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Revealing patterns in household product consumption and sharing: An approach to support urban governance towards a sustainable sharing economy

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ABSTRACT

To accomplish the sustainability potential of the sharing economy (SE), there is a need for proactive governance of the SE. In this paper, we aim to generate knowledge on household product consumption and sharing to support SE governance in Gothenburg City (Sweden). Data from two independent cross-sectional questionnaire surveys were statistically analyzed, which generated insights within 7 product groups covering household durables; and within 20 demographic categories regarding gender, age, dwelling type, education level, family composition, and income. Results were in accordance with the well-known attitude-behavior gaps regarding sustainable practices, though variance was seen for these gaps depending on the product and demographic group considered. The study suggests that, for 2021, clothes were consumed in high amounts (units/year) but there was relatively low interest and participation in sharing them, while the opposite was seen for tools and leisure items. As for demographic groups, men were less likely than women to reduce their consumption through participating in sharing, contrary to respondents with higher education. Governance reflections are included for the highlighted cases, such as investigating the reasons why men are less interested in the SE and in reducing their consumption; and exploring hinders to achieving a critical mass of users and providers in clothes sharing.

1. Introduction

The growing levels of resource use, particularly those resulting from household product consumption, have a critical role in the over-exploitation of natural resources. The United Nations proposes a set of Sustainable Development Goals (SDGs), and among them, the *SDG 12 – Sustainable consumption and production* focuses on alleviating the consequences of increased resource use (United Nations, 2021a). SDG 12 is supported in circular economy (CE) strategies, including the reduction of material use, waste and recirculation of products (United Nations, 2021b). In turn, dematerialization also aims to reduce material extraction, use, and disposal (Kallis, 2017).The sharing economy (SE), a strategy that can be applied at the household level, promises to "not only accelerate circularity, but also the dematerialization of the economy and Europe's dependence on primary materials" (*European Commission*, 2020a).

At its core, the SE consists in the redistribution of household goods, services, and spaces; often with the purpose of tapping into their underutilized capacity, and through activities such as lending, borrowing, and renting; swapping, gifting, and selling and buying used products (Curtis and Lehner, 2019). These actions have the potential to reduce the consumption of newly produced goods, and therefore, the associated material use and emissions, i.e. dematerialization. Thus, the SE is instinctively associated with environmental sustainability by users and governmental institutions alike (Hossain, 2020; Schor and Wengronowitz, 2017). However, as the research field grows, it becomes increasingly clear that the SE does not always fulfill the promise of sustainable outcomes. Academics are concerned about the possibility of rebound effects, such as an increased consumption of household products as a direct consequence of sharing. This commonly occurs when income that is freed up by sharing is used to purchase other products, or if sharing is used as a try-out before large product purchases (Frenken,

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2017). Rebound effects may therefore jeopardize dematerialization even when circular consumption habits are adopted.

Recent literature highlights the role of urban governance in ensuring a sustainable SE. Henry et al. (2021), for example, pose that the establishment of the SE in cities needs to be solidified through approaches similar to CE governance. This involves establishing "aspirational visions", rather than reacting to specific "incidents" that arise through the SE (e.g., the introduction of regulations for AirBnB after its negative effects on the housing market in the Netherlands; Voytenko Palgan et al., 2021). Other authors propose the intentional "design" of the SE, which includes strategic regulation and government-led implementation of SE initiatives in cities. In some cases, this urban governance has been supported by investigation programs such as Sharing Cities Sweden (2021a). However, the ability of local governments to properly address the SE depends on the types of information that are produced through SE-related research.

Regarding this, the SE has usually been investigated through in-depth approaches, focusing on one or few shareable products (Strulak-Wójcikiewicz and Wagner, 2021), specific business models (Noh et al., 2020), single sharing initiatives (Shmidt, 2019), and limited households or user profiles (Morone et al., 2018; Yates, 2018). However, the SE can be considered a complex phenomenon, where the attitudes, participation rates, and perceptions of the SE's challenges and benefits change across participants, activities, assets, and contexts. A holistic research approach is needed to address this complexity, and in turn, to support a proactive and contextualized local governance (Gurău and Ranchhod, 2020).

Furthermore, to be able to properly govern the SE in a way that contributes to the prevention of rebound effects, there is a need to couple consumption and sharing studies. While the research field of household consumption is extensive, few studies have considered consumption in relation to sharing (among these Beretta et al., 2021, and Esposti et al., 2021). Most often, sharing has only been mentioned as a pass-by suggestion to reduce consumption (for example, in Chen et al., 2018), thus there is a lack of studies that explore which circumstances are more likely to lead to a decreased consumption due to sharing.

To address the lack of approaches that study consumption in relation to sharing, Gothenburg Municipality (Sweden) has been chosen as a case. Gothenburg has a rich SE landscape, and the Municipality has been actively engaged in promoting the SE as a tool to achieve its climate and sustainability goals (Voytenko Palgan et al., 2021). At the same time, the local authorities identify SDG 12 as particularly challenging due to prevailing high incomes and private consumption levels (Göteborg Stad, 2021). We partake in applied research through a collaboration between academia (the authors of this paper) and local government representatives. Through the collaboration, we established the aim of generating detailed knowledge of consumption and sharing patterns to support local authorities in potentiating dematerialization through the SE. We adopt two research objectives (ROs), namely, exploring patterns from the perspective of product groups (RO1) and the perspective of demographic groups (RO2). For each RO, both attitude and behavioral patterns were considered. While the study does not engage in the prosumer discussion, we intend to investigate the roles of private persons who could contribute to dematerialization as providers and consumers in the SE.

The ROs were addressed through the analysis of data from two independent questionnaire surveys. In total, we investigated 60 product types within 7 product groups, and ca. 20 demographic categories within 7 different household and individual attributes. With this measure, we intended to highlight how different products and demographic groups have the potential to reduce the occurrence of rebound effects. Further, we comment on the role of governance in addressing each highlighted case.

2. Literature review

In this literature review, we touch upon relevant concepts for our work – namely, the definition of the SE; relevant products, assets, and roles; user perspectives in SE research; and governance of the SE.

2.1. Sharing economy

2.1.1. Definitions

The "sharing economy" (SE) is a contested concept with differing definitions across academia. Within the SE, some authors only include actions that grant temporary access to assets, such as sharing, lending, borrowing, and renting (Belk, 2014; Eckhardt et al., 2019; Frenken and Schor, 2017), while others include permanent transactions as swapping, gifting, selling and buying used products (Benkler, 2004; Muñoz and Cohen, 2017; Schor, 2016). Further, the transactions could be monetized (e.g., renting, co-buying) (Eckhardt et al., 2019) or not (e.g., lending, swapping). Depending on which of these aspects are considered, definitions go from more restrictive models (e.g., Belk, 2014) to broader definitions (e.g., Botsman, 2013). The literature also recognizes "close cousins" of the SE, which overlap with other SE definitions. Among these are the terms "collaborative consumption" (CC) (e.g., Hamari et al., 2016; Benoit et al., 2017), "gig economy" (Acquier et al., 2017), "access-based consumption" and "access-based services" (e.g., Bardhi and Eckhardt, 2012; Schaefers et al., 2016).

The primary objective of this paper is to enable is to enable a reduction of consumption through sharing activities, by reducing the amount of newly manufactured products being purchased by households. Accordingly, we include in the paper any sharing actions that have the potential to achieve this. We adopt a comprehensive definition of SE, inspired by Muñoz and Cohen (2017), Schor (2016), and Botsman (2013), encompassing both permanent and temporary transactions, whether monetary or non-monetary. Moreover, our approach not only includes literature specifically termed as SE but also integrates closely related concepts such as "CC".

2.1.2. Types of assets

In research, shareable assets have been studied both through observations and theoretical classifications. Curtis and Lehner (2019) highlight that both intangible (e.g., services, knowledge, time, etc.) and tangible (e.g., products) assets can be shared. Specifically, tangible durable products like cars, bikes, sports equipment, electronics, kitchen items, and furniture are notable for not deteriorating quickly and often having a high idling capacity (i.e., they stand unutilized or "idle" for long periods, even if they are still functional). Thus, the sharing of tangible items has the potential to contribute to dematerialization. Conversely, non-durables encompass assets like clothes and food. Agyeman et al. (2013) and Owyang et al. (2013) offer broader categorizations, ranging from materials and products to capabilities, wellbeing and space. Cohen and Muñoz (2016) provide a functional classification, distinguishing loaner products (shared temporarily), pre-owned goods (relocated permanently), and library-shareable items. However, due to the significant influence of platforms like AirBnB and Uber, much of the literature and media focus on accommodation and transportation, accounting for over 80 % of mentions in news articles (Leung et al., 2019). This leaves the study of other shareable household products overshadowed. Because of this, we seek to elaborate on the sharing of tangible products, excluding mobility and food (see a complete list in Appendix D – Table D.1).

2.1.3. Roles in the sharing economy

The literature reveals variations in the roles and actors involved in the SE. Leung et al. (2019) categorize SE interest groups as platforms, consumers, providers, and others like government and community. Curtis and Lehner (2019) further discuss how actors, from individuals to businesses, assume varying roles according to the SE platform model: in

B2C models, businesses typically "provide" assets, with households as "consumers", whereas P2P models see households providing to other consumers in a peer-to-peer format. Benoit et al. (2017) refer to P2P as a "triadic exchange" involving customers, peer service providers (i.e., who provide assets through an online platform), and platform providers. The latter are also termed "mediators" or "intermediaries" who are responsible for regulating the transaction between customers and peer service providers (Eckhardt et al., 2019; Sutherland and Jarrahi, 2018). Acknowledging businesses as intermediaries, Puschmann and Alt (2016) refer to P2B2P. On the other hand, marketing literature often consolidates providers and consumers into the term "prosumer" (Magnusson and Palm, 2019; Xiang et al., 2022). Eckhardt et al. (2019) support this by noting that, in economically driven P2P sharing, private users engage in roles traditionally attributed to producers (e.g., producing value from their goods and quality control) while simultaneously consuming their assets to produce that value. In this paper, however, as we include SE activities corresponding to B2C and P2P, we address the roles of consumer and provider while making no explicit consideration towards "prosumers".

2.2. User perspective in the sharing economy

The user perspective has been among the most studied topics in the SE field, encompassing attitudes, motivations, and participation barriers. Primary motivators for the SE include convenience; hedonic value; and environmental, economic, and social sustainability benefits (Hamari et al., 2016; Hazée et al., 2020; Hossain, 2020). Interestingly, sustainability claims in SE are often grounded in actor motivations rather than empirically measured (Geissinger et al., 2019). As for barriers, Hazée et al. (2020) outline two primary types: functional barriers (like the complexity of the innovations and potential risks) and psychological barriers (such as lack of compatibility with previous habits and concerns about sharing). Additionally, user perspectives may vary based on socio-demographic factors, shareable assets, and transaction roles (Böcker and Meelen, 2017). Accordingly, this paper seeks to investigate the potential of dematerialization through sharing according to products and demographic factors, while also considering the role that users might engage in. The sub-sections below outline some investigated user perspectives according to these three factors, and Table 1 presents an overview.

2.2.1. According to role

Ertz et al. (2017) saw that both consumers and providers were governed by similar motivation groups, namely utilitarian (e.g., economy, pragmatism), experiential (e.g., social contact, originality, treasure hunting), protester (e.g., anti-commercialism) and spiritual (e.g., ecology, ethics, altruism) motivations. Similarly, Böcker and Meelen (2017) didn't find significant differences between the two roles regarding social and environmental motivations. Benoit et al. (2017), on the other hand, perceived differences according to user roles: Consumers valued savings, social interaction, and unique experiences, whereas providers appreciated additional income and flexibility in offering their products. Notably, only consumers were driven by environmental motives, including resource efficiency. Böcker and Meelen (2017) also found differences in role motivations according to products, noting that sometimes, consumers prioritize economic benefits over providers. As for P2B2P platforms, Bellotti et al. (2015) studied the motivations of the intermediaries and stated that, while service providers emphasize idealistic motivations, consumers and providers favor practical ones. Hansmann and Binder (2023) also considered reciprocal sharers (who both consume and provide). This group had stronger ecological, social, and economic value orientations than unilateral sharers.

In terms of barriers, consumers are challenged by product quality variability in SE offerings, and providers have concerns over how consumers will treat their products (Böcker and Meelen, 2017). Eckhardt et al. (2019) emphasize barriers that apply to both consumers and providers, like mistrust and fear of contaminated products. Laurenti and Acuña (2020) also mention the expected user effort in P2P transactions, but interestingly, they found that the risk of unavailable products did not affect the attitude towards the SE.

2.2.2. According to products

Interest in the SE might vary greatly depending on the shared product (Botsman and Rogers, 2010; Eckhardt et al., 2019). Böcker and Meelen's survey in Amsterdam (2017) revealed that most respondents were likely to use shared power drills and accommodation, but fewer were interested in sharing cars and meals. Laurenti and Acuña (2020), on the other hand, found that university students and employees were most interested in sharing services, followed by study materials (e.g., books), tools, and leisure items. Hansmann and Binder (2023) also saw that the role distribution varied per product: drills, camping tents, and ski gear had significantly more consumers than providers, while interest was roughly equal for cameras and kitchen equipment.

The varying levels of interest are likely driven by product-specific characteristics. Kim and Jin (2020), for example, stated that sharing intangible goods is entirely different from tangible goods, due to the greater control and psychological ownership related to tangibility. Additionally, Gullstrand Edbring et al. (2016) found that most people were positive towards sharing products made with hard materials (e.g., tables and chairs); as opposed to soft-material items (e.g., bedding, towels, and mattresses) that presented obstacles such as hygiene and pests. An exception was kitchen utensils which, although made with hard materials, were less attractive for sharing. This coincides with Hazée et al. (2019), who found that contamination concerns become more important when sharing products that are close to the body.

Kim and Jin (2020) also addressed motivations for tangible goods. For tangible goods, sustainability, social contact, cost-saving, variety-seeking, and the fun of using new access models were more important than convenience. This variation is probably related to the perceived barriers in searching, delivering, and paying for shared goods, as opposed to the perceived convenience of accommodation and mobility sharing. Nonetheless, it must be considered that the literature exploring user perspectives of shared tangible products is scarcer than the literature on accommodation and mobility sharing (Hossain, 2020).

2.2.3. According to socio-demographic characteristics

Often, survey studies have investigated SE perspectives according to age, gender, education, and income levels. Results related to these characteristics are outlined below. Other authors include employment status, civil status, household type, and composition - for related insights, see Ertz et al. (2017), Lindblom and Lindblom (2017), Buda et al. (2020) and Leland et al. (2023) in Table 1.

Age has consistently had a significant effect on sharing. For Lindblom and Lindblom (2017), the younger groups had the most positive SE attitudes, intentions, and interest in reducing ownership, similar to the results of Buda et al. (2020) and Leland et al. (2023). Age may also affect the user role distribution, as Hansmann and Binder (2023) saw that young people were more active in both consumer and provider roles. Böcker and Meelen (2017), Ertz et al. (2017) and Jelinkova et al. (2021) posed that young people perceived the SE as more beneficial than older respondents in the areas of economy, utilization of resources, convenience, access to unusual experiences, environmental protection, and anti-commerciality; while older individuals were more socially motivated.

