	277.58	212.02	21.199	0.002
3–5	277.58	266.48	28.814	0.700
4–5	212.02	266.48	29.559	0.065
Shopping for ideas (H(4) = 7.798, p = 0.099)				
Shopping for value (H(4) = 8.305, p = 0.081)				
Impulse buying (H(4) = 4.571, p = 0.334)				
Variety seeking (H(4) = 5.645, p = 0.227)				
Voluntary simplicity (H(4) = 5.421, p = 0.247)				
Minimalism (H(4) = 8.314, p = 0.081)				
Environmental consciousness (H(4) = 3.801, p = 0.434)				

Notes: The summary of the Kruskal-Wallis test is in grey above each table section; H is the test statistic with the degrees of freedom in (), and p indicates the statistical significance of the test.

and strain, together with an altruistic orientation, positivity biases regarding people's overall goodness, and an ability to be in control. Similar ambivalence appears among Cluster 4 consumers in our study, who paradoxically display indirect negative rebound effects but also positive direct rebound effects when they purchase clothes for themselves.

Study 2 thus confirms the complementary roles of OSL, hedonic shopping motives, and frugality in predicting the occurrence of direct and indirect negative rebound effects, such that high OSL and hedonic motives imply *thrill and pleasure seekers* in Cluster 5, whereas low scores on OSL, hedonic motivations, and frugality characterize the *contextually apathetic spenders* in Cluster 4.

5. General discussion

Most discussions of the sharing economy lean toward optimism. In theory, it can democratize marketplaces, create more opportunities for businesses and individuals, facilitate resource access, and increase environmental sustainability by curbing overall consumption (Eckhardt

et al., 2019). From a design perspective, ABS might provide a pathway to environmental sustainability (Tukker, 2004), but other changes in the consumption behaviors of ABS users also might offset some of the environmental benefits expected from these services, due to negative rebound effects. In our attempt to gauge the real outcomes of the sharing economy, we explore environmental rebound effects (Font Vivanco et al., 2016; Zink and Geyer, 2017), their heterogeneity across consumers, and the broader consequences of consumers' uses of ABS. In turn, we derive theoretical contributions, as well as insights and recommendations for practice.

5.1. Theoretical contributions

We respond to calls from Eckhardt et al. (2019) and Schaefer et al. (2021) to investigate the dark side of the sharing economy, as well as calls for further theoretical and empirical research on the factors that determine whether sharing practices enable improved sustainability (see Merino-Saum et al., 2023). First, we examine and provide empirical evidence of the environmental challenges related to consumers' use of ABS in the clothing industry, contributing to sparse literature that acknowledges the potential impact of ABS on sustainability from a consumer perspective (Meshulam et al., 2024). Unlike most studies of clothing rental, which center on non-users' adoption (Jain et al., 2022), our focus on actual ABS adopters in the clothing industry helps extend this stream of literature.

Second, we integrate ABS with ecological economics, environmental, and sustainability literature (e.g., Font Vivanco et al., 2016; Zink and Geyer, 2017) to investigate the specific influence of access-based consumption on consumers' consumption patterns, in accordance with the environmental rebound effect framework. In Study 1, we highlight the relevance of a novel social aspect that informs rebound effects, beyond their valence and direct or indirect type: the beneficiary of the increased (rebound) consumption. Including this novel factor offers a more in-depth understanding of how ABS can shape individual consumption behaviors, stimulate ripple effects across consumption categories, and evoke specific behaviors depending on the rebound beneficiary. Such differences are clearly evident across Clusters 1, 2, and 4 (purchases in the same product category for Clusters 1 and 4, purchases in different categories for Cluster 2). These findings contribute to existing evidence that consumers act differently when buying for others versus for themselves (e.g., Choi et al., 2006; Laran, 2010; Lu et al., 2016; Lu and Shang, 2021), here in reference to environmental rebound effects.

