

From consumer adoption of clothes-service systems to positive and negative rebound effects

Abstract

Research on product-service systems (PSS) from a consumer perspective has mostly focused on consumers' drivers and barriers to access, but the effects of PSS on consumers' values and behaviors remains incomplete. While access can reduce consumers' need to own products and can encourage more sustainable behaviors, it can also lead to misbehaviors and increased consumption. Based on two case studies, we discuss the emergence of positive and negative rebound effects from consumers' adoption of clothes-service systems. We highlight that consumers develop coping strategies to maintain the accessed products in good condition; reduce impulsive purchases of new clothes, the number of rented clothes bought is not impacted however; and spend their savings to buy more of other goods or to buy items of better quality. This paper contributes to literature on rebound effects in circular economy and to literature on optimal stimulation level theory by linking it to rebound effects and impulse buying.

Keywords: Access-based consumption, case studies, rebound effects

Track: Services marketing

1. Introduction

Use-oriented Product-Service Systems (PSS) encompass integrated combinations of products and services (Baines et al., 2017) that rely on access-based consumption (Bardhi and Eckhardt, 2012), that is “*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*” (Schaefers et al., 2016, p.3). Renting and sharing are use-oriented PSS practices (Tukker, 2004) very well established in sectors, such as the mobility industry and consumer goods (PwC, 2015) or booming in other product categories such as clothing. Online clothing rental market size alone is estimated to reach \$1.856 million by 2023 ([Allied Market research, 2017](#)), rendering use-oriented PSS of strategic importance in terms of economic impact and sustainability issues.

Use-oriented PSS is often presented as a means to minimize environmental impacts of both production and consumption, by emphasizing the “sale of use” rather than the “sale of products” (Goedkoop et al., 1999; Mont 2002; Roy, 2000) and moving society towards circular economy (Tukker, 2004; 2015). However, critics denounce that use-oriented PSS does not guarantee environmental improvements if it is not specifically designed with this purpose (Braquet et al., 2016; Peruzzini and Germani, 2014).

First, it is expected that access leads to less product ownership (Belk 2010). Access is one possible alternative adopted by anti-consumption consumers (Ozanne and Ballantine, 2010). However, Bardhi and Eckhardt (2017) more recently argued that access can also evoke materialism and faster replacement of products for the next. In that sense, the positive relationship between access and lower level of acquisition is questioned (Seegebarth et al., 2016). Second, companies adopting access might positively influence consumers behavior (Bocken, 2017). Bocken and coll. (2018) show that access of washing machine encourages more sustainable user behaviors (e.g., reduction of the total number of washes) by increasing consciousness of personal consumption levels. Yet, access also creates negative rebound effects (Bartolomeo et al., 2003). Customers’ misbehaviors (e.g., not cleaning the car before returning it, even if made it dirty) are shown in car sharing systems (Schaefers et al., 2016). Finally, consumers involved in such forms of consumption do not seem to develop specific values or attitudes related to environmental sustainability (Roos and Hahn, 2017).

Our study investigates how consumers’ experiences with use-oriented PSS contribute to positive or negative rebound effects. Specifically, we analyze and discuss how consumers behave with the products accessed and how consumers’ experiences with use-oriented PSS

shape their demand for goods, based on data from two case studies collected in 2020 in the clothing industry.

With this paper, we extend the access-based consumption literature that mainly focus on their drivers (Hamari et al., 2016) and barriers (Hazée et al., 2017), by exploring their consequences on consumer behavior. We also contribute to the stream of literature on rebound effects in a circular economy (Zink and Geyer, 2017). Moreover, we build on coping strategies (Duhachek, 2008) and on optimal stimulation level and its link to variety seeking to explain the occurrence of rebound effects and a reduction in impulse purchases. We discuss our implications for public policy makers in the last section.