Another characteristic with a consistent effect on sharing is education level. In the studies by Lindblom and Lindblom (2017) and Buda et al. (2020), education had a positive correlation to sharing and de-ownership attitudes. Individuals with medium or low education levels were less environmentally motivated than their counterparts, while individuals with high education were less socially driven and more economically motivated to participate (Böcker and Meelen, 2017; Jelinkova et al., 2021). Higher levels of education were also correlated

Table 1
Overview of selected studies about the user perspectives of the SE. We classify the studies according to their analytical perspectives: whether they provide insights on sharing roles, shareable products, and/or socio-demographic characteristics. The research context for each study is also included.

Authors, research context	Analysis perspectives			Findings
	Roles	Products	Socio-demographic characteristics	
Bellotti et al. (2015) Context: United States	Peer-to-peer service providers, users of P2P services (consumers and providers)	–	–	• Service providers place great emphasis on idealistic motivations such as creating a better community and increasing sustainability. • Consumers are looking for services that provide what they need (utilitarian motivations) whilst increasing value and convenience. • Providers are most motivated by payments. Other providers´ motives are more mixed than consumers´, including instrumental motivations, social, leisure, altruism, etc.
Gullstrand Edbring et al. (2016) Context: Swedish IKEA consumers between ages 20–35	–	Furniture and household products	–	• The most popular motivations were economic gains, the desire to be unique, access to high-quality products, fun, and environmental reasons. Obstacles referred mostly to concerns for hygiene, pests, and desire for new products. • Most respondents were favorable towards second-hand buying of tables and chairs but reacted negatively in the case of mattresses, sheets, or towels. Respondents were also very negative towards renting or leasing home textiles, beds, and kitchen utensils, but positive towards renting home appliances, tables, chairs, and shelves. Exploratory results indicated that tools were the most attractive product for consuming together with other people, while kitchen utensils were seen as unsuitable. • The youngest group of respondents (age 20–24) replaced products due to seeking novelty, while slightly older respondents (25–35 years) were more likely to replace products due to damage.
Benoit et al. (2017) Context: -	Peer-to-peer platform provider, peer consumer, peer provider	–	–	• Consumers value savings, social interaction, and unique experiences. Only consumers are driven by environmental motives, including resource efficiency. • Providers appreciate additional income and flexibility in offering their products.
Ertz et al. (2017) Context: Canada	Consumers and providers of tangible goods	–	Gender, age, civil status, residential status, residential area	• Providing and consuming are governed by relatively similar hierarchies of motivation groups: (1) utilitarian (e.g., economy, pragmatism), (2) experiential (e.g., treasure hunting, stimulation, social contact, nostalgia, etc.), (3) protester (e.g., anti-commercialism), and (4) spiritual (e.g., ecology, ethics, morality, altruism). Differences between provider and consumer motivations are most apparent for utilitarian motives. Only economy is less important for providing than for consuming. • Women consumers and providers valued utilitarian and spiritual motives more than men, while male providers valued experiential motives more than women. Age differences were statistically significant for all considered motives across both roles. For example, those over 65 years were less motivated by all the included groups; except for spiritual motivations in providing. Spiritual motives were also significantly associated with civil status for both roles (for example, widows valued spiritual motives higher). Residential status was only significant for providers and spiritual motives.
Lindblom and Lindblom (2017) Context: Finland	–	–	Gender, age, employment status, education, income	• Intention to reduce ownership of products is evenly spread across the socio-demographic groups. Positive attitudes towards CC are much higher than intentions to use CC. • Age had the strongest effect on attitudes and intentions towards CC and towards reducing ownership. Younger groups had more positive

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Table 1 (*continued*)

Authors, research context	Analysis perspectives			Findings
	Roles	Products	Socio-demographic characteristics	
				attitudes towards CC than others. Regarding employment status, the groups that were the most positive towards CC were those on parental leave, whereas the retired, entrepreneurs, and unemployed had the least inclination towards CC. Students and entrepreneurs were most positive towards de-ownership. Female consumers had more positive attitudes and intentions towards CC, though gender had no impact on the intention to decrease ownership. De-ownership orientation and attitudes towards CC were positively associated with education level. Education also affected the intention to participate in CC, though with less significance. Income was only associated with positive attitudes towards CC.
Böcker and Meelen (2017) Context: Amsterdam, Netherlands	Consumers and providers	Mobility, accommodation, tools, and meals	Gender, age, ethnicity, education, income, household type	• Consumers prioritize economic benefits over providers, as renting leads to more savings. No significant differences were found between the consumers and providers regarding social and environmental motivations. Challenges for consumers include product quality variability, while providers have concerns over how consumers will treat their products. • Motivations for sharing tools vary between consumers and providers. Providers are most environmentally and socially motivated to share their tools, while consumers extract more financial benefits. A large portion of respondents are likely to use shared power drills, rides, and accommodation, but fewer are interested in sharing cars and meals. • Demographic characteristics have a lower effect on the motivations of people to share than products. Men and low or middle-educated groups are less environmentally motivated than their counterparts. Users under 40 years of age and low-income groups are more economically motivated than other groups. Older individuals are more socially motivated, regardless of income level, while higher-educated individuals and middle and higher-income groups are less socially driven to participate.
Hazée et al. (2019) Context: United States	–	–	–	• Contamination concerns in the SE become more important when accessing products that are close users' bodies
Eckhardt et al. (2019) Context: -	Peer-to-peer service providers, P2P consumers and providers	–	–	• Barriers apply to both consumers and providers, including mistrust of sharing and fear of contaminated products
Kim and Jin (2020) Context: University students in the United States	–	Tangible goods	–	• Consumers who are environmentally conscious, seek to reduce waste, desire to be part of a greater sharing community, and are price-conscious are more inclined to share tangible goods. • Consumers partake in sharing to access an abundant selection of products, as CC expands assortment choices. Further, consumers derive hedonic value and excitement from searching for and finding unique items through sharing. • Convenience, often recognized as a significant dimension in CC, was not significant in the context of tangible goods. Sharing of goods was perceived as inconvenient compared to services, possibly due to logistical issues in the search, delivery, and payment of used or rental goods.
Laurenti and Acuña (2020) Context: Students and employees in a Swedish university	Consumers and providers	Services (e.g., language classes), study materials (e.g., books, laptops), leisure items (e.g., clothes, sports equipment), tools (e.g., hammers, screwdriver), cars and food	–	• Providers and consumers are interested in the same assets, though in different proportions. Close to 80 % of consumers expressed interest in having access to services, 70 % wanted to access study materials, and both leisure items

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Table 1 (*continued*)

Authors, research context	Analysis perspectives			Findings
	Roles	Products	Socio-demographic characteristics	
				and tools were interesting for 65 % of respondents. Accommodation was interesting for 60 %, while car-sharing and food were interesting for less than half respondents. On the other hand, 65 % of providers were interested in sharing their services, 60 % wanted to share study materials, and 50 % wanted to share leisure items and tools. Services and study materials had the most significant number of reciprocal sharers (i.e. users intending to consume and provide). • Environmental sustainability, social benefits, perceived access to products, familiarity, and trust influence attitude positively, while perceived risk and expected effort influence attitude negatively. Financial benefits and risk of unavailability of products do not seem to influence attitude. Attitude, perception by social networks/reputation and perceived control influence use-intention positively.
Buda et al. (2020) Context: Hungary	–	Accommodation, transport, bike-sharing, and household products	Gender, age/generation, income, civil status, education, settlement type	• Age had the strongest impact among the examined factors. Baby Boomers (age 60+) were significantly less open, while the Y (age 26–39) and Z (14–25) generations were more open. Educational level significantly influenced openness, though the relationship was weaker than some other indicators. Those with post-secondary education were over-represented. The higher the income category of the respondent, the more open they were to SE services. • When combining socio-demographic characteristics, the group with most openness towards the SE were Generation Z people (age 14–25) with a high income and college education. The gender of respondents did not significantly influence openness towards shared services. • Openness to SE was overrepresented among active workers and students. In contrast, less than a fifth of retirees were open to sharing. Respondents having a minor child were also more open to sharing than other groups.
Jelinkova et al. (2021) Context: Czech Republic	–	–	Gender, age, education	• Most respondents perceive the SE's economic, social, and environmental benefits equally, with a few differences according to socio-demographic characteristics: Women, in comparison to men, perceive the environmental benefits of sharing as more important. The younger respondents, in comparison with the older, perceive as more important the efficient utilization of resources, simplification of the work–life balance, unusual experiences, and environmental protection. People with a higher education perceive efficient use of resources and financial savings as more important than people with a lower level of education.
Leland et al. (2023) Context: United States	–	Cars, bikes, accommodation, clothing, tools, and other household products	Age, income, race extraversion, education, political attitudes	• Respondent age was inversely related to sharing for all assets, though only marginally for clothing swaps. Younger individuals were more likely to use the SE, independently of self-reported extraversion, presence of children in the household, environmental beliefs, and political ideology. • There was no significant association between income and sharing in any category besides clothing swaps. • The presence of children in the household was positively associated with all categories of sharing except bicycle sharing.
Hansmann and Binder (2023)	Reciprocal sharers, unilateral sharers	Household products (e.g., kitchen equipment, tools), leisure (e.g., cameras,	Age, gender, country, education, income	• There were notable differences in the results between Switzerland and Sweden, which

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Table 1 (*continued*)

Authors, research context	Analysis perspectives			Findings
	Roles	Products	Socio-demographic characteristics	
Context: Sweden and Switzerland	(consumers and providers)	camping and sports equipment), and gardening equipment (e.g., lawn mower)		implies that cultural, economic, or contextual factors in these two countries influence how people engage in peer-to-peer sharing activities. • Nearly half of the participants were reciprocal sharers (both consumed and provided shared products), approx. 20 % exclusively consumed and 7 % exclusively provided. Reciprocal sharers had stronger ecological, social, and economic motivations, and rated the benefits of sharing higher than other groups. Positive emotions and knowledge of sharing processes were also positively correlated with consuming and providing shared products. • Some products had significantly more consumers than providers (e.g., drill, camping tent, ski gear), while for others, the numbers were roughly equal (e.g., camera, kitchen equipment). • Socio-demographic characteristics had an impact on which role the sharers engaged in. Reciprocal sharers were younger, with higher levels of income and education than other groups. Younger individuals also tended to be consumers and providers more often than older individuals, and the highly educated tended to be providers more often than those with primary education.

to more reciprocal sharing (Hansmann and Binder, 2023).

Gender often influences sharing orientations. In several studies, women had stronger attitudes and intentions towards the SE; and had deeper utilitarian, spiritual, and environmental motivations to share than men (Böcker and Meelen, 2017; Ertz et al., 2017; Jelinkova et al., 2021; Lindblom and Lindblom, 2017). Gender may also impact the preferred sharing modes, as Hansmann and Binder (2023) found that online sharing was more common for men. In other studies, though, gender did not have a significant effect on sharing orientations (Buda et al., 2020).

As for income levels, higher income groups had significantly more plans to use sharing than other income groups (Buda et al., 2020; Lindblom and Lindblom, 2017). Higher incomes were also prevalent in reciprocal sharing and online sharing (Hansmann and Binder, 2023). Consumers with low income were more economically motivated than other groups; while middle and higher-income groups were less socially driven to participate (Böcker and Meelen, 2017). Leland et al. (2023), however, found that income was largely unrelated to most sharing modes. Cultural, economic and contextual factors may contribute to the variation of these results (Hansmann and Binder, 2023). Therefore, the research context is included for each study in Table 1.

2.3. Governance of the sharing economy

Governance helps define and achieve collective goals through the participation of public and private actors, and is often essential for achieving sustainability goals (Voytenko Palgan et al., 2021). As the effects of the SE are uncertain, various authors propose that governance of the SE is essential for leveraging its positive sustainability effects (Bernardi and Diamantini, 2018; Ma et al., 2018; Muñoz and Cohen, 2017) and consider that the SE currently lacks the necessary policy and regulation to function appropriately (Cheng, 2016; Hossain, 2020; Leung et al., 2019). Urban governance is highlighted, as cities are considered essential hubs for sharing and municipalities could be more responsive to these local processes than national governments (Henry et al., 2021; Hong and Lee, 2018). Knowledge about governance approaches and mechanisms can feed the discussion on how sharing may be addressed by municipalities.

2.3.1. Governance approaches

Several governance approaches emerge from the literature. Mont et al. (2020) distinguish between proactive and reactive governance, while Voytenko Palgan et al. (2021) differentiate between top-down (a controlling approach) and bottom-up methods (empowering sharing initiatives(SIs) self-governance). Bridging these is collaborative governance, where multiple stakeholders engage to attain shared objectives (e.g., governments collaborating with SIs to address the employment status of providers) (Leung et al., 2019; Ma et al., 2018; Vith et al., 2019). Within climate governance there's the orchestration approach, where orchestrators do not govern targets directly, but work through intermediaries with similar climate goals. Intermediaries influence targets to align with the orchestrator's goals through financial, technical, and reputational incentives. While multiple actors at different scales can be involved in orchestration, it is often intergovernmental bodies (e.g., the UN) acting as orchestrators, subnational and private organizations (e.g., non-governmental organizations) acting as intermediaries, and national and local governments (e.g., municipalities) being the targets (Abbott, 2017; Abbott et al., 2015). In this way, municipal governance actions might be the result of orchestration approaches.

2.3.2. Sharing economy governance mechanisms

Researchers have explored sustainability governance literature and conducted empirical investigations to detail governance mechanisms for the SE. Among the identified mechanisms is "regulation", rooted in traditional authority forms, which allows municipalities to either promote or control SE operations (Voytenko Palgan et al., 2021). Regulation is a recurrent theme in SE studies (Barile et al., 2021), addressing concerns like legal loopholes, and geographical delimitation of SIs (Vith et al., 2019). "Provision" involves cities offering or withdrawing services, financial support, material, and infrastructural means to SIs. Infrastructure, particularly, is crucial is for fostering sustainable sharing cities (Agyeman, 2013; Barile et al., 2021). "Enabling" consists of

municipalities encouraging actions through partnerships, subsidies and community connections (Barile et al., 2021; Voytenko Palgan et al., 2021). In the "collaborating" mechanism, municipalities partner with SIs through equal relationships, which is an important element in the governance of complex urban sustainability challenges (Mccormick and Leire, 2020; Palm et al., 2019; Voytenko Palgan et al., 2021). Other mechanisms include "fostering", which involves making niche behaviors (such as unpopular sharing forms) more appealing to the general population; and "measuring", which pertains to quantifying aspects of the SE, such as consumption (Mccormick and Leire, 2020).

Governance mechanisms might be employed in different ways according to the overarching governance approaches. For instance, the "regulation" of the SE might be proactive or reactive; while the "provision" mechanism might correspond to a top-down approach when withdrawing resources, or to a bottom-up approach when providing support to SIs. Other mechanisms might fit more clearly into certain approaches; for example, the "collaborating" mechanism corresponds to a collaborative approach, and the "enabling" mechanism could be akin to orchestration approaches.