Third, our research complements insights into drivers of (Akbar and Hoffmann, 2018) and barriers to (Hazee et al., 2017) ABS by integrating environmental factors (Jain et al., 2022) and the potential for negative rebounds (Merino-Saum et al., 2023). Despite the importance of understanding how ABS influences consumers' (un)sustainable behavior (Roos and Hahn, 2017), most studies do not encompass the diverse spectrum of responses to ABS. As we show, using ABS can evoke both positive and negative rebound effects that are direct and indirect. We clarify that specific patterns of rebound effects emerge among different segments of consumers, such that for some users, ABS adoption in a particular product category implies increased demand for other offerings in the same category (direct negative rebound) or other categories (indirect negative rebound). In contrast with a conventional focus on young, female consumers (i.e., traditional clothes shoppers)—which persists even as men and older consumers exhibit increasing interest in their looks (Jain et al., 2022)—our Study 2 includes a representative adult population and thus a more accurate view of various users' behaviors. As it establishes, ABS adoption leads to negative rebound effects for many adopters. Thus, taking solely a design perspective on ABS is

shortsighted; behavioral insights are critical. Combining our findings with current knowledge about the drivers of ABS adoption (Merino-Saum et al., 2023) can provide a better account for how some benefits (drivers) of specific offerings might encourage unsustainable behaviors. In addition, we contribute to literature on ABS drivers and barriers by affirming the relevance of investigating negative rebound effects as potential barriers to adoption (i.e., consumers may decline to adopt an ABS offering due to the risk of negative rebound).

Fourth, research into the environmental impacts of consumer adoption of ABS has not addressed non-monetary mechanisms underlying rebound effects, despite their likely influence on environmental outcomes (Font Vivenco et al., 2022; Meshulam et al., 2023). By focusing on psychological factors underlying rebound behaviors, we offer new insights, such that we identify the concomitant roles of OSL, hedonic motivations, and frugality in determining negative rebound effects and shed light on their conflicting effects, depending on the type of rebound pattern. Both the highest and lowest levels of OSL and hedonic motivations appear in (different) segments that display negative rebounds. Thus, two different mechanisms may lead to negative rebound. On the one side, the OSL-hedonism mechanism evokes a generalized pattern of negative rebound in association with a search for stimulation and gratification (Study 1). On the other side, an apathetic spender mechanism also prompts indirect negative rebound effects; it was not identified in Study 1 but appears similar to the mechanism that underlies routine or inertial purchases. In these cases, consumers often ignore environmental criteria (Bray et al., 2011).

5.2. Managerial and policy implications

The clothing rental market is expected to grow strongly in the coming decade (e.g., Research and Markets, 2019; <https://www.businessscoot.com/fr/etude/le-marche-de-la-location-de-vetements-france>) and its environmental impacts strongly depend on consumers' behaviors (Kjaer et al., 2018). With the current findings, we suggest insights for managers and policy makers who seek to reduce the negative and boost the positive rebound effects of ABS. In particular, we suggest they focus on the segment of consumers, 7 % in our sample, who are at the highest risk of exhibiting negative rebound overall, as well as the 17 % at risk of indirect negative rebound. That is, approximately one-quarter of clothing consumers who engage in ABS exhibit potentially detrimental environmental behaviors. Identifying these consumers is crucial. Policy makers can avoid unintentionally providing incentives for damaging behaviors.

Furthermore, policy makers and managers should target communication at the identified segments, to increase their awareness of negative rebound effects connected with ABS solutions; similar to routine behaviors, some of their purchases might not reflect conscious choices. Proper communication might help increase such awareness. Traditional marketing fosters the unending pursuit of desires and perceptions of perpetually abundant resources (Csikszentmihalyi, 2000; Swim et al., 2011), which encourage unsustainable habits. To transform them, White et al. (2019) propose a shift from automatic to controlled processes. Sustainable consumption often involves replacing relatively automatic behavioral responses with more deliberate, effortful alternatives. According to the habit discontinuity hypothesis (White et al., 2019), altering the context in which habits arise makes it challenging to carry out the usual automatic behaviors. To disrupt stable contexts and automatic behaviors, appropriate options might include prompts, incentives, and feedback. Users in Cluster 5 may be more influenced by incentives such as rewards or gifts, to meet their needs for stimulation and pleasure. In contrast, users in Cluster 4 may respond better to

prompts or feedback, serving as reminders of the negative consequences of their habitual behavior; they are not actively seeking stimulation. By implementing strategies like prompts, incentives, and feedback, it may be possible to steer consumers away from automatic, unsustainable habits and toward more intentional and sustainable behaviors.