2. Rebound effects

Negative rebound effects are the “*environmentally negative second order effects from an initial service activity*” (Bartolomeo et al., 2003, p834) that offset sustainable efforts. Rebound effects are a general reason for being cautious in judging the environmental effects evoked by a service or a technological improvement (Binswanger, 2001) as use-oriented PSS. These effects occur when environmental improvements (e.g., emission savings) are lower than their potential efficiency-induced or sufficiency-induced savings (Santarius and Soland, 2018). Direct rebound implies that consumers’ environmental impact increases within the same category after they have switched to more efficient products or services (Chitnis et al., 2013) (e.g., consumers, switching from purchase to rental, buy more clothes because renting is cheaper). Indirect rebound derives from increased consumption in other categories of goods and services (e.g., leisure, shoes) that also cause CO₂ emissions. In the specific context of a shift from products to services, Bartolomeo and coll. (2003) highlight other types of rebound effects, such as change in the users’ felt responsibility for the equipment’s proper usage and maintenance. Rebound effects are often explained as an income effect and/or a substitution effect, due to increased purchasing power on consumption and/or changing relative income and prices. (Borenstein, 2013). Researchers criticizing these monetary induced explanations stress the importance of considering consumers’ motivations, preferences (e.g., Khan and Dhar, 2006) and psychological state (Blanken et al., 2015), as alternative explanations. In addition, rebound effects are not necessarily negative; positive rebound effects refer to consequences of a service or technological improvement for other processes whose effects relevant for sustainability are then modified positively (Hertwich, 2005).

3. Methodology

Cases were selected from use-oriented PSS in B2C, based on a criterion and maximum variation logic (Platton, 2004). We restricted sampling to cases in the clothing industry (i.e., Coucou and Le Closet), this sector being responsible for large sustainability impacts ([MacFall Johnson, 2020](#); [WRAP, 2017](#)). We choose clothes-service systems with heterogeneous designs in terms of temporality (see Bardhi and Eckhardt's 2012 classification). [Le Closet](#) is an online rental service that allows women to renew their wardrobe continuously based on monthly subscription packages starting at €39 for the classic offer (3 clothes + 2 accessories), with the opportunity to buy the rent clothes. [Coucou](#) is a physical rental store for festive outfits (e.g., dresses, pumps, headbands), that women rent for a weekend or up to 12 days, starting from €35.

We used a multi sources case approach (desk research based on websites, social networks, and journal articles, participant observations and semi-structured in-depth interviews with customers) to increase internal validity (Soy, 1997). We used remote video techniques for our interviews (King and Horrocks, 2010) due to the physical distance of the participants as well as the covid-19 situation. Using purposive sampling, we selected customers from Coucou or Le Closet social media platforms that were different in terms of length and times of clothes-service system use, positive and negatives opinion on the service and age. The sampling process ceased at theoretical saturation (Patton 2014) with 19 female customers from Le Closet and 12 female customers from Coucou, consistent with recommended sample sizes for exploratory research (McCracken 1988). Informants' ages range from early 20 to mid-50s. Closet's customers receive on average three 'Closet' a month; seven have been affiliated for more than two years and 12 for less than two years. Coucou's customers have rented five dresses on average (ranging from one to 15); seven have been renting dresses for more than two years and seven for less than 2 years.

The interview guide contained four parts: questions about (1) shopping habits (e.g., 'If I say "go shopping", what do you spontaneously think of?'), (2) respondents' perception of access-based services, (3) respondents' purchase of clothes and access to other product categories, and (4) concluding ideas.

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

emerging themes. We followed a within-case and cross-case analysis (Eisenhardt 1989). We compared and contrasted our findings with extant literature to situate results into preexisting knowledge, deepen insights, and sharpen the limits to the generalizability of our results (Baxter and Jack, 2008). To enhance the credibility of our findings, we applied data sources and research triangulation (Patton, 2004). To enhance confirmability, two independent judges are currently coding, data from five randomly selected interviews using our coding grid (16.12% of the sample), which exceeds the recommendation to use 10% of the sample to achieve representativeness (Lombard et al., 2002). Three other independent judges are also assigning the themes and statements of the coding grid to the categories. Finally, we plan to discuss the results with the founder of another clothes-service system.

4. Findings

We identified three types of positive or negative rebound effects, which we discuss next.

4.1. Usage rebound effects

Our findings highlight a strong sense of customers' responsibility for the clothes and accessories they are accessing and an absence of deliberate misbehaviors. Four distinct factors explain this result. First, the presence of a supervisory service and the risk of being detected act as an inhibitor of deliberate misbehavior (Fisk and Collins, 2010). The clothes indeed return to the service provider what leads to a higher chance of product damages being detected:

"There was a jumpsuit where I made a hole! (...). It doesn't show that much. But they [ndlr: Le Closet] would have seen it!" (S  verine, le Closet). Informants suggest that staining or tearing the clothes (in an irreversible way), and giving them back in that condition made them feel *"embarrassed"*, *"freaked out"*, *"worried"* or *"preoccupied"*. Second, consumers' feeling of being part of a community and accessing collective goods (that is "ours"), increase their perceived responsibility to care for the good (or stewardship behavior; Peck et al., 2020). For example: *"We agree that this good is a common good, and that we are all 'the mothers' of this good. Therefore, we must pay attention to this good" (Catherine, Coucou).* In addition, informants adopting the service for a long-time report feeling of possession (Mifsud et al., 2015; Pierce et al., 2003), (that is "mine"): *"It's actually become my way of consuming clothes, so it's actually my clothes. So I don't pay more or less attention."* (Isabelle, Le Closet). The other two factors rely on informants' educational values, and high-end perception of the accessed products.

Informants also applied coping to avoid unpleasant situations related to damaged clothes. Coping strategies are the thoughts and behaviors to manage situations that are

appraised as stressful (Lazarus and Folkman, 1984). Two broad classes of coping are commonly identified: problem-focus coping involves addressing the problem causing distress, and emotion-focused coping is aimed at ameliorating the negative emotion associated with the problem (Folkman and Lazarus, 1980). Our findings suggest that coping strategies most often appear in relation to the first type; this prevalence of problem-focus coping strategies might explain why access does not lead to product misuse. Some informants **restrain** from wearing access-based clothes in potentially ‘threatening’ situations (e.g., when working with children). Other informants **adapt** their choice of access-based clothes to the situation (e.g., H       chose delicate clothes only for special occasion, delicate clothes). Informants like S         seek **to repair** their mistakes (both materially and financially), as their coping process is more adaptive and dependent on the context (Folkman and Moskowitz, 2004). If S         happens to damage a piece of clothes although being careful, she buys it and sews it up. Finally, one of our informants seeks **to distance** herself (recognizes the problem but deliberately makes efforts to put it out of her mind; Billings and Moos, 1981). Sonia took the insurance as a way to wear the clothes without being worried: *“Even if I damage something, it’s ok!” (Sonia, Le Closet)*. Most informants’ choice not to enact such distancing strategy might also explain consumers’ responsibility toward the accessed clothes (see Durgee and O’Connor, 1995).

4.2 Direct rebound effects: consumers’ impulsive purchases of new or rental clothes

The adhesion to clothes-service systems seem to reduce our informants’ level of *“compulsion”, “impulse”* and *“frustration”* with regards to the purchase of new clothes by satisfying their variety seeking needs. Some informants are even not doing shopping for new clothes at all any longer: *“I realized that my need for novelty, for change, not to be dressed the same all the time, is a need that defines me quite well! 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 didn’t have to buy stuff anymore so I wouldn’t always be the same” (Ingrid, LeCloset)*.

Ingrid’s narrative focus on how clothes service system responds to her need for change and novelty. Ingrid needs for change (or variety-seeking trait) may be attributed to her optimal stimulation level (OSL) (Raju 1980). Consumers’ OSL refers to every individual most preferred level of stimulation. When consumers’ actual stimulation level is below their OSL, they attempt to increase stimulation through exploratory behaviors (e.g., risk taking, and variety seeking) (Joachimsthaler and Lastovicka, 1984). That is, receiving “novel” clothes on a regularly basis is a way for Ingrid to be stimulated. By raising her stimulation to OSL, she reduces at the same time her impulsive need to purchase new clothes.

We identify that clothes-service system stimulates our informants and answer consumers' need for changes and/or novelty through four factors. First, **change** (Mehrabian and Russell, 1973) as illustrated by Ingrid relies on the reception of novel clothes on a regularly basis. Second, access to **unusual stimulus** (Mehrabian and Russell, 1973) accounts for the possibility to wear original pieces that our informants would not buy otherwise: *"Sometimes, we want things to change and we don't dare and there for the blow, for example, this week, with the Closet, I took purple pants. I would never have bought purple pants"* (Fanny, *Le Closet*). Third, **thrift** (Zuckerman, 1979) evokes informants feeling of surprise when receiving their rented clothes, as Marina explains: *"Every week, every time, I watch my mailbox and in fact, it's like getting a little gift. I always look forward to opening it. I directly try on all the clothes."* (Marina, *Le Closet*). Finally, clothes-service systems also provide informants with **variability**: *"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, *Le Closet*).