3. Methods

This section presents the different steps undertaken during the study. We utilized data from two web-based surveys: one conducted by the authors (academia), and one conducted by the Municipality. Section 3.1 describes the main features of our collaboration with Gothenburg Municipality, and details for each survey are explained in the Section 3.2 "Survey design and data collection". The research objectives were addressed by extracting a subset of variables from each survey according to two dimensions: variables that depict consumption, and variables that depict sharing. The rationale behind the dimensions, and the selection process, are shown in Section 3.3 "Scope and variable selection for the study". Finally, Section 3.4 "Data treatment and analysis" describes the data preparation for analyses and the statistical procedures used to arrive at the highlighted product and demographic patterns.

3.1. Collaboration with Gothenburg Municipality

Gothenburg Municipality participated in the national program Sharing Cities Sweden (SCS) (2021a), through their Sharing Cities Gothenburg (SCG) (2021b) testbed. The SCG testbed investigated and promoted the role of the SE in achieving sustainable cities from 2018 to 2021. In parallel, the project "Sharing Economy Sustainability Assessment Method" (SEsam) was carried out at the university by the authors with the objective of supporting the implementation of SE initiatives at a neighborhood level. The common interest of enabling the SE as a sustainable practice resulted in the collaboration between the authors and Gothenburg Municipality (i.e., representatives from the SCG testbed). The main features of the collaboration were i) mutual feedback during the design phase of the two surveys (further explained below); ii) exchange of survey data; and a workshop which resulted in, iii) the elaboration of the ROs addressed in this study; and iv) joint selection of the variables to be analyzed from each survey (also explained below).

3.2. Survey design and data collection

Data were collected from two independent, web-based, cross-sectional questionnaire surveys. For the variables considered in this paper, the sample consisted of 364 responses in the SEsam survey and 961 responses in the SCG survey. The two surveys had independent purposes and major differences in the sampling strategy; but the survey type, delivery form, and geographical coverage were equal, and the data collection period, target demographic, independent and dependent variables, as well as activities and products covered in the scope were largely overlapping and therefore comparable (see Appendix B – Table B.1 for detail). Furthermore, the respondent demographics for the two surveys were similar. As for ethical concerns of the data, respondents were not aware of the cross-use of data, but both surveys were handled confidentially and collected no personal data that could be used to identify respondents. SEsam respondents were further informed that their responses would be used for research purposes (see consent statements in Appendix A – Tables A.1 and A.2).

3.2.1. Sharing Cities Gothenburg Survey

In the SCG testbed, the Municipality designed the survey to "increase the understanding and knowledge of households in Gothenburg and their recognition, attitudes, and participation in the local SE" (Institutet för kvalitetsindikatorer AB, 2021). The SCG survey served as follow-up to a similar survey conducted in Gothenburg in 2017 and was compatible to similar surveys carried by SCS in two other Swedish cities Karlstad and Malmö (Barkman and Wedberg, 2021; Malmö Innovationsarena, 2016). By that, the surveys contributed to increasing the understanding of SE attitudes and practices throughout Sweden.

During the design phase, feedback was provided by SCG partners and university researchers including the authors, as means of obtaining face and content validity of the survey instrument. The final questionnaire measured behaviors, such as utilization of products in the household and of sharing services; and attitudes towards sharing activities, which resulted in 14 questions and 103 variables. Substantive data measured both individual and household attributes. A full copy of the questionnaire can be found in Appendix 1 – Table A.2.

The SCG survey was distributed to 2800 people during the spring of 2021 by the Institute of Quality Indicators. A stratified sampling approach was used to randomly select 700 people registered in each of Gothenburg's four urban areas. Respondents were initially reached by mail and directed to a self-administered web-survey. The online format was necessary given that the survey was conducted during the COVID-19 pandemic. The overall response rate for the survey was approximately 34.3 % (n = 961). Full sampling details can be found in the survey's technical report (Institutet för kvalitetsindikatorer AB, 2021).

The survey's topic opened the door for social desirability bias in the collected data. Respondents may have felt societal pressure as to what the "right" answer is, causing them to underestimate their consumption, overstate their previous levels of engagement with SE, or overstate their interest in SE activities. It is possible that the web-based format could have helped reduce social desirability bias by providing a greater sense of anonymity to the respondents, though evidence on this is mixed (Jones et al., 2016). At a minimum, it can be said that the format of the survey did not encourage higher levels of social desirability bias. Additionally, like in all surveys, there was a chance of nonresponse/self-selection bias, which could lead to individuals who are more interested/engaged in the SE to be more likely to take the survey. In this case, levels of participation and interest would be overestimated. Notably, in the data we found overall low levels of previous or desired future engagement with SE activities and low beliefs that people own too much (see Section 4). This provides some assurance that social desirability and nonresponse bias, while possibly still present, were likely not the driving force behind our results.

3.2.2. SEsam survey

The SEsam survey was distributed online via social media within a 3-week period during the Spring of 2021. The questionnaire was intended to measure consumption behaviors of shareable products, and product-sharing behaviors and attitudes. The survey was also designed to be compatible with the Swedish Household Budget Survey (HBS), and therefore the products covered in the survey corresponded to the Classification of Individual Consumption According to Purpose (COICOP) nomenclature (Statistiska Centralbyrån, 2013). Sixty-six product types were included in the study, within the products groups of adult and children clothing and accessories; furniture and household equipment; transport; and leisure and sports equipment. In the main section of the survey, respondents indicated how many items of each product had been

purchased in the household during the past year, and how many were already in the household. Approximately 40 % of SEsam respondents agreed to take the optional section of the survey, where they were asked about their willingness to share these products, either from a provider or consumer role. This resulted in 22 questions and 154 variables, excluding questions about socio-economic characteristics. Following the survey methodology of Blair et al. (2013), a draft survey was distributed to university students in a pre-test stage. Feedback from survey distributors, respondents, and SCG representatives regarding the face and content validity of the survey instrument influenced modifications to the original questionnaire, among them reducing the length of the questionnaire and eliminating non-critical elements in the sharing section.

We utilized a non-probability, convenience sampling scheme with a quota on (I) type of dwelling, (II) presence of children in the household, and (III) urban area where the household was located. This resulted in 363 responses from a target population compatible with the HBS (Statistiska Centralbyrån, 2013) (see Target population in Appendix B – Table B.1).[1] The quota did not include an income parameter due to expected income and employment instability during the collection period, which coincided with the COVID-19 pandemic (Angelov and Waldenström, 2021; Jämställdnetsmyndigheten, 2021). The quota was set based on household composition data in 2017 requested from Gothenburg Statistics Database (2022) and Statistics Sweden (2022). Social media was utilized to reach the target population due to practicality and COVID-19 restrictions. A link to the questionnaire was distributed and shared in personal Facebook accounts, but also in Facebook neighborhood groups across Gothenburg.

While the SEsam data shares sources of bias with the SCG data (social desirability, non-response/self-selection), there is an additional risk of sampling bias due to deploying the survey on social media. If users of social media are in some way markedly different than non-social media users, results from this dataset could be biased. In Sweden, there is a high degree of digitalization, and in 2021 70 % of the population were Facebook users. Although the proportion of users decreases as age increases, over 50 % of Swedes above 65 years old use Facebook (Internetstiftelsen, 2021). It is important to note that while the quota helps balance the sample on the three variables defining the quota, there is still possible bias due to the survey only being available on social media.

3.2.3. Combining information from both surveys

While statistical methodologies for combining data from independent surveys to be analyzed simultaneously exist, these approaches require either the ability to link observations between surveys or the utilization of a statistical model for imputations (Kim and Rao, 2012). We were unable to directly link observations between the two surveys, and given the non-probability sampling method and small sample size of the SEsam survey, we chose not to use a method that adds another layer of uncertainty via an intermediary statistical model. Instead, we elected to analyze the two datasets independently. Since both surveys contain information about the same population in the same period, we leverage the strengths of each survey to compose a more complete picture of consumption and sharing in Gothenburg.

3.3. Scope and variable selection for the study

The scope was limited to tangible products excluding transportation and food. All socio-economic characteristics originally in the surveys were considered, except for geographic location, dwelling size, and level of trust. By this, the scope of the study was refined to include 60 product types out of the 66 in the SEsam survey, and 7 socio-economic characteristics out of the 10 collected in both studies combined. A complete list of the products and socio-economic categories within the scope of the study can be seen in the Appendix D – Tables D.1 and D.2. A wide scope was maintained in terms of SE activities (see Section 2.2.1). Examples of SE activities can be seen in Appendix B – Table B.1.

During the collaboration, the Municipality expressed difficulty in interpreting extensive amounts of data to arrive at actionable items. A clear example is seen in this study, where the two surveys amounted to over 250 variables. The authors therefore proposed two dimensions, a) consumption and b) sharing, that helped select which variables in the data sets would provide insights into the ROs. We considered the consumption and sharing dimensions concomitantly, as the SE can only contribute to sustainability if consumption is reduced and sharing is increased. We assumed that the dimensions aided in achieving dematerialization in the following ways:

3.3.1. Consumption

In the consumption dimension, we could see the product types (RO1) or demographic groups (RO2) for which a high consumption of new products was reported; for which a perception of owning too many products was reported; and demographic groups (RO2) that were interested in reducing their consumption. An example of how these variables interplay is the following: For RO2, addressing the groups that most consume can aid dematerialization (high consumption), if they consider that their consumption needs are covered (own too much) and they are also willing to reduce said consumption (high willingness to reduce consumption).

3.3.2. Sharing

In the sharing dimension, we could see the product types (RO1) or demographic groups (RO2) for which a high interest and/or participation rate was reported; that is, groups or products for which high engagement was likely. On the other hand, groups who expressed a positive attitude towards participating in the SE, but showed low rates of actual participation, could also contribute to dematerialization if prompted to share more.

Next, the authors and SCG representatives selected the variables that aligned with the dimensions in each RO (see Table 2). The selection also aimed to include variables depicting both attitudes and behaviors. As can be seen, some variables were used to respond to both ROs. That is because, for RO1, the variables were analyzed in function of the product group they addressed (clothes, kitchen equipment, furniture and decoration, children's articles, tools, electronics, and leisure equipment), while for RO2, they were analyzed in function of the socio-economic characteristics of respondents (age, gender, education level, dwelling type, number of children/adults and disposable income).

3.4. Data treatment and analysis

Post-stratification weights were computed for each sample after data collection, as a means of improving the precision of estimates, by correcting over or under-representation of relevant demographic groups (Holt and Smith, 1979). For the SEsam survey, post-stratification was conducted for the parameters of type of dwelling and presence of children in the household using household composition data in Gothenburg (Göteborgs Stad Statistik och Analys, 2022; Statistics Sweden, 2022). Other household-related variables in the available statistics were not included in the post-stratification due to uncertainty during the COVID-19 pandemic. For the SCG survey, a representativity study was conducted on the survey sample by using population data from Statistics Sweden (2022). Groups that were under- and overrepresented were identified and the results were weighted in accordance (Öhrwall, 2021).

During pre-analysis, many variables were transformed to isolate the most relevant information, facilitate interpretation of results, or to help combat hypothetical biases (Johansson-Stenman and Svedsäter, 2012). This applied to RO2 variables "Attitude towards own product stock", "Consumption during past year", "Attitude towards reducing consumption" and "Attitude towards sharing activities". For example, in the

[1] The use of a convenience sample prevents us from reporting a response rate for the SEsam survey.

Table 2
Mapping data to ROs. The table displays the survey questions selected to respond to the ROs, the dimension to which they belong, the resulting variable name, the type of variable, and the analyses performed.

RO	Dimension	Survey question	Survey	Variable name	Type of variable	Types of analyses
RO1: Product group perspective	Consumption	How many of the [following] products did your household buy in the last year?	SEsam survey	Consumption during past year	Interval	Descriptive statistics
		In which product groups do you own too many items that you do not use?	SCG survey	Attitude towards own product stock	Ordinal	Descriptive statistics
	Sharing	Which product types are already obtained by the household through sharing initiatives (SIs)?	SEsam survey	Product sharing behavior – Consumer/user	Open answers (transformed to discrete values)	Qualitative coding Descriptive statistics
		Which product types are already provided by the household through sharing initiatives (SIs)?	SEsam survey	Product sharing behavior - Provider	Open answers (transformed to discrete values)	Qualitative coding Descriptive statistics
		Which product types would the household like to obtain through sharing initiatives (SIs)?	SEsam survey	Interest towards product sharing – Consumer/user	Open answers (transformed to discrete values)	Qualitative coding Descriptive statistics
		Which product types would the household like to provide through sharing initiatives (SIs)?	SEsam survey	Interest towards product sharing – Provider	Open answers (transformed to discrete values)	Qualitative coding Descriptive statistics
RO2: Demographic group perspective	Consumption	In general, do you consider that you own too many things or too few?	SCG survey	Attitude towards own product stock	Ordinal (transformed to binary)	Descriptive statistics Logistic regression
		How many of the [following] products did your household buy in the last year?	SEsam survey	Consumption during past year	Interval (transformed to binary)	Descriptive statistics Linear regression
		What is your spontaneous opinion about reducing your consumption in the following five years?	SCG survey	Attitude towards reducing consumption	Ordinal (transformed to binary)	Descriptive statistics Logistic regression
	Sharing	What is your spontaneous opinion about the [following] SE activities?	SCG survey	Attitude towards sharing activities	Ordinal (transformed to binary)	Descriptive statistics Linear regression (zero-inflated Poisson model)
		Are there product types that the household would like to obtain/provide through sharing initiatives (SIs)?	SEsam survey	Interest in product sharing	Binary	Descriptive statistics Logistic regression
		Are there product types that the household already obtains/provides through sharing initiatives (SIs)?	SEsam survey	Product sharing behavior	Binary	Descriptive statistics Logistic Regression Difference of Proportions Tests

variable "Attitude towards own product stock", respondents could indicate that they owned "too many", "an appropriate number", or "too few" things. Here, we created an indicator variable for the answer "too many" to identify individuals/products that are candidates for reduced consumption. For the variable "Consumption during the past year", values were calculated both per household and per person in the household. Then, the interval categories were transformed into a binary variable (i.e., "very high consumption" vs. "not very high consumption"), where a very high consumption is described as 51 or more products per person.

Another measure to reduce the output of results was the aggregation of similar variables into one; this applied to RO1 variables "Consumption during past year" and "Attitude towards sharing activities". For example, in "Attitude towards sharing activities", we originally had 8 variables corresponding to different sharing activities, and for each one the participants could respond that they felt "very positive", "quite positive", "quite negative", and "very negative". We first created 8 binary variables that took on the value one (1) if the answer to the questions was "very positive". Then, we defined our final variable as the sum of the 8 binary variables, resulting in a variable that counted for how many of the activities the respondent answered "very positive". Additionally, all variables considered in the sharing dimension for RO1 were originally open-ended questions. Qualitative coding was performed for each response, to arrive at a count for each product group, thus becoming a discrete numeric variable (Miles et al., 2019).

Moving on to analysis, each variable in Table 2 was studied through descriptive statistics. For the product groups, the analysis was based on descriptive statistics results. For the demographic groups, descriptive statistics were the first step, and then ordinal, logistic, and linear regressions were performed according to the variable type and data availability (Hellevik, 2009). These analyses indicated which socio-economic characteristics were statistically significant (with $p < 0,5$; 0,01 and 0,001).