The empirical evidence of the ambivalent effects of ABS that we provide also suggests that managers should explicitly target renters in Clusters 1, 2, and 3 to boost positive rebound effects. In the clothing industry, managers can meet consumers' needs for variety by offering change, unusual stimuli, thrill, and diversity, which enables consumers to reach their OSL, such that they have little need to purchase clothes. Such efforts require an excellent understanding of the needs and preferences of consumers in connection with fashion trends, which even could entail involving consumers in value co-creation processes (Jain et al., 2022). Yet managers also should avoid highlighting only hedonic aspects of renting, which might unintentionally increase negative rebound effects (as exemplified by Sophie D. in Study 1). Targeting Clusters 4 and 5 is possible but requires the ABS providers to share insights about the environmental risks to reduce the potential for negative rebounds, across multiple product/service categories (i.e., indirect). Doing so also demands that managers have a holistic sense of the environmental impacts connected to renting their products. We call on companies in this sector to share information and collaborate to stimulate such understanding. In addition, sustainable services could aim to satisfy high OSL consumers in search of hedonic gratification, such as combining the clothing rental service with gamification on the website. Such bundles might help these consumers attain their OSL and their hedonic goals, without purchasing or consuming more products.

5.3. Limitations and further research

To identify positive and negative rebound effects of ABS, we study consumers' behavior in relation to the accessed products and how these ABS experiences shape their demand for both focal and other products and services. With this approach though, we cannot establish the net environmental impact of ABS compared with ownership of new or rented clothes. Further studies are needed to compare the effects of ABS consumption with other forms of consumption, for different segments of consumers. In particular, longitudinal research could define the relevant processes and how consumers' behaviors shift over time (Thomson and McLeod, 2015).

A non-negligible cluster of renters displays negative rebound effects and exhibits ambivalent purchase behavior in Study 2 (Cluster 4), but these apathetic spenders did not emerge in Study 1. Additional research is needed to understand why they engage in both positive direct and negative indirect rebound behaviors. Does inertia or disengagement play a role? Or is it a form of moral licensing (Blanken et al., 2015), a cognitive process by which people justify their immoral behaviors (e.g., driving more) by having previously engaged in moral behaviors (e.g., purchasing a more efficient car) (Truelove et al., 2014)?

Our study pertains to the clothing industry, which is a reasonable and relevant design choice, but we call for related research in other settings that exhibit different characteristics. For example, access to ski jackets might appear more functional than renting gala dresses, but fashion motives still might emerge ("You can rent a different brand name ski jacket every season, so it feels like new," [skigala.com](https://www.skigala.com)), as could saving arguments ("You get more and spend less," [skigala.com](https://www.skigala.com)). This relatively utilitarian context also might affect the frequency of indirect positive or negative rebound effects. Tests of completely different industries could affirm the generalizability of our results related to frugality, hedonism, and OSL (e.g., Amatuni et al., 2020). Fritze et al. (2020) assert that car-

sharing systems reduce car ownership but increase the number of drives, in line with our findings of both positive and negative rebound effects of ABS. However, consumers' need for variety, which relates to OSL, has not been investigated in more durable industries, such as car-, ride-, or tool-sharing contexts. Service providers might promise cars for each occasion, but such demand is more satiable and likely less vulnerable to negative direct rebound effects than in the fashion industry. Thus, studies should explicitly seek to identify how consumers behave when variety-seeking needs are lower and factors such as hedonism, OSL, and frugality seemingly are less relevant.

Finally, we touch on the tensions that firms likely face when adopting ABS, due to the trade-off between sustainability and profitability. From a business model perspective, service providers tend to allow consumers to buy rented products at any time (Le Closet) or at the end of the rental period (Coucou), which provides a source of liquidity and can create a platform for brands to increase sales through trial (Lehr et al., 2020). However, from an environmental perspective, granting consumers the option to buy rented clothes requires caution. First, service providers lose track of the clothes, which diminishes the circularity potential of ABS. Second, it tends to reduce the substitutability potential of access. High OSL consumers (such as those in Cluster 5) might be more inclined to make a purchase without sufficient forethought, which could lead to regret and unworn clothes. Further research should

address the sustainability–profitability trade-off for ABS providers.