Consumer finds an optimum level of stimulation to be most comfortable (Fiske and Maddi, 1961). According to this approach, exploratory behavior is manifested whenever the actual level of stimulation is below OSL. On the other hand, when the actual level reaches OSL, consumers have less need to explore their environment (Reynolds, 1962). Thus, if our informants attempt to maintain environmental ambiguity or stimulation at an optimum through access, it might explain why they are less impulsive in her purchase of new clothes when going shopping, as Florence says: *"'Oh that's nice!'! But I can have it on Le Closet too, so I'm not going to buy it"*. (Florence, *Le Closet*). Finally, when consumers stimulation level is above OSL, they may not tolerate any increase in stimulation, which in this case creates discomfort (Berlyne, 1960). Angélique explains that for her, at some point, stimulation from change in the clothes-service system would be overwhelming; leading to less purchase of clothes too. *"I would have had another [ndlr: clothes], it would have been too much. It's like subscribing to newspapers ... Well, I had no more time to read them. It became an obligation to read (...) it was no longer a pleasure, it was an obligation. The clothing, after that it would have been almost the same."* (Angélique, *Le Closet*).

The reduction in impulse purchases of new clothes was predominant among informants who sought hedonic (vs utilitarian; Babin et al., 1994) benefits from clothes purchase before subscribing to the clothes-service system; informants who sought utilitarian benefits from shopping already displayed a behavior characterized by forethought and reflection. Informants who sought hedonic benefits from clothes purchase and engaged in the

clothes-service system for environmental reasons (Barbopoulos and Johansson, 2016) display the strongest reduction in impulsive purchases, because they consider the purchase of new clothes as inappropriate (O'Guinn and Faber, 1989). In addition, they consider that access becomes useless if they succumb to the temptation of purchasing rented clothes; thereby avoiding negative rebound effects (Azevedo et al., 2013). The reduction in consumers' impulsive purchases was less radical and more progressive for informants who sought hedonic benefits from shopping and engaged in clothes-service system for hedonic reasons (Hirschman and Holbrook, 1982). While their impulsiveness to buy new clothes decreased, it remained *"hard"*, *"violent"*, and sometimes *"frustrating"* for them to resist buying the rented clothes, and were more likely to indulge in buying them.

The stimulation created by access has thus different consequences on consumers' behaviors. This might be explained by the existence of different levels of OSL for different individuals (Joachimsthaler and Lastovicka, 1984). Consumers driven by hedonic benefits of clothes-service systems may display higher OSL (Baltas et al., 2017). Access then does not raise consumers' stimulation level to optimal, explaining the reduction in impulsive purchases of new clothes, but not in rented clothes. Another explanation is that the reduction in impulsive buying of rented clothes requires more time for some consumers: consumers perception of a product or service usefulness for satisfying a specific need is, to a certain extent, subject to learning processes (Witt, 2001). Informants who adhere to clothes-service system may take some times to reduce the impulsive purchase of rented clothes, as Julie explains: *"I think the path continues as it goes. (...) Sometimes I realize that when I buy my Closets [ndlr: rented clothes],... afterwards I tell myself that I shouldn't have necessarily bought them back! It's gradual."* (Julie D, Le Closet)

Finally, while access reduces informants' impulsive purchases, it can also reinforce consumerist values, by increasing the need for change: *"If I change the color of my kitchen, (...) I wouldn't go and buy a new coffee maker if it is not the right color. However, if (...) you rent it, you don't care! Afterwards, it is a mode of consumption which is extremely... futile in itself, because (...) it responds to a want more than a need"* (Hélène, Le Closet)

4.3 Indirect rebound effects

Consumer's adoption of clothes-service systems has implications on their pattern of consumption for products and services in general (Binswanger, 2001). Behavioral adjustments are connected to a saving effect (Greening and Greene, 1997). Most participants engaged in access to control better their budget for clothes (*"I had no idea how much money I was spending at all! Now, I know I'm paying 39 euros, no more"* -Jenny, Le Closet) and/or to

reduce it (*"Just watch my budget. I don't want to spend too much money just on clothes"* - Isabelle C., *le Closet*) as Möhlmann (2015) contends. We observe two types of behavioral adjustments (increase in consumption and change in consumption) and a status quo. The first type of behavior is illustrated by Hélène: *"I realize that I transfer this budget to my children: I consume more for the girls than they would need. And, I also consume more for shoes and sometimes, I allow myself to buy myself something else. It's my choice!"* (Hélène, *Le Closet*). Hélène carries over the initial budget dedicated to clothes on other product categories/services or for others than herself. While informants' needs regarding their own clothes are satisfied, other needs arise and drive additional consumption behaviors (Azevedo et al., 2013; Wörsdorfer, 2010), which constitute a negative rebound effect.