It should be noted that due to the independent survey designs, the age and income categories could not be normalized across surveys, thus we present these results separately. Product groups, on the other hand, were easily normalized following assumptions of the researchers. The 60 product types in the SEsam survey could be aggregated into 7 product groups matching the SCG survey categorization (see Appendix D – Table D.1).

4. Results

4.1. What patterns can be seen in the consumption and sharing of different product groups?

This section addresses RO1. The main takeaways are presented first, followed by detailed results for each variable. A summary of the outcomes considered can be found in Fig. 1.

4.1.1. Highlights

In general, the product group with the highest reported consumption (items/year), and that people believed they owned too much of, was clothes. However, our results suggest that respondents might not substitute such consumption in the future by accessing clothes through the SE – as neither the levels of interest (6 %) nor current participation (5 %) from the consumer role were very high. However, 18 % of respondents stated that they were already providing clothes through the SE, and 15 % had an interest in doing so in the future. In practice, this could translate into the population maintaining a high level of consumption, but then donating or selling the clothes when no longer necessary. On the other hand, as seen in Fig. 1, tools (most commonly for gardening) and leisure equipment (most commonly for sports and outdoor activities) were the product groups with the highest interest and participation

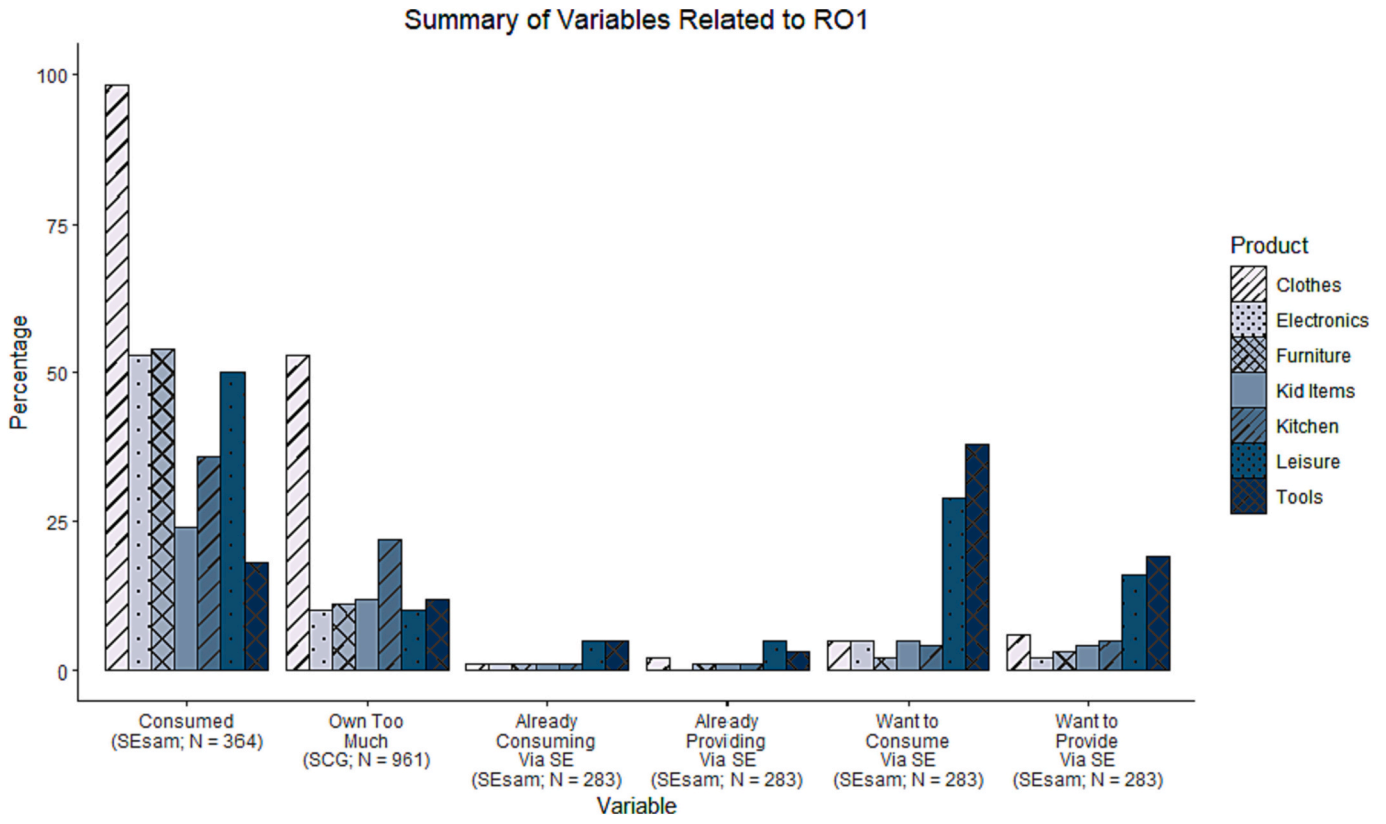

Fig. 1. Summary of results for RO1. Note the mixture of variables from the SEsam and SCG datasets and the changing sample sizes. The bar chart depicts the product groups of clothes [12 product types], electronics [11 product types], furniture and decoration [5 product types], children's articles [11 product types], kitchen items [8 product types], leisure equipment [10 product types] and tools [3 product types].

in sharing, but the levels of consumption and belief that they own too much is low for these product groups. A similar hotspot was seen for kitchen equipment – including items that were not bought in large amounts, but which people believed that they owned too much and were willing to or already engaged in sharing. A polarity is observed for these product groups (high values in the consumption dimension combined with low values in the sharing dimension, or vice versa), so with the current data, it was not possible to highlight products that could contribute to a significant reduction in yearly consumption substituted by future sharing. On the other hand, there is clearly more potential of sharing for products that are consumed in lesser amounts yearly.

Furthermore, Fig. 3 suggests that there might be attitude-behavior gaps related to sharing. This is evidenced by the total samples for each variable, as bigger samples are perceived for wanting to consume and wanting to provide (211 and 116, respectively) than to already engage in these activities (62 and 38 respectively). Notably, the gaps are not present for all product groups. The most significant gaps exist for leisure equipment (15 % more interest than participation for the consumer role and 6 % more for the provider role) and for tools (20 % more interest for the consumer role, and 23 % more interest for the provider role), while very small differences are seen for the other product groups.

For the observations above, it is important to note that there is a potential for self-selection bias and that some of these findings are based on very small samples. Nonetheless, the variance in the attitude-behavior gaps supports the simultaneous analysis of several products.

4.1.2. Detailed results

In the variable "Consumption during past year", respondents could indicate the number of items that they purchased during the last year within each product group. Amounts were indicated by ranges (e.g., "41–50 items"), therefore an approximation of the total purchases was calculated by assuming the middle value of the ranges. We saw the greatest variability in the amount of clothes and children's items (see Fig. 2 - Left).

In the variable "Attitude towards own product stock", respondents could indicate all products groups where they owned too many things that they did not use often. Most commonly, respondents selected only one product group (36 %), followed by no products (27 %). Only 0,6 % of the population believed they owned too many products within all groups listed. The number of responses per product group is shown in the bar chart below (Fig. 2 - Right). We see that, by far, clothes were the most frequently chosen group. Note that this question was only presented to respondents who previously answered that they owned too many things (see RO2). Therefore, those who responded "no products" might mean that they think they own too many things but do use them, or that the product categories that they refer to are not included in the survey.

As for "Product sharing behavior" and "Interest in sharing", respondents could answer in an open-text form which products they wanted to share and/or already shared, whether as a provider or consumer. Fairly consistent results were seen across product groups. Fig. 3 shows that leisure equipment and tools were the most mentioned product groups, in both variables and for both sharing roles. While it was most common to mention general product groups (e.g., "tools"), some specific product types stood out. For example, gardening tools were, by far, the most mentioned in the tools group. Some other examples in the same group were electrical tools (drill, water-pressure cleaner), saw, screwdrivers and "bigger" tools. In the leisure equipment group, commonly mentioned types were winter sports-, outdoors- and fishing equipment. An interesting case in the leisure equipment was books, which were most mentioned in current access, and in wanting to provide or already providing, but not in wanting to access. This could mean that the interest in accessing books is already well satisfied by libraries and second-hand shops.

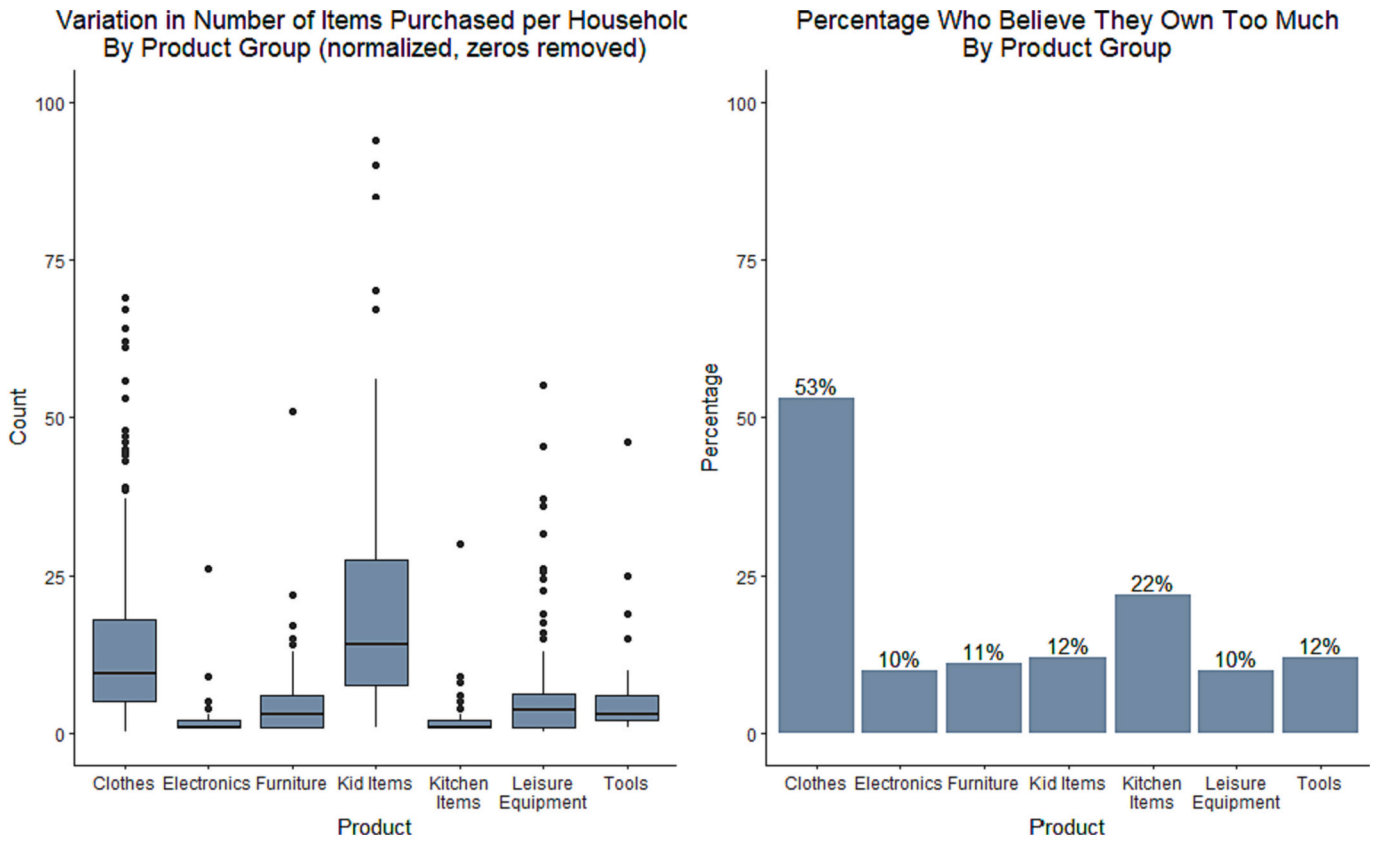

Fig. 2. The side-by-side boxplots (left) show the variation in consumption of the various product groups using SEsam data. The bar chart (right) shows the percentage of respondents who believed they owned too much of each category using SCG data. The figures depict the product groups of clothes [12 product types], electronics [11 product types], furniture and decoration [5 product types], children's articles [11 product types], kitchen items [8 product types], leisure equipment [10 product types] and tools [3 product types].

The levels of current and desired participation in both consuming and providing roles are approximately the same for clothes, electronics, furniture, children's items, and kitchen items. For leisure equipment, we see higher levels of desired participation than current participation in the consumer role only. For tools, we see a higher desired participation than current participation in both roles. When looking only at desired participation, we see a higher interest in being a provider than a consumer for clothes, furniture and kitchen equipment.

4.2. What patterns can be seen in the consumption and sharing of different demographic groups?

This section addresses RO2. The main takeaways are presented first, followed by detailed results for each variable. For the regression results, a demographic group has been taken as a baseline for each demographic characteristic, so all results must be taken as a comparison between the mentioned group and the baseline group (e.g., men in comparison to women). The full results for the statistical analyses be seen in Appendix E.

4.2.1. Highlights

Results are summarized in effects plots in Figs. 4 and 5. Our results suggest that men are less interested in dematerialization through sharing than women, because they were less likely to believe that they owned too much, to have a "very positive" attitude towards reducing their consumption, and to be "very interested" in sharing activities (irrespective of the type). Another group of interest were respondents aged 65 or older, who did not report very high consumption in comparison to the youth group, but believed that they owned too many products, suggesting that these products exist within their personal stock. Further, in the SEsam data, this group had moderate significance for not acting as providers in the sharing of products, and in the SCG survey, they were highly unlikely to be "very positive" towards sharing activities. Respondents in the middle age category show a similar profile, except that they do not believe they own too much compared to respondents in the youth category. Results suggested that the only group with potential for dematerialization through sharing were respondents with post-secondary education. These respondents believed that they owned too much and were the only group with a very positive attitude towards all sharing activities, though the potential for amounts of dematerialization is lower as no remarkable values were seen for their yearly consumption.

An aspect that stood out from the results is that individual characteristics had more relevance than household characteristics. Specific categories within the age, gender, and education attributes displayed high or very high statistical significance, but for household attributes, significance tended to be moderate (except for the relationships between house-dwellers and product consumption; and having one child and temporary-exchange activities). Another aspect to consider is that the highest levels of significance only emerged as negative associations as in the case for men.