CRediT authorship contribution statement

Pauline Munten: Writing – original draft, Supervision, Methodology, Investigation, Formal analysis, Conceptualization. **Valérie Swaen:** Writing – original draft, Supervision, Methodology, Formal analysis, Conceptualization. **Joëlle Vanhamme:** Writing – original draft, Supervision, Methodology, Formal analysis, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix 1:. Measurement scales

Attitudes toward renting (agreement from 1 to 5; adapted from Fritze et al., 2020; Lamberton and Rose, 2012) ($\alpha = 0.68$).

- I find that renting clothes is a good substitute for buying clothes.
- Renting a garment is just as satisfying as owning one.
- I prefer to buy a garment when I need it rather than rent it (reverse coded).

Motivations for shopping (agreement from 1 to 5; Arnold and Reynolds, 2003).

Adventure shopping (*).

- To me, clothing shopping is an adventure.
- I find clothing shopping stimulating.
- Clothing shopping makes me feel like I am in my own universe.

Gratification shopping (*).

- When I'm in a down mood, I go clothing shopping to make me feel better.
- To me, clothing shopping is a way to relieve stress.
- I go clothing shopping when I want to treat myself to something special.

(*) The hedonic shopping (5 items, $\alpha = 0.87$) scale combines the three gratification items with two adventure shopping items (cf. first item). Shopping for value ($\alpha = 0.78$).

- For the most part, I go clothing shopping when there are sales.
- I enjoy looking for discounts when I shop for clothes.
- I enjoy hunting for bargains when I shop for clothes.

Shopping for ideas ($\alpha = 0.86$).

- I go clothing shopping to keep up with the trends.
- I go clothing shopping to keep up with the new fashions.
- I go clothing shopping to see what new products are available.

Impulse buying tendency (agreement from 1 to 5; Weun et al., 1998) ($\alpha = 0.79$).

- When I go shopping, I buy clothes that I had not intended to purchase.
- I am a person who makes unplanned clothing purchases.
- When I see a garment that really interests me, I buy it without considering the consequences.
- It is fun to buy spontaneously clothes.
- I avoid buying clothes that are not on my shopping list. (reverse coded)¹

Variety-seeking tendency (agreement from 1 to 5; [Donthu and Garcia, 1999](#)) ($\alpha = 0.79$).

- I like to try different clothes.
- I like a great deal of variety in the clothing offer.
- I like new and different styles.

Frugality (agreement from 1 to 5; [Lastovicka et al., 1999](#)) ($\alpha = 0.79$).

- By taking good care of my possessions, I will definitely save money in the long run.
- There are many things that are normally thrown away that are still quite useful.
- Making better use of my resources makes me feel good.
- If I can re-use an item I already have, there's no sense in buying something new.
- I believe in being careful in how I spend my money.
- I discipline myself to get the most from my money.
- I am willing to wait on a purchase I want so that I can save money.
- There are things I resist buying today so I can save for tomorrow.

OSL (agreement from 1 to 5; [Steenkamp and Baumgartner, 1995](#)) ($\alpha = 0.82$).

- I like to continue doing the same old things rather than trying new and different things. (reverse coded)¹
- I like to experience novelty and change in daily routine.
- I like a job that offers change, variety and travel, even if it involves some danger.
- I am continually seeking new ideas and experiences.
- I like continually changing activities.
- I like to find some new and unfamiliar experiences.
- I prefer a routine way of life to an unpredictable one full of change. (reverse coded)¹

Environmental consciousness (agreement from 1 to 5; [Balderjahn et al., 2013](#)) ($\alpha = 0.91$).

I buy a garment only if I believe that....

- It is made from recycled materials.
- It can be disposed of in an environmentally friendly manner.
- It is packaged in an environmentally friendly manner.
- It is produced in an environmentally manner

Minimalism (agreement from 1 to 5; [Wilson and Bellezza, 2022](#)) ($\alpha = 0.84$).

- I avoid accumulating a lot of things.
- I limit the number of things I own.
- 'Less is more' when it comes to owning things.
- I actively avoid acquiring surplus assets.