Second, consumers like Sophie report that as a result of cost savings induced by the clothes-service system, they dispose of a *"qualitative budget envelope"*. This envelope allows them to make more responsible choices for their clothes but also for other products categories. For example: *"it makes 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., *Le Closet*). This change in individual behavioral patterns constitute a positive rebound effect of clothes-service system (Druckman et al., 2010).

Third, the status quo: *"I earned 100 € per month, but I do not spend them on other things"*. (Typhaine, *Le Closet*) Consumers like Typhaine access clothes because her need for variety is important in that product category. Yet her OSL is lower in other product categories. Typhaine's intrapersonal differences in OSL (Wahlers and Etzel, 1985) may explain that she is not using the savings gained from rented clothes, on quantities nor on quality; which reflects an absence of positive and negative rebound effects.

5. Conclusion

The objective of this paper was to understand the relationship between consumers' adoption of use-oriented PSS and the emergence of positive and negative rebound effects, based on two case studies in the clothing industry. We contribute to the access-based literatures by showing that the adoption of use-oriented PSS has direct and indirect effects on consumers' behaviors, and these effects are either positive or negative. First, informants display low levels of negative rebound effects with regard to product care, that we discuss with regards to consumers' adoption of coping strategies. Second, informants adopting clothes-oriented PSS report being less impulsive in their purchases particularly for new clothes but not for rented clothes bought. We discuss how the optimal stimulation level theory

accounts for this effect. Access however triggers consumerist values. Finally, we also see that most respondents save money when subscribing to clothes-service systems. They use their savings either to buy better quality (i.e., longer lasting, ecofriendly) products or to buy more of other goods, leading to positive and negative rebound effects, respectively.

We also contribute to research on OSL that does not directly explore the role of optimal stimulation level in reducing consumers' impulsive purchase (Sharma et al., 2010), as we highlight in our paper.

Finally, from a practical point of view, our research provides empirical evidence about the ambivalent effect of use-oriented PSS on sustainable consumption behaviors. Public policy, associations and managers concerned with access should take initiatives to develop specific PSS environment (e.g., supervisory service, community feeling) in which consumers contribute to value creation by developing adaptive coping strategies; avoiding deliberate misbehaviors. Public policy and associations should also be careful of the model of access when defending their environmental promises because we observe that access continues to cultivate the need for possession (purchase of rented clothes, and increased aggregate demand). Moreover, use-oriented PSS should be targeted at specific consumers groups to deliver its promises, as reducing impulsive purchases of hedonist customers.

6. Key references

- Baines TS, Lightfoot HW, Evans S, Neely A, Greenough R, Peppard and Alcock JR (2007) State-of-the-art in product-service systems. In: Proceedings of the Institution of Mechanical Engineers, Part B: *Journal of Engineering Manufacture* 221(10): 1543-1552.
- Bardhi F and Eckhardt GM (2012) Access-based consumption: The case of car sharing. *Journal of consumer research* 39(4): 881-898.
- Bartolomeo M, dal Maso, D, De Jong P, Eder P, Groenewegen P, Hopkinson P, ... and Slob A (2003) Eco-efficient producer services—what are they, how do they benefit customers and the environment and how likely are they to develop and be extensively utilised? *Journal of Cleaner Production* 11(8): 829-837.
- Lazarus, R. S., & Folkman, S. (1984). Stress, appraisal, and coping. Springer publishing company.
- Mehrabian, A., & Russell, J. A. (1973). A measure of arousal seeking tendency. *Environment and Behavior*, 5(3), 315.
- Punj G (2011) Impulse buying and variety seeking: Similarities and differences. *Journal of Business Research* 64(7): 745-748.
- Raju, P. S. (1980). Optimum stimulation level: Its relationship to personality, demographics, and exploratory behavior. *Journal of consumer research*, 7(3), 272-282.
- Tukker A (2015) Product services for a resource-efficient and circular economy—a review. *Journal of Cleaner Production* 97: 76-91.
- Zink, T., & Geyer, R. (2017). Circular economy rebound. *Journal of Industrial Ecology*, 21(3), 593-602.