4.2.2. Detailed results

We begin by looking at the variables related to consumption. Regression results are seen for outcome variables regarding levels and attitudes towards consumption (Fig. 4 – Top and Fig. 4 – Bottom, respectively). About 30 % of respondents were classified as having a very high consumption/household (over 51 products during the year). We find evidence that as age increases levels of consumption decrease ($p < 0.01$ Age 45–64; $p < 0.001$ Age65+); however, we do not find evidence that consumption levels differ between those younger than 25 and

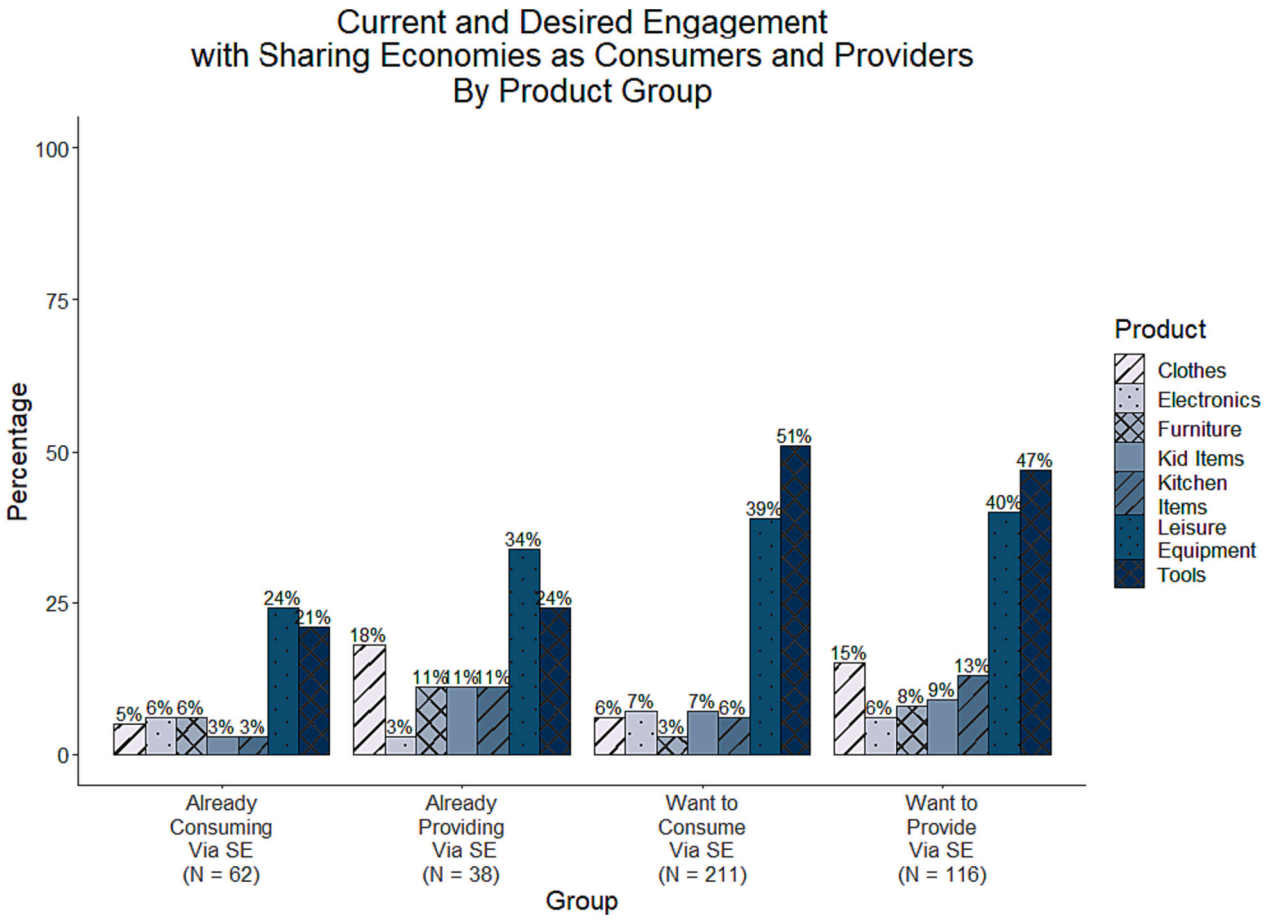

Fig. 3. Bar chart comparing the variables in the Sesam survey related to sharing in RO1. Note that the sample sizes differ in base of the number of respondents who submitted an answer for each variable. The bar chart depicts the product groups of clothes [12 product types], electronics [11 product types], furniture and decoration [5 product types], children's articles [11 product types], kitchen items [8 product types], leisure equipment [10 product types] and tools [3 product types].

those between 25 and 44. We also find moderate evidence that those who live in houses consume less than those who live in apartments ($p < 0.01$) and those in the highest income bracket consume more than those in the lowest income bracket ($p < 0.05$). Note that respondent gender was not available in the SEsam survey and therefore not included in the regressions.

Turning to the variable "Attitude towards own product stock", 34 % of the sample thought that they owned too many things. We find that individuals who are 65+ ($p < 0.05$) and those with at least a high school education ($p < 0.05$) are more likely to believe they have too much. We also find strong evidence that men, in comparison to women, are less likely to think they own too much ($p < 0.001$). Finally, looking at the outcome "Attitude towards reducing consumption", only 33 % of the respondents felt very positive about reducing their consumption. We find strong evidence that men are less likely than women to want to reduce their stock ($p < 0.001$) and moderate evidence that house dwellers are less likely to want to reduce than apartment dwellers ($p < 0.05$).

Next, we consider how respondents feel about different types of sharing activities. General results show that only 5 % of the population was very positive towards all SE activities while the percentage is 7 % when only considering temporary-exchange activities. To further analyze this, we fit zero-inflated Poisson models to our over dispersed count data. The results can be seen in Fig. 5 - Top. When we look at all sharing activities, we find that as age increases, the average count of "Very Positive" answers towards activities decreases ($p < 0.05,0.01,0.001$ respectively); men have a lower count than women on average ($p < 0.001$), and compared to single-adult households, two-adult households have a higher expected count ($p < 0.05$). We also find that those with post-secondary education, compared to those with primary education, have a higher count on average ($p < 0.01$). Looking at only temporary activities, we see very similar results except we do not find evidence that the age group 30–49 differs from those younger than 30 nor do we see a significant effect for education. We do find evidence that those with one child have a higher average count that those with no children ($p < 0.01$).

Lastly, we look at our analysis of current and desired engagement with SE initiatives. The output of the four logistic regression models can be seen in Fig. 5 - Bottom. We find that those in the 65+ age category are less like to already be a provider in SE than those younger than 25 ($p < 0.05$). We also find that households with a single child are less likely to want to engage with SE in the future, either as a provider ($p < 0.05$) or consumer ($p < 0.05$).

5. Discussion

In this study, we have investigated potential pathways for dematerialization, conceptualized as increased sharing and reduced household consumption, as a means to facilitate proactive local governance towards a sustainable SE. The analysis of 12 dependent variables allowed a deeper understanding of the attitudes and behaviors related to each product and demographic group. The insights from the SCG survey apply specifically to Gothenburg and could apply to other Swedish and international municipalities with similar cultural, socio-economic, and

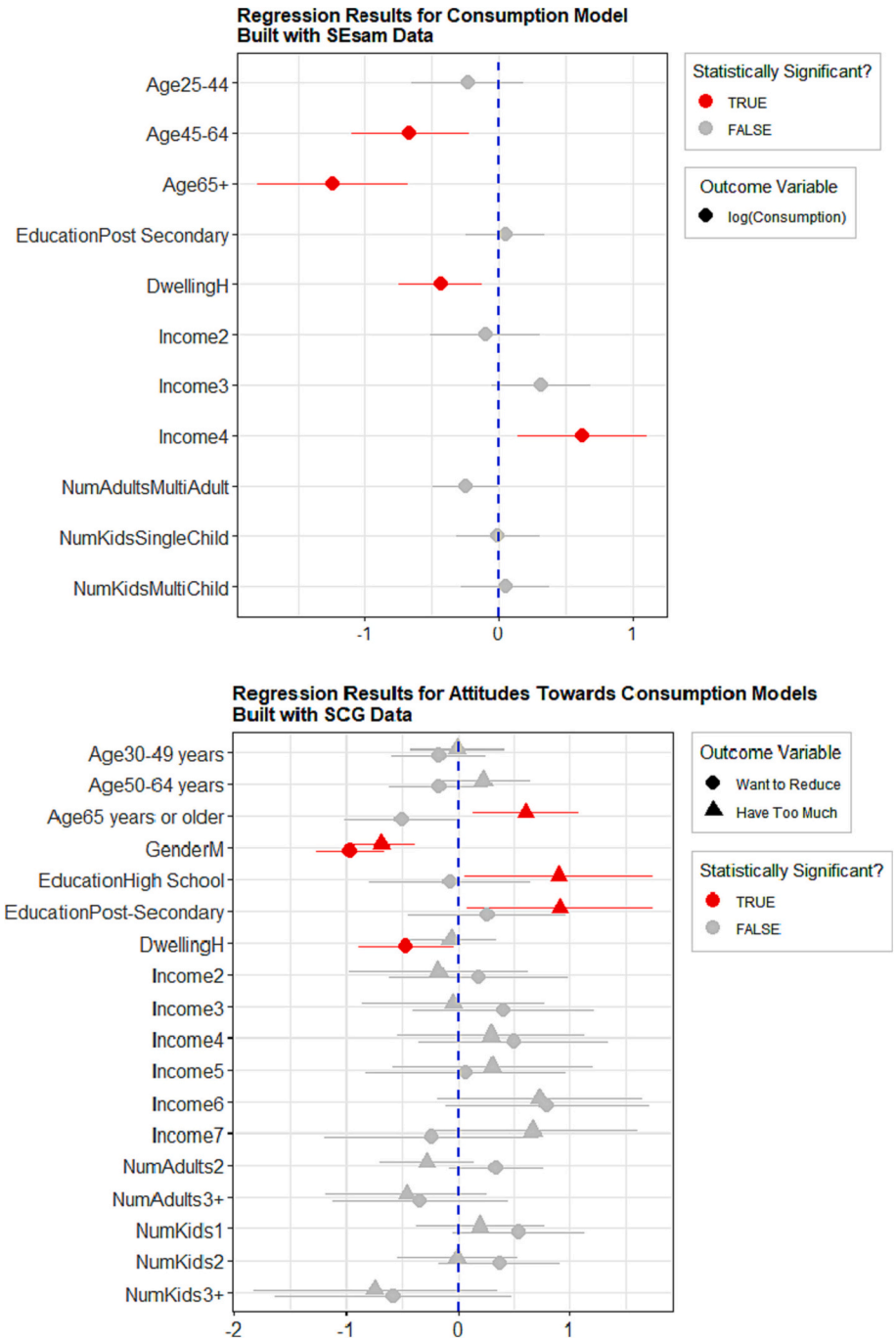

Fig. 4. Top: Regression results for the SEsam outcomes variables associated with product consumption during past year. N = 188–271 depending on outcome variable. Bottom: Regression results for SCG outcomes variables associated with attitudes towards own product stock and towards reducing consumption. N = 802–829 depending on outcome variable. Each symbol represents a different outcome, the location of the symbol is the point estimate of the coefficient, and the bars represent the 95 % confidence interval of the estimate. Symbols and bars in red are statistically significant at an $\alpha = 0.05$ level. Note that log (Consumption) is a continuous outcome while the others are binary.

demographic characteristics, though further research should support this notion; while insights from the SEsam survey apply to the surveyed population and serve as inspiration for further research. International applicability can be presumed for findings congruent with extant literature (e.g., lower interest in accessing clothes through sharing, attitude-behavior gaps related to sharing, and gender differences in sustainability attitudes and behaviors).

To our knowledge, no other scientific article within the user perspective literature has covered such a wide scope of tangible products, socio-demographic characteristics, sharing activities, and user roles. Our wide scope goes against the fragmentation currently dominating the SE research field and contributes to the scarce knowledge on the user perspective of sharing household products, and on the potential of reducing consumption through sharing.

In terms of methodology, we perceived an advantage to having utilized the consumption and sharing dimensions to organize the variables. This development could help stakeholders such as the Municipality to select variables tailored to their sustainability goals. For example, different dimensions could be used for addressing social sustainability, an important instrument in the SE (Moon, 2017). Considering potential

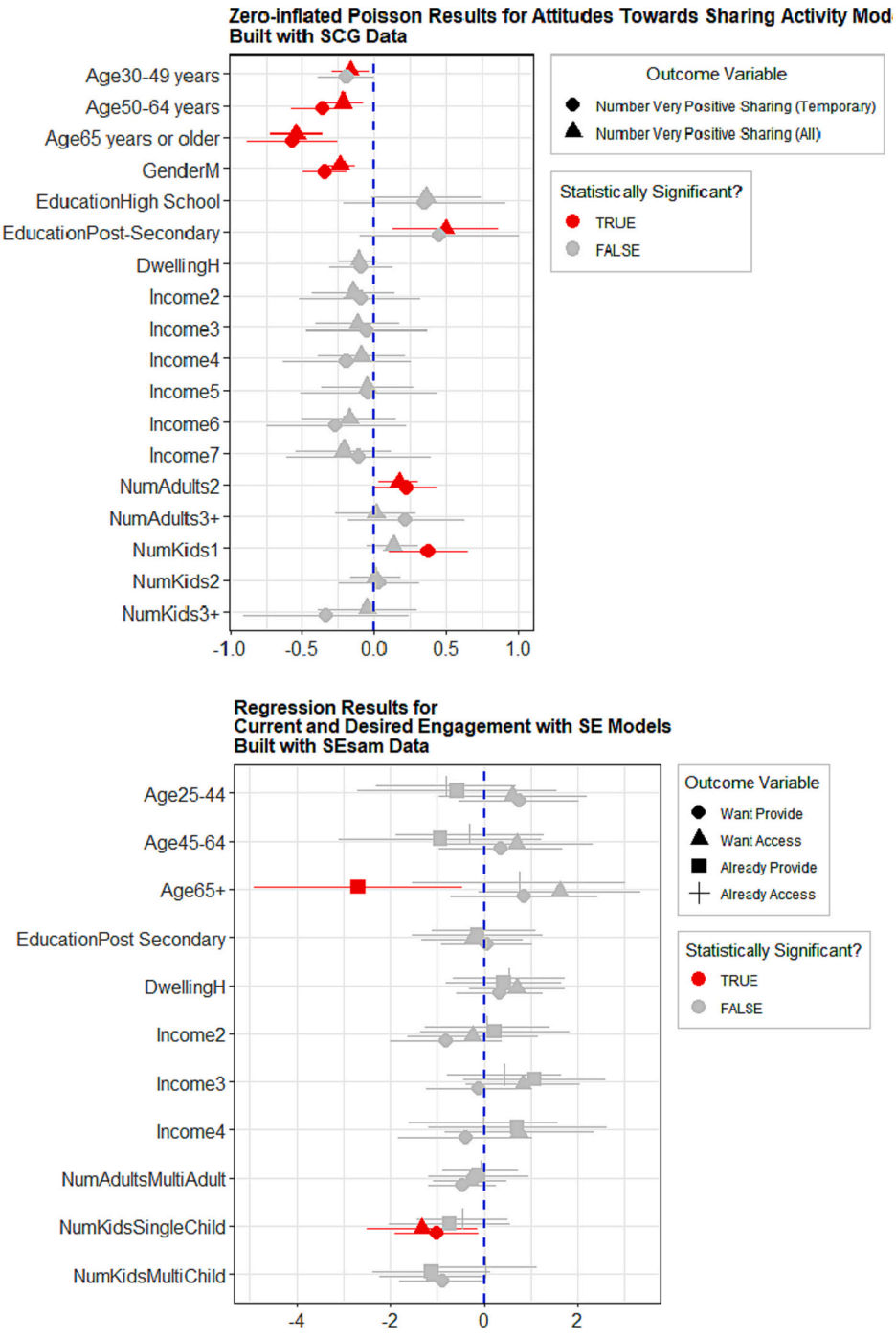

Fig. 5. Top: Regression results for SCG outcomes related to attitude towards sharing activities. N = 829 depending on outcome variable. Bottom: Logistic regression results for outcomes regarding current and desired engagement with SE. N = 188–211 depending on outcome variable. Each symbol represents a different outcome, the location of the symbol is the point estimate of the coefficient, and the bars represent the 95 % confidence interval of the estimate. Symbols and bars in red are statistically significant at an $\alpha = 0.05$ level.

budget restrictions for the elaboration of new surveys, this approach can be used by the Municipality in the future to complement the data they already own. Furthermore, the collaboration between local government and academia ensured that the needs and goals of the authorities were addressed directly. Until now, much of the collaborative research has focused on the business perspective, so their results are not necessarily aligned with environmental goals (Buldeo Rai et al., 2021; Lutz and Newlands, 2018; Sands et al., 2020).