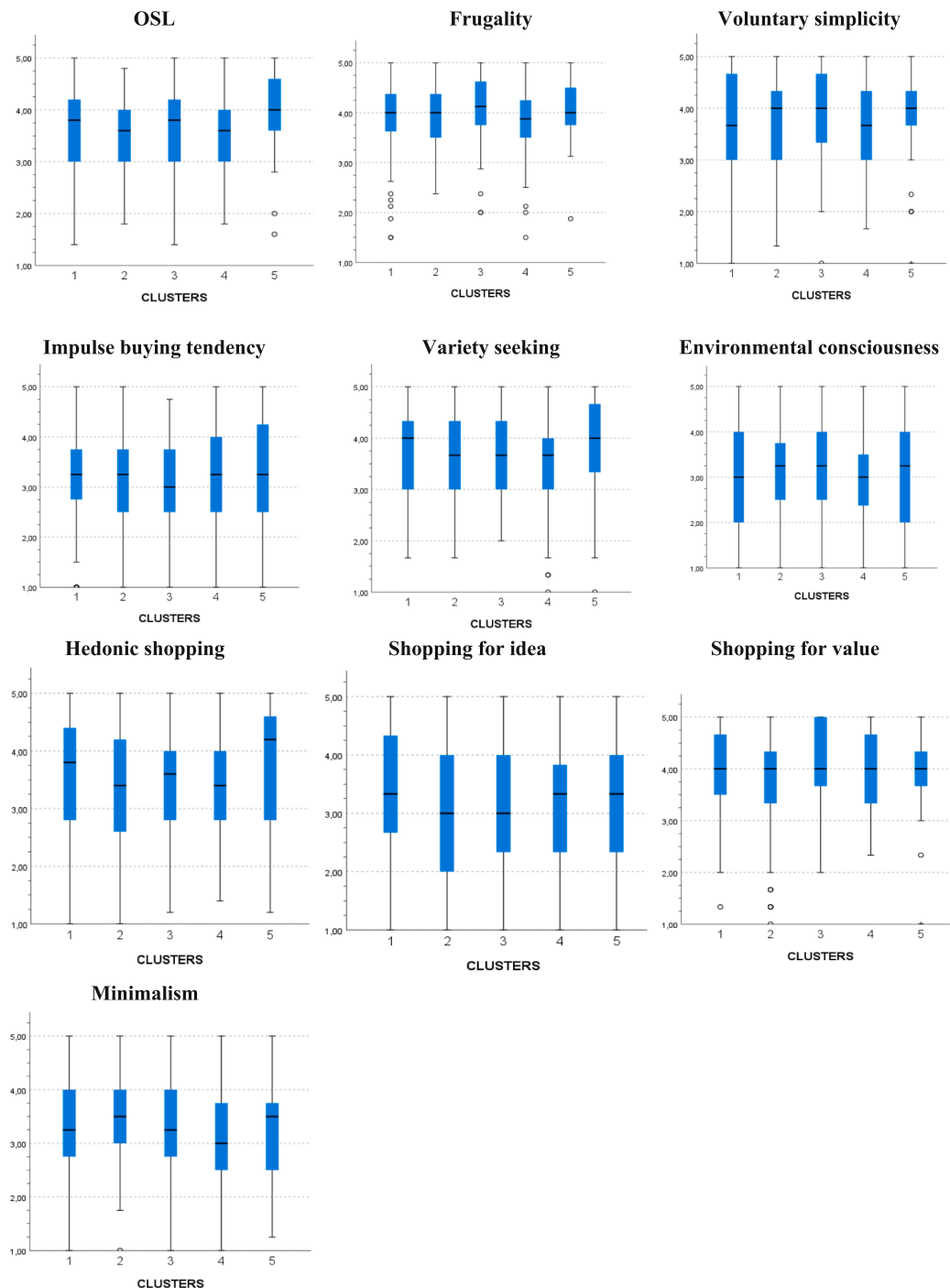
Voluntary simplicity (agreement from 1 to 5; [Balderjahn et al., 2013](#)) ($\alpha = 0.80$).

Even if I can afford it financially, I only buy an item of clothing if....

- I really need the clothes.
- It is a useful garment.
- I absolutely need this garment.

Notes: Items marked ¹ have been removed based on the factor analysis and reliability analysis.

Appendix 2: Distribution representation (box-plot) for all psychological variables



Notes: The line that divides each box shows the median. Each box spans the interquartile range (25–75 % of the data) with indicators of the minimal and maximal values in the data.

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