5.1. *Product patterns*

In the results, we observed a polarity between the consumption and sharing dimensions – products with high consumption values had a lower appeal for sharing and vice-versa. For the clothes product group, the higher interest in providing than in consuming through the SE might be explained by a need to address large stocks of clothes in the households (clothes were among the highest purchases during the year, and over 50 % responded that they owned too many). Although these results

originated from a low number of samples in the SEsam survey, a high yearly consumption of clothes implies that consumers wish to renew their wardrobe with regularity, and hygiene concerns when accessing clothes in SIs might make purchasing the most attractive option (Becker-Leifhold and Iran, 2018; Hazée et al., 2019). Simultaneously, clothes renting remains a niche activity in the Nordic countries (Pedersen and Netter, 2015), and other results from the SCG survey indicate that the preferred providing activities in the SE are donating to second-hand shops and selling. Therefore, when respondents wish to handle their large stock of clothes, their interest in providing possibly refers to these activities. In Gothenburg, local regulation documents already identify clothes as a hotspot due to their high environmental impacts (Göteborgs Stad, 2017), so more specific actions could refer to further exploring and removing hinders to achieve a critical mass of both users and providers in clothes P2P sharing, or to explore other circular measures that do not rely on a said model.

On the other side of this polarity are found tools and leisure equipment, where the sharing interest mirrors the research by Böcker and Meelen (2017) and Laurenti and Acuña (2020). These product groups tend to have a longer lifespan (Curtis and Lehner, 2019), so high yearly consumption rates are not expected. They also present less hygiene concerns, less relation to users´ sense of style (Becker-Leifhold and Iran, 2018) and sparser use (Ellen Macarthur Foundation, 2016), which makes them more attractive for sharing. Nonetheless, these products still presented attitude-behavior gaps, as is commonly seen in sustainable practices (Moraes et al., 2012). This highlights a need to address hinders for sharing these product groups through local governance. Even if tools and leisure equipment would not contribute to a significantly reduced yearly consumption; sharing becomes relevant as they, along with electronics and clothes, have a higher likelihood of containing critical raw materials (European Commission, 2020b). For example, antimony, bauxite, and rubber are relevant for the textile industries; while cobalt, lithium, and graphite might be present in products with batteries. Further, larger tools such as lawnmowers and electric drills, as well as hobby items such as hiking shoes and skis, have among the highest amounts of CO_2eq per item from the products considered in the study (de Boer et al., 2021).

Coinciding with other research (Hansmann and Binder, 2023; McLachlan et al., 2016), the results also highlighted an unbalance between providing and consuming interest according to product. As an exception to the trend, in the SEsam results there was a higher interest in providing than consuming for clothes, furniture, and kitchen equipment. While noting the small sample sizes in this survey, the results could indicate a "dumping profile", where there might be more offer than demand for sharing these products. Extant literature concurs that achieving a balance between providers and users in P2P models is difficult, as people perceive more security and reliability from B2C initiatives. We propose two ways to address this: First, it is clear that motivations and barriers to sharing vary according to products and roles (Böcker and Meelen, 2017). Therefore, local authorities and SIs wishing to attract participants could adapt their strategies depending on the product and the role that they wish to attract – for example, removing consumer-specific barriers in clothes, or appealing to more sustainability-oriented users as providers for tool sharing. Second, the lack of trust in sharing (Eckhardt et al., 2019) could have impacted the results of this study. Since "intermediaries" provide increased safety and quality in P2P sharing, the fact that neither of the surveys have acknowledged this role could have affected the providing interest levels. Thus, authorities may decide to increase engagement in the SE through promoting B2C solutions; or by acknowledging and introducing intermediaries in P2P initiatives. While a lot of development is needed for P2P and P2B2P, these forms of sharing could be related to an improved sustainability performance (Curtis and Mont, 2020).

5.2. Demographic patterns

Men, in comparison to women, had highly significant negative associations to reducing their consumption and participating in sharing. In other studies, men have less sharing orientations (Lindblom and Lindblom, 2017), report weaker environmental attitudes than women (Zelezny et al., 2000), incur in behaviors that are associated to higher energy use and greenhouse gas emissions than women (Räty and Carlsson-Kanyama, 2010), and are less represented within groups affected by environmental degradation (OECD Publishing, 2021). That means that, while women generally display more sustainable attitudes and behaviors, they are more likely to be affected by possibly unfavorable consequences. It is therefore important for local authorities to explore the motivations of men, and to devise strategies to make sustainable consumption habits more appealing for them.

In terms of age, groups above 50 years of age presented significance in not having a high yearly consumption and not being very interested in sharing. However, within this group only those above 65 years presented significance for believing that they own too much. Research about consumption patterns across the life cycle of individuals points out that around age 40, consumption increases to accumulate assets before pension, and then decreases in older ages (Gourinchas and Parker, 2002). Therefore, respondents aged 50–65 might not believe they own too much because they are still in the asset accumulation phase, while for those over 65, this phase has concluded. Despite the lower interest in sharing (congruent with Lindblom and Lindblom, 2017; Buda et al., 2020; and Leland et al., 2023), this group represents an opportunity to act as providers of products in the SE. Miller et al. (2020) explore how the SE might support older people by reducing costs and providing opportunities to generate income, though barriers such as technology accessibility must be addressed. Further, considering higher levels of isolation in Sweden's elderly population (Folkhälsomyndigheten, 2022), and the higher social motivations for sharing in older groups (Böcker and Meelen, 2017), conditions could be created for them to access products through community-based initiatives as delineated by Acquier et al. (2017).

The only group that presented a clear potential for dematerialization was the respondents with post-secondary education. While some research indicates that individuals with higher education levels have a higher ecological footprint due to increased salaries and living standards (Ferreira et al., 2023; Zhang et al., 2015), it is also seen that higher environmental values and intentions to adopt sustainable consumption behaviors might lead this group to attempt to lower their footprints (Al-Nuaimi and Al-Ghamdi, 2022; Zhang et al., 2015). Some also identify that education is related to higher sharing interest and participation rates (Andreotti et al., 2017; Buda et al., 2020). In this study, the highly educated groups present favorable attitudes, but no significance was seen for behaviors. Therefore, governance could tackle external factors to eliminate the attitude-behavior gaps, for example, by supporting initiatives close to educational sites.

5.3. Broader dematerialization and governance implications

Gothenburg Municipality was originally interested in setting priorities for SE governance, focusing on which products and people would have the highest impact on sustainable consumption. Focusing on dematerialization, we set out to identify products or people with very high consumption, where the consumption could be willingly reduced without compromising the users´ sense of sufficiency, and where there was a very high interest or participation in the SE. However, not a single product or demographic group fulfilled all these conditions. Instead, we were able to observe great variance in the cases considered (i.e., the polarity between consuming and sharing products, the differences in attitude-behavior gaps and preferred sharing roles depending on the product, and the specific relationships to consuming and sharing that are portrayed by each demographic group). This has several implications for

governance and sustainability in general. On the one hand, under the current conditions, it is unlikely to achieve great impacts on dematerialization based on sharing, which makes governance even more necessary. Similarly, a prioritization standpoint from governance could be ineffective, as each product and demographic group presents different avenues to contribute to dematerialization – for example, increased sharing of clothes could reduce the highest amounts of unit consumption, sharing of leisure equipment and tools would address the types of materials used in the products, and engagement of older populations could release untapped products stocks to the rest of the population. Our results also have implications for specific barriers to dematerialization through sharing – for example, men present negative attitudes so that could be governance's starting point; while for the highly educated the focus is on turning positive attitudes to behaviors. Henry et al. (2021) and Codagnone and Martens (2016) agree that adapting policy interventions to different targets is highly relevant for effectively establishing SE practices. For example, the city of Amsterdam and the city of San Francisco addressed low-income individuals by increasing opportunities to share food and bikes (Voytenko Palgan et al., 2021); while the city of Seoul addressed elderly loneliness and a shortage of accommodation among the youth by supporting intergenerational housing sharing (Suh, 2020).

While the aim of this study was not to provide detailed governance recommendations, but to shine a light on patterns that might benefit from targeted governance, we encourage municipalities to draw from the recent literature in SE governance to identify strategies suitable for each highlighted product and demographic group. Based on Mccormick and Leire's (2020) mechanisms described in Section 2.3, "fostering" can be applied to roles or SIs that are less popular but hold potential for dematerialization (e.g., clothes) while "collaborating" and "measuring" have been applied in this study. As per Voytenko Palgan et al.'s (2021) framework, Gothenburg Municipality can further engage in the "providing" mechanism by offering funds, infrastructure, or subsiding rental costs for initiatives that target the highlighted product and demographic groups in this study. Further, the Municipality can create its own initiatives focusing on the highlighted product and demographic groups from an "initiative owner" role (Voytenko Palgan et al., 2021). This governing role is recommended when an initiative has insufficient interest from the citizens but is worth promoting due to its sustainability benefits (WEF, 2017) (e.g., SIs targeting the elderly population). Finally, through this work, the Municipality is engaging in "provision of data" (Voytenko Palgan et al., 2021). In many cities, data is released to facilitate ventures by SE entrepreneurs. Entrepreneurs could also benefit their planning and operations by partaking in our insights for different products, roles, and demographic groups.

5.4. Limitations

For the SEsam survey we utilized non-probability sampling, thus SEsam results must be taken as exploratory, non-generalizable, and as base for future studies. Regarding RO1, this affects the results on which products were the most consumed and which products have the most interest and current participation for sharing; and for RO2, which demographic groups consumed the most products, and which demographic groups had the most interest or participation in sharing products. Further, the non-probability sampling strategy might have led to selection and self-selection biases (see Section 3.2.1). While the SCG survey had a randomized sampling scheme, which addresses self-selection bias, the SEsam survey did not employ significant measures to minimize self-selection. To counter this, we utilized quota sampling and post-stratification of the data before analysis, which resulted in similar population strata as in Gothenburg. Further, the results showed relatively low rates of interest and participation in sharing, which could mean either that results were not significantly affected by self-selection bias, or that even in a population interested in sustainable consumption there is not much engagement in sharing, which reinforces the notion of governance being necessary to motivate individuals towards the SE. Social-desirability bias could also affect the results (see Section 3.2.1). This was addressed in the analysis by only considering the positive extreme in each variable (e.g., being "very interested" in sharing). Additionally, the smaller samples of the SEsam survey, particularly in the sharing section of the survey, made it harder to detect statistical significance in RO2 and to generalize results.

A main motivation for the SEsam survey was the lack of data for the Swedish HBS in over 10 years. However, the self-reporting format of the survey could have led to over- or underestimations in the consumption amounts, which is remedied by reporting categories instead of exact amounts (e.g., "very high consumption"). The COVID-19 pandemic, which coincided with data collection of both surveys, could have had impacts on the income reported by the participants, on increased contamination concerns affecting the interest in sharing, and on the consumption amounts per product. Studies in Switzerland and Sweden show that during the pandemic, the purchases of leisure items, furniture, and decoration increased, while consumption of clothes decreased (Esposti et al., 2021; Holmberg, 2021). Further, in both surveys, individuals were responsible for answering the survey, which prevents us from understanding the role of family dynamics in the matter of dematerialization. While we found that individual characteristics were more statistically significant than household characteristics (as in Politis et al., 2020, and Sarkar et al., 2020); other research highlights the relevance of household dynamics in how people consume, share, and engage in circular behaviors (Barbosa and Fonseca, 2019; Ottelin et al., 2020; Yates, 2018).

We also consider limitations regarding the variables included in both surveys. Not including gender as a variable in the SEsam survey is a major limitation, as the most statistically significant highlight of RO2 concerns gender. For other demographic groups, it was possible to explore attitudes and behaviors, but for gender, only attitudes towards consumption and sharing were considered, so insights are lacking regarding behaviors. Furthermore, the SCG survey did not consider other gender identities, which forces our results into a binary understanding of consumption and sharing and prevents us from exploring attitudes and behaviors with more nuance. Also, the lack of compatibility between the age categories in each survey (see Appendix D – Table D.2) represented a difficulty in normalizing results. As this affects how the age highlight can be understood, we limit age-specific language and focus on the age progression.

Finally, we address our conceptualization of dematerialization. Assuming the number of purchases during a single year as a measure for dematerialization potential favors products with shorter life spans and higher turnover rates (such as clothes) rather than products that are bought less often but which might be more resource intensive. Therefore, our study provides simplified insights about dematerialization potential from a resource use perspective. Ultimately, the underlying conceptualization for dematerialization can be questioned, as previous studies have shown that reducing consumption in combination with adopting circular behaviors does not guarantee a direct reduction of material footprint, but that dematerialization is contingent on production patterns (Junnila et al., 2018). This means that our results only point to the potential contribution of private individuals on dematerialization, but we do not engage in analyzing the matter from a life-cycle perspective.

5.5. Future research propositions

Many of the limitations of this study pertain to the sampling strategy of the SEsam survey. While some measures have been applied to minimize these constraints, we recommend further studies to confirm the generalizability of the SEsam results. Given that the SEsam survey was mainly conducted to compensate for the lack of a Swedish Household Budget Survey during 2020, a future survey shall focus on the sharing variables rather than on consumption. It should also adopt a probability

sampling design and include a gender variable. To understand the potential for dematerialization through sharing at an international scale, the study could also be mirrored in other cities.

To further the understanding of what sharing can contribute to sustainability, a possibility for future studies would be to include factor analyses to confirm the significance of different consumption and sharing variables for the potential of dematerialization. Considering RO1, richer estimations of SE's sustainability potential per product could be achieved by including additional metrics in the consumption and sharing dimensions. The SE research field is increasingly studying the environmental effects of sharing products through life-cycle assessments (Martin, 2018; Zamani et al., 2017), input-output assessments (Ala-Mantila et al., 2017), and material flow accounting (Vélez, 2019), so similar metrics could be included following the procedure of Whetstone et al. (2020). Considering RO2, in-depth investigations should be conducted to understand the motivations, barriers, and preferences of the highlighted demographic groups. Case studies focused on gender, age, and educational level differences could reveal additional pathways to encourage relevant groups towards dematerialization through the SE. Further, this study considers characteristics in isolation, but studying characteristics in combination might render different results. Beretta et al. (2021), for example, created consumer profiles based on socio-demographic characteristics and psychological variables, Buda et al. (2020) identified the most open population to the SE based on age, income and education, and Whetstone et al. (2020) created household archetypes combining socio-demographic characteristics.

Finally, the present study might be followed up by investigating what patterns can be seen in consumption and sharing according to different neighborhoods. The municipality has already expressed an interest in spatial analysis of the SE, as results from another survey in Gothenburg underline the relevance of location for engaging in sharing (Öhrwall, 2021). Additionally, both the results from this article and potential spatial analyses could result in more appropriate governance recommendations in future studies by adopting a multi-disciplinary approach, where collaboration with governance academics and actors is pursued.

6. Conclusions

This study contributes to the understanding of the SE's potential to reduce household consumption. By investigating the potential for dematerialization from the perspectives of different product and demographic groups, the study provides valuable insights for local governance of the SE in Gothenburg. The collaboration between local government and academia in this study ensures that the needs and goals of the authorities are directly addressed, offering a novel approach to SE research. The findings could foster a more proactive governance of the SE, as to maximize its potential benefits and contribute to sustainable household consumption and the city's environmental goals.

Several key insights emerge from the study. The patterns of high consumption combined with low sharing, and vice versa, imply preferred modes of accessing products. The higher interest in providing clothes rather than accessing them through the SE suggests a potential for further action, such as exploring circular measures that do not rely solely on peer-to-peer models. Otherwise, the lower interest in providing compared to using for other products like tools and leisure equipment, highlights the need to address the disconnect between what people want to borrow and what they are willing to lend. Introducing intermediaries or business-to-consumer initiatives can enhance the perceived security and reliability of sharing, attracting more participants. The study also suggests demographic differences in attitudes and behaviors related to consumption and sharing. Men showed a lower interest in reducing consumption and participating in sharing activities than women, which leads to the suggestion of exploring their motivations and devising strategies to make sustainable consumption more appealing to this demographic group. Older adults, who in comparison to younger groups express a belief of owning too much but do not report high consumption levels, present an opportunity to facilitate their participation as providers in the SE and to support community-based sharing. Highly educated respondents presented positive attitudes towards dematerialization, and their transition towards implementing pertinent behaviors can be supported by creating SIs close to educational sites.

Methodologically, organizing variables based on consumption and sharing dimensions could be advantageous for stakeholders such as municipalities, enabling them to select variables aligned with their sustainability goals. The study's approach offers a cost-effective method for complementing existing survey data and can be replicated in future research. Regarding limitations, the non-probability sampling method, potential for biases and smaller samples in the SEsam survey, as well as aspects of combining independent surveys, restrict the generalizability of the results. Further, the timing of the study coinciding with the COVID-19 pandemic might impact variables related to product consumption and disposable income. Future research can address these limitations and explore the SE in different geographic areas within Gothenburg, as well as making more complex considerations of demographic characteristics, and incorporating additional metrics, such as material intensity and life cycle assessment, to provide a richer understanding of how the SE contributes to other sustainability goals.

Declaration of Generative AI and AI-assisted technologies in the writing process

During the preparation of this work the author(s) used ChatGPT 3.5 in order to improve the language and readability. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

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 A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.spc.2024.01.009.

References

Abbott, K.W., 2017. Orchestration: Strategic Ordering in Polycentric Climate Governance (Available at SSRN 2983512).
Abbott, K.W., Genschel, P., Snidal, D., Zangl, B., 2015. International Organizations as Orchestrators. Cambridge University Press.

Acquier, A., Daudigeos, T., Pinkse, J., 2017. Promises and paradoxes of the sharing economy: an organizing framework. Technol. Forecast. Soc. Chang. 125, 1–10. https://doi.org/10.1016/j.techfore.2017.07.006 (2017/12/01).
Agyeman, J., 2013. Introducing Just Sustainabilities: Policy, Planning, and Practice. Zed Books Ltd.
Agyeman, J., McLaren, D., Schaefer-Borrego, A., 2013. Sharing cities. Friends of the earth. https://shareableandliveable.files.wordpress.com/2015/02/agyeman-et-al-2013-sharing-cities.pdf.
Ala-Mantila, S., Ottelin, J., Heinonen, J., Junnila, S., 2017. Reprint of: to each their own? The greenhouse gas impacts of intra-household sharing in different urban zones. J. Clean. Prod. 163, S79–S90. https://doi.org/10.1016/j.jclepro.2017.05.138.
Al-Nuaimi, S.R., Al-Ghamdi, S.G., 2022. Sustainable consumption and education for sustainability in higher education. Sustainability 14 (12), 7255.
Andreotti, A., Anselmi, G., Eichhorn, T., Hoffmann, C.P., Jürss, S., Micheli, M., 2017. European perspectives on participation in the sharing economy. In: European Perspectives on Participation in the Sharing Economy (October 2, 2017).
Angelov, N., Waldenström, D., 2021. COVID-19 and income inequality: evidence from administrative tax registers. https://www.skatteverket.se/download/18.96cca41179bad4b1aa27be/1624888258617/COVID-19%20and%20Income%20Inequality.pdf.
Barbosa, B., Fonseca, I., 2019. A phenomenological approach to the collaborative consumer. J. Consum. Mark. 36 (6), 705–714. https://doi.org/10.1108/JCM-11-2017-2468.
Bardhi, F., Eckhardt, G.M., 2012. Access-based consumption: the case of car sharing. J. Consum. Res. 39 (4), 881–898. https://doi.org/10.1086/666376.
Barile, S., Ciasullo, M.V., Iandolo, F., Landi, G.C., 2021. The city role in the sharing economy: toward an integrated framework of practices and governance models. Cities 119, 103409. https://doi.org/10.1016/j.cities.2021.103409 (2021/12/01).
Barkman, H., Wedberg, C., 2021. Sharing Towns Slutrapport 2021. https://karlstad.se/globalassets/filer/miljo/avfall_och_atervinning/slutrapport-karlstad-delar.pdf.
Becker-Leifhold, C., Iran, S., 2018. Collaborative Fashion Consumption – Drivers, Barriers and Future Pathways. https://doi.org/10.1108/jfmm-10-2017-0109.
Belk, R., 2014. You are what you can access: sharing and collaborative consumption online. J. Bus. Res. 67 (8), 1595–1600. https://doi.org/10.1016/j.jbusres.2013.10.001 (2014/08/01/).
Bellotti, V., Ambard, A., Turner, D., Gossmann, C., Demkova, K., Carroll, J.M., 2015. A muddle of models of motivation for using peer-to-peer economy systems. In: Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems, Seoul, Republic of Korea. https://doi.org/10.1145/2702123.2702272.
Benkler, Y., 2004. Sharing nicely: on shareable goods and the emergence of sharing as a modality of economic production. Yale LJ 114, 273. https://openedreader.org/chapter/sharing-nicely-on-shareable-goods-and-the-emergence-of-sharing-as-a-modality-of-economic-production/.
Benoit, S., Baker, T.L., Bolton, R.N., Gruber, T., Kandampully, J., 2017. A triadic framework for collaborative consumption (CC): motives, activities and resources & capabilities of actors. J. Bus. Res. 79, 219–227. https://doi.org/10.1016/j.jbusres.2017.05.004 (2017/10/01).
Beretta, E., Miniero, G., Ricotta, F., 2021. Consumers' journey between liquid and solid consumption. Sustainability 13 (24). https://doi.org/10.3390/su132413730.
Bernardi, M., Diamantini, D., 2018. Shaping the sharing city: an exploratory study on Seoul and Milan. J. Clean. Prod. 203, 30–42. https://doi.org/10.1016/j.jclepro.2018.08.132 (2018/12/01).
Blair, J., Czaja, R.F., Blair, E.A., 2013. Designing Surveys: A Guide to Decisions and Procedures. Sage Publications.
Böcker, L., Meelen, T., 2017. Sharing for people, planet or profit? Analysing motivations for intended sharing economy participation. Environ. Innov. Soc. Trans. 23, 28–39. https://doi.org/10.1016/j.eist.2016.09.004 (2017/06/01).
de Boer, F., Ekander, J., Frendberg, T., Wiksten, K., 2021. Delningsekonomins potentiella påverkan på utsläpp från hushållskonsumtion i Göteborg. Chalmers University of Technology.
Botsman, R., 2013. The sharing economy lacks a shared definition. In: The Sharing Economy Lacks a Shared Definition.
Botsman, R., Rogers, R., 2010. What's Mine Is Yours: The Rise of Collaborative Consumption.
Buda, G., Pethes, B., Lehota, J., 2020. Dominant consumer attitudes in the sharing economy-a representative study in Hungary. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85078849878&doi=10.3390%2fresources9010001&partnerID=40&md5=86bc5ee089b309bd7da4e070ec954639.
Buldeo Rai, H., Verlinde, S., Macharis, C., 2021. Who is interested in a crowdsourced last mile? A segmentation of attitudinal profiles. Travel Behav. Soc. 22, 22–31. https://doi.org/10.1016/j.tbs.2020.08.004.
Chen, G., Hadjikakou, M., Wiedmann, T., Shi, L., 2018. Global warming impact of suburbanization: the case of Sydney. J. Clean. Prod. 172, 287–301. https://doi.org/10.1016/j.jclepro.2017.10.161.
Cheng, M., 2016. Sharing economy: a review and agenda for future research. Int. J. Hosp. Manag. 57, 60–70. https://doi.org/10.1016/j.ijhm.2016.06.003.
Codagnone, C., Martens, B., 2016. Scoping the sharing economy: origins, definitions, impact and regulatory issues. In: Scoping the Sharing Economy: Origins, Definitions, Impact and Regulatory Issues.
Cohen, B., Muñoz, P., 2016. Sharing cities and sustainable consumption and production: towards an integrated framework. J. Clean. Prod. 134, 87–97. https://doi.org/10.1016/j.jclepro.2015.07.133.
Communication From the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A New Circular Economy Action Plan - For a Cleaner and More Competitive Europe, 2020.
Curtis, S.K., Lehner, M., 2019. Defining the sharing economy for sustainability. Sustainability 11 (3), 567. https://doi.org/10.3390/su11030567.
Curtis, S.K., Mont, O., 2020. Sharing economy business models for sustainability. J. Clean. Prod. 266, 121519 https://doi.org/10.1016/j.jclepro.2020.121519.
Eckhardt, G.M., Houston, M.B., Jiang, B., Lamberton, C., Rindfleisch, A., Zervas, G., 2019. Marketing in the Sharing Economy. J. Mark. 83 (5), 5–27. https://doi.org/10.1177/0022242919861929.
Ellen Macarthur Foundation, 2016. How tool sharing could become a public utility: Toronto Tool Library and Makerspace. Retrieved May from. https://ellenmacarthurfoundation.org/circular-examples/how-tool-sharing-could-become-a-public-utility.
Ertz, M., Lecompte, A., Durif, F., 2017. Dual roles of consumers: towards an insight into collaborative consumption motives. Int. J. Mark. Res. 59 (6), 725–748. https://doi.org/10.2501/IJMR-2017-040 (article).
Esposti, P.D., Mortara, A., Roberti, G., 2021. Sharing and sustainable consumption in the era of covid-19. Sustainability (Switzerland) 13 (4), 1–15. https://doi.org/10.3390/su13041903.
Ferreira, J.-P., Marques, J.L., Moreno Pires, S., Iha, K., Galli, A., 2023. Supporting national-level policies for sustainable consumption in Portugal: a socio-economic Ecological Footprint analysis. Ecol. Econ. 205, 107687 https://doi.org/10.1016/j.ecolecon.2022.107687 (2023/03/01).
Folkhälsomyndigheten, 2022. Ensamhet och isolering vanligast bland unga och de äldsta. Retrieved May from. https://www.folkhalsomyndigheten.se/nyheter-och-press/nyhetsarkiv/2022/december/ensamhet-och-isolering-vanligast-bland-unga-och-de-aldsta/.
Frenken, K., 2017. Political economies and environmental futures for the sharing economy. Philos. Trans. R. Soc. A Math. Phys. Eng. Sci. 375 (2095) https://doi.org/10.1098/rsta.2016.0367.
Frenken, K., Schor, J., 2017. Putting the sharing economy into perspective. Environ. Innov. Soc. Trans. 23, 3–10. https://doi.org/10.1016/j.eist.2017.01.003 (2017/06/01).
Geissinger, A., Laurell, C., Öberg, C., Sandström, C., 2019. How sustainable is the sharing economy? On the sustainability connotations of sharing economy platforms. J. Clean. Prod. 206, 419–429. https://doi.org/10.1016/j.jclepro.2018.09.196 (2019/01/01).
Göteborg Stad, 2021. Kartläggning Göteborgs Stads budgetmål och övergripande styrning i förhållande till Agenda 2030 - Globala målen för hållbar utveckling. https://goteborg.se/wps/wcm/connect/e1ea8873-d1f9-4bc9-847b-e48e825f34c1/Kartläggning+2021+Agenda+2030.pdf?MOD=AJPERES.
Göteborgs Stad, 2017. Fossilfritt Göteborg—Vad krävs (Miljöförvaltningen: Gothenburg, Sweden, Issue). https://goteborg.se/wps/wcm/connect/e260f66a-077f-459c-a073-5e1c318c98bd/N800_R_2018_13.pdf?MOD=AJPERES.
Göteborgs Stad Statistik och Analys, 2022. Statistikdatabasen. Retrieved June 15 from. https://goteborg.se/wps/portal/enhetssida/statistik-och-analys/goteborgsbladet/hamta-statistik/statistikdatabas.
Gourinchas, P.-O., Parker, J.A., 2002. Consumption over the life cycle. Econometrica 70 (1), 47–89. https://doi.org/10.1111/1468-0262.00269.
Gullstrand Edbring, E., Lehner, M., Mont, O., 2016. Exploring consumer attitudes to alternative models of consumption: motivations and barriers. J. Clean. Prod. 123, 5–15. https://doi.org/10.1016/j.jclepro.2015.10.107 (article).
Guräu, C., Ranchhod, A., 2020. The sharing economy as a complex dynamic system: exploring coexisting constituencies, interests and practices. J. Clean. Prod. 245, 118799 https://doi.org/10.1016/j.jclepro.2019.118799.
Hamari, J., Sjöklint, M., Ukkonen, A., 2016. The Sharing Economy: Why People Participate in Collaborative Consumption. https://doi.org/10.1002/asi.23552.
Hansmann, R., Binder, C.R., 2023. Promoting synergies for sustainability through peer-to-peer sharing: an analysis of drivers and barriers. Int J Sust Dev World 30 (7), 792–813. https://doi.org/10.1080/13504509.2023.2205831 (article).
Hazée, S., Van Vaerenbergh, Y., Delcourt, C., Warlop, L., 2019. Sharing goods? Yuck, no! An investigation of consumers' contamination concerns about access-based services. J. Serv. Res. 22 (3), 256–271. https://doi.org/10.1177/1094670519838622.
Hazée, S., Zwienenberg, T.J., Van Vaerenbergh, Y., Faseur, T., Vandenberghe, A., Keutgens, O., 2020. Why customers and peer service providers do not participate in collaborative consumption. J. Serv. Manag. 31 (3), 397–419. https://doi.org/10.1108/JOSM-11-2018-0357.
Hellevik, O., 2009. Linear versus logistic regression when the dependent variable is a dichotomy. Qual. Quant. 43, 59–74.
Henry, M., Schraven, D., Bocken, N., Frenken, K., Hekkert, M., Kirchherr, J., 2021. The battle of the buzzwords: a comparative review of the circular economy and the sharing economy concepts. Environ. Innov. Soc. Trans. 38, 1–21. https://doi.org/10.1016/j.eist.2020.10.008 (2021/03/01).
Holmberg, U., 2021. Konsumtionsrapporten 2021 (2002-8156). https://www.gu.se/sites/default/files/2021-12/TE_konsumtionsrapporten%202021_korr.pdf.
Holt, D., Smith, T.F., 1979. Post stratification. Journal of the Royal Statistical Society Series A: Statistics in Society 142 (1), 33–46.
Hong, S., Lee, S., 2018. Adaptive governance and decentralization: evidence from regulation of the sharing economy in multi-level governance. Gov. Inf. Q. 35 (2), 299–305. https://doi.org/10.1016/j.giq.2017.08.002 (2018/04/01).
Hossain, M., 2020. Sharing economy: a comprehensive literature review. Int. J. Hosp. Manag. 87, 102470 https://doi.org/10.1016/j.ijhm.2020.102470 (2020/05/01).
Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Critical Raw Materials Resilience: charting a path towards greater security and sustainability. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0474, 2020.

Institutet för kvalitetsindikatorer AB, 2021. Teknisk rapport: Attitydundersökning om delningsekonomin i Göteborgs Stad [Techical Report: Survey of Attitudes About the Sharing Economy in Gothenburg City].
Internetstiftelsen, 2021. Svenskarna och internet 2021. Retrieved October from. https://svenskarnaochinternet.se/rapporter/svenskarna-och-internet-2021/sociala-medier/#facebook.
Jämställdnetsmyndigheten, 2021. Män har förlorat jobb på grund av pandemin – kvinnor inkomster. Retrieved July from. https://www.jamstalldhetsmyndigheten.se/nyhet/coronapandemin-och-ekonomin-ur-ett-jamstalldhetsperspektiv.
Jelinkova, M., Tetrevova, L., Vavra, J., Munzarova, S., 2021. The sharing economy in the context of sustainable development and social responsibility: the example of the Czech Republic. Sustainability (Switzerland) 13 (17), 9886. https://doi.org/10.3390/su13179886 (article).
Johansson-Stenman, O., Svedsäter, H., 2012. Self-image and valuation of moral goods: stated versus actual willingness to pay. J. Econ. Behav. Organ. 84 (3), 879–891.
Jones, M.K., Calzavara, L., Allman, D., Worthington, C.A., Tyndall, M., Iveniuk, J., 2016. A comparison of web and telephone responses from a national HIV and AIDS survey. JMIR Public Health Surveill. 2 (2), e5184.
Junnila, S., Ottelin, J., Leinikka, L., 2018. Influence of reduced ownership on the environmental benefits of the circular economy. Sustainability (Switzerland) 10 (11). https://doi.org/10.3390/su10114077.
Kallis, G., 2017. Radical dematerialization and degrowth. Philos. Trans. R. Soc. A Math. Phys. Eng. Sci. 375 (2095), 20160383 https://doi.org/10.1098/rsta.2016.0383.
Kim, N.L., Jin, B.E., 2020. Why buy new when one can share? Exploring collaborative consumption motivations for consumer goods. Int. J. Consum. Stud. 44 (2), 122–130. https://doi.org/10.1111/ijcs.12551.
Kim, J.K., Rao, J.N., 2012. Combining data from two independent surveys: a model-assisted approach. Biometrika 99 (1), 85–100.
Laurenti, R., Acuña, F.M.B., 2020. Exploring antecedents of behavioural intention and preferences in online peer-to-peer resource sharing: a Swedish university setting. Sustainable Production and Consumption 21, 47–56. https://doi.org/10.1016/j.spc.2019.10.002 (article).
Leland, S.M., Pinka, R., Boyer, R.H.W., 2023. Who shares? Participation in the sharing economy in the U.S. J. Urban Aff. https://doi.org/10.1080/07352166.2023.2221438 (article).
Leung, X.Y., Xue, L., Wen, H., 2019. Framing the sharing economy: toward a sustainable ecosystem. Tour. Manag. 71, 44–53. https://doi.org/10.1016/j.tourman.2018.09.021 (2019/04/01).
Lindblom, A., Lindblom, T., 2017. De-ownership orientation and collaborative consumption during turbulent economic times. Int. J. Consum. Stud. 41 (4), 431–438. https://doi.org/10.1111/ijcs.12336 (article).
Lutz, C., Newlands, G., 2018. Consumer segmentation within the sharing economy: the case of Airbnb. J. Bus. Res. 88 (C), 187–196. https://doi.org/10.1016/j.jbusres.2018.03.019.
Ma, Y., Lan, J., Thornton, T., Mangalagiu, D., Zhu, D., 2018. Challenges of collaborative governance in the sharing economy: the case of free-floating bike sharing in Shanghai. J. Clean. Prod. 197, 356–365. https://doi.org/10.1016/j.jclepro.2018.06.213 (2018/10/01).
Magnusson, D., Palm, J., 2019. Come together—the development of Swedish energy communities. Sustainability 11 (4), 1056.
Malmö Innovationsarena, 2016. Malmöbon och delad konsumtion. https://static1.squarespace.com/static/59e86b55aeb625e2140eec1a/t/611ba6abf0cb0b6c234477a4/1629202094748/Malmöbon+och+delad+konsumtion.pdf.
Martin, M., 2018. Sharing services and environmental impacts: an assessment of selected services in the Hammarby Sjöstad region of Stockholm. https://www.ivl.se/download/18.2aa2697816097278807dfd0/1521663910609/C287.pdf.
Mccormick, K., Leire, C., 2020. Cities and Consumption: sharing cities and achieving the sustainable development goals. https://portal.research.lu.se/en/publications/cities-and-consumption-sharing-cities-and-achieving-the-sustainab.
McLachlan, R., Opila, C., Shah, N., Sun, E., Naaman, M., 2016. You can't always get what you want: challenges in P2P resource sharing. In: C3 - Conference on Human Factors in Computing Systems - Proceedings. 07-12-May-2016, pp. 1301–1307. https://doi.org/10.1145/2851581.2892358.
Miles, M.B., Huberman, A.M., Saldana, J., 2019. Qualitative Data Analysis: A Methods Sourcebook.
Miller, J., Ward, C., Lee, C., D'Ambrosio, L., Coughlin, J., 2020. Sharing is caring: the potential of the sharing economy to support aging in place. Gerontol. Geriatr. Educ. 41 (4), 407–429. https://doi.org/10.1080/02701960.2018.1428575 (2020/10/01).
Mont, O., Palgan, Y.V., Bradley, K., Zvolska, L., 2020. A decade of the sharing economy: concepts, users, business and governance perspectives. J. Clean. Prod. 269, 122215 https://doi.org/10.1016/j.jclepro.2020.122215 (2020/10/01).
Moon, M.J., 2017. Government-driven sharing economy: lessons from the sharing city initiative of the Seoul Metropolitan government. J. Dev. Soc. 33 (2) https://doi.org/10.1177/0169796X17710076.
Moraes, C., Carrigan, M., Szmigin, I., 2012. The coherence of inconsistencies: attitude-behaviour gaps and new consumption communities. J. Mark. Manag. 28 (1–2), 103–128. https://doi.org/10.1080/0267257X.2011.615482.
Morone, P., Falcone, P.M., Imbert, E., Morone, A., 2018. Does food sharing lead to food waste reduction? An experimental analysis to assess challenges and opportunities of a new consumption model. J. Clean. Prod. 185, 749–760. https://doi.org/10.1016/j.jclepro.2018.01.208.
Muñoz, P., Cohen, B., 2017. Mapping out the sharing economy: a configurational approach to sharing business modeling. Technol. Forecast. Soc. Chang. 125, 21–37.
Noh, Y., Ro, J.Y., Jeong, D.K., 2020. A study on users' perception of the role of library in the sharing economic era in Korea. Library Hi Tech 38 (3), 654–677. https://doi.org/10.1108/LHT-01-2019-0015.
OECD Publishing, 2021. Gender and the Environment: Building Evidence and Policies to Achieve the SDGs. https://doi.org/10.1787/3d32ca39-en.
Öhrwall, E., 2021. Göteborgarna & delningsekonomin. https://goteborg.se/wps/wcm/connect/a5a8a992-1e1d-4221-bae4-ad4e9e194d82/Göteborgarna+och+delningsekonomin_2021.pdf?MOD=AJPERES.
Ottelin, J., Cetinay, H., Behrens, P., 2020. Rebound effects may jeopardize the resource savings of circular consumption: evidence from household material footprints. Environ. Res. Lett. 15 (10) https://doi.org/10.1088/1748-9326/abaa78.
Owyang, J., Tran, C., Silva, C., 2013. The Collaborative Economy. Altimeter, United States.
Palm, J., Södergren, K., Bocken, N., 2019. The Role of Cities in the Sharing Economy: Exploring Modes of Governance in Urban Sharing Practices.
Pedersen, E.R.G., Netter, S., 2015. Collaborative consumption: business model opportunities and barriers for fashion libraries. J. Fash. Mark. Manag. 19 (3), 258–273. https://doi.org/10.1108/JFMM-05-2013-0073.
Politis, I., Fyrogenis, I., Papadopoulos, E., Nikolaidou, N., Verani, E., 2020. Shifting to shared wheels: factors affecting dockless bike-sharing choice for short and long trips. Sustainability (Switzerland) 12 (19). https://doi.org/10.3390/su12198205.
Puschmann, T., Alt, R., 2016. Sharing economy. Bus. Inf. Syst. Eng. 58 (1), 93–99. https://doi.org/10.1007/s12599-015-0420-2.
Räty, R., Carlsson-Kanyama, A., 2010. Energy consumption by gender in some European countries. Energy Policy 38 (1), 646–649. https://doi.org/10.1016/j.enpol.2009.08.010.
Sands, S., Ferraro, C., Campbell, C., Kietzmann, J., Andonopoulos, V.V., 2020. Who shares? Profiling consumers in the sharing economy. Australas. Mark. J. 28 (3), 22–33. https://doi.org/10.1016/j.ausmj.2020.06.005.
Sarkar, A., Koohikamali, M., Pick, J.B., 2020. Spatial and socioeconomic analysis of host participation in the sharing economy: Airbnb in New York City. Inf. Technol. People 33 (3), 983–1009. https://doi.org/10.1108/ITP-10-2018-0481.
Schaefers, T., Wittkowski, K., Benoit, S., Ferraro, R., 2016. Contagious effects of customer misbehavior in access-based services. J. Serv. Res. 19 (1), 3–21.
Schor, J., 2016. Debating the sharing economy. Journal of Self-Governance and Management Economics 4 (3), 7–22.
Schor, J.B., Wengronowitz, R., 2017. The new sharing economy: enacting the eco-habitus. In: Social Change and the Coming of Post-consumer Society. Routledge, pp. 25–42.
Sharing Cities Sweden, 2021a. Sharing Cities Sweden. Retrieved June 13 from. https://www.sharingcities.se.
Sharing Cities Sweden, 2021b. Sharing City Göteborg. Retrieved 13 June from. https://www.sharingcities.se/goteborgtestbed.
Shmidt, M., 2019. The sharing economy and its paradoxes: a sociological study of sharing communities in Russia. Mir Rossii 28 (2), 148–171. https://doi.org/10.17323/1811-038X-2019-28-2-148-171.
Statistics Sweden, 2022. Finding statistics. Retrieved June 15 from. https://www.scb.se/en/finding-statistics/.
Statistiska Centralbyrån, 2013. Hushållens utgifter 2012: Beskrivning av statistiken. https://www.scb.se/contentassets/90c71dbdb84c4fb5abb66896f3a478e6/he0201_do_2012.pdf.
Strulak-Wójcikiewicz, R., & Wagner, N. (2021). Exploring opportunities of using the sharing economy in sustainable urban freight transport. Sustain. Cities Soc., 68(0). doi:https://doi.org/10.1016/j.scs.2021.102778.
Suh, K.-S., 2020. Analysis of shared life between the elderly and the young at homeshare in Seoul based on case studies. Architectural Research 22 (3), 97–104.
Sutherland, W., Jarrahi, M.H., 2018. The sharing economy and digital platforms: a review and research agenda. Int. J. Inf. Manag. 43, 328–341. https://doi.org/10.1016/j.ijinfomgt.2018.07.004 (2018/12/01).
United Nations, 2021a. 12 - ensure sustainable consumption and production patterns. Retrieved September from. https://sdgs.un.org/goals/goal12.
United Nations, 2021b. The Sustainable Development Goals Report 2021. https://unstats.un.org/sdgs/report/2021/The-Sustainable-Development-Goals-Report-2021.pdf.
Vélez, A.M.A., 2019. Quantifying sustainability impacts of the sharing economy at city level. https://static1.squarespace.com/static/581097b4e3df28ce37b24947/t/5dd309690fb697248c15d179/1574111689193/Working+paperVelez.pdf.
Vith, S., Oberg, A., Höllerer, M.A., Meyer, R.E., 2019. Envisioning the 'Sharing City': governance strategies for the sharing economy. J. Bus. Ethics 159 (4), 1023–1046. https://doi.org/10.1007/s10551-019-04242-4 (2019/11/01).
Voytenko Palgan, Y., Mont, O., Sulkakoski, S., 2021. Governing the sharing economy: towards a comprehensive analytical framework of municipal governance. Cities 108, 102994. https://doi.org/10.1016/j.cities.2020.102994.
WEF, 2017. Collaboration in cities: from sharing to "sharing economy", issue. https://www3.weforum.org/docs/White_Paper_Collaboration_in_Cities_report_2017.pdf.
Whetstone, A., Kalmykova, Y., Rosado, L., Lavers Westin, A., 2020. Informing sustainable consumption in urban districts: a method for transforming household expenditures into physical quantities. Sustainability 12 (3), 802. https://doi.org/10.3390/su12030802.
Xiang, D., Jiao, G., Sun, B., Peng, C., Ran, Y., 2022. Prosumer-to-customer exchange in the sharing economy: evidence from the P2P accommodation context. J. Bus. Res. 145, 426–441. https://doi.org/10.1016/j.jbusres.2022.02.077 (2022/06/01).
Yates, L., 2018. Sharing, households and sustainable consumption. J. Consum. Cult. 18 (3), 433–452. https://doi.org/10.1177/1469540516668229.

Zamani, B., Sandin, G., Peters, G.M., 2017. Life cycle assessment of clothing libraries: can collaborative consumption reduce the environmental impact of fast fashion? J. Clean. Prod. 162, 1368–1375. https://doi.org/10.1016/j.jclepro.2017.06.128.
Zelezny, L.C., Chua, P.P., Aldrich, C., 2000. New ways of thinking about environmentalism: elaborating on gender differences in environmentalism. J. Soc. Issues 56 (3), 443–457. https://doi.org/10.1111/0022-4537.0017.
Zhang, X., Luo, L., Skitmore, M., 2015. Household carbon emission research: an analytical review of measurement, influencing factors and mitigation prospects. J. Clean. Prod. 103, 873–883. https://doi.org/10.1016/j.jclepro.2015.04.024 (2015/09/15).