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A cross-sector analysis of consumer intention towards sustainable product-service systems: Evidence from mobility, clothing and tooling

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ABSTRACT

Sustainable Product-Service Systems (SPSS) offer a promising solution to sustainability challenges in modern consumption. Yet, enduring adoption of SPSS by consumers is still uncertain and identifying the factors affecting SPSS adoption is complex. This study investigates the drivers and barriers (D&B) of SPSS adoption intention, analysing their variations across three distinct areas of need: mobility, clothing, and tooling. A comprehensive framework is constructed to categorize D&B into cognitive, attitudinal, comparative, and emotional factors, drawing upon extensive literature. The significance and intensity of these D&B are empirically assessed through a survey of Brussels consumers, revealing variations among areas of need. From this analysis, three distinct categories of D&B are identified: generic ones, transcending area-specific differences (e.g., the financial advantage); irrelevant ones, exhibiting general non-significance across all areas (e.g., the absence of maintenance worries); and area-specific ones, pertinent to certain, but not all, areas of need (e.g., the consumerist attitude in the tooling area of need). This study contributes to an enhanced understanding of SPSS adoption, offers valuable insights for businesses to tailor their strategies and promotes sustainable consumption practices.

1. Introduction

In a context of rising economic and environmental challenges, new business models have emerged to foster more sustainable modes of consumption. Among them, Sustainable Product Service Systems (SPSS) are receiving increasing attention in the literature (Annarelli et al., 2016; Mont and Tukker, 2006; Tukker, 2015; Yang and Evans, 2019). Based on existing definitions, SPSS can be defined as a model that provides access to one or more products or to a product-service system (PSS) as a sustainable alternative to the sale of the product in question (see Baines et al., 2007; Mont, 2002; Tukker, 2004; Vezzoli et al., 2015).

SPSS fall within the larger category of business models referred to as PSS. The usual typology (Tukker, 2004) distinguishes three forms of PSS depending on the degree of service integration and product ownership: product-oriented, use-oriented and performance-oriented PSS. These categories delineate a spectrum ranging from businesses primarily emphasizing the product to those prioritizing the service component of PSS. In the context of the present research, the significance of this PSS categorization lies in the fact that solutions emphasizing the performance aspect of PSS are generally perceived to possess greater sustainability potential than those leaning towards the product-centric end. Indeed, the actual impact of PSS on sustainability remains a subject of ongoing debate, with no conclusive empirical evidence supporting a universally superior environmental performance (Annarelli et al., 2016; Hahn and Pinkse, 2022; Kjaer et al., 2018). Nonetheless, PSS offers that emphasize the *performance* aspect have the potential to enhance the use of products by making them available to multiple customers. This intensified usage of objects holds promise to contribute to a systemic reduction in the material intensity of economic activities (Borg et al., 2020; Roman et al., 2023; Tukker, 2004; Tunn et al., 2019). In this

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regard, such PSS offers are commonly considered as sufficiently sustainable for being referred to as SPSS (Cook, 2014; Roy, 2000; Vezzoli et al., 2015). However, the true sustainability impact ultimately depends on the specific context of adoption and, critically, on the behaviours they replace, which must be taken into account to assess whether SPSS can genuinely deliver sustainability improvements (Chapman et al., 2020; Roman et al., 2023).

While SPSS have the potential to facilitate the shift towards sustainability, they are struggling to develop on the supply side (Pacheco et al., 2019; Vezzoli et al., 2015) and even more so on the demand side. Indeed, transitioning from traditional product-based consumption to embracing the functional utility provided by SPSS often entails significant adjustments for consumers in their attitudes and practices (Muylaert and Maréchal, 2022). As a result, a growing emphasis has been put on researching consumer attitudes and practices in relation to SPSS (Akbar and Hoffmann, 2018; Armstrong et al., 2015; Becker-Leifhold, 2018; Camacho-Otero et al., 2019; D'Agostin et al., 2020; Elzinga et al., 2020; Vafadarnikjoo et al., 2018).

Scholars have undertaken investigations to shed light on this complex landscape. Some have conducted comparative analyses of consumer attitudes towards different alternative consumption models, such as second-hand, repair and collaborative or sharing models (Edbring et al., 2016; Khitous et al., 2022; Minami et al., 2021; Pérez-Belis et al., 2017; Piscicelli et al., 2015; Schallehn et al., 2019). Others have sought to identify the underlying values influencing consumer practices towards SPSS (Becker-Leifhold, 2018; Borg et al., 2020; Piscicelli et al., 2015; Sörum and Gianneschi, 2023) or investigate the consumers' perceived benefits and costs of SPSS (Akbar and Hoffmann, 2018, 2020; Armstrong et al., 2015)). Additionally, some have analysed the main motivations and barriers to adopting a specific use-oriented offer, such as cell phones leasing (Hobson et al., 2018; Mashhadi et al., 2019; Poppelaars et al., 2018; Rousseau, 2020) or shared mobility (Burghard and Dütschke, 2019; Hartl et al., 2018; Mattia et al., 2019; Prieto et al., 2017).

While previous studies have effectively identified significant drivers and barriers (D&B) for the adoption of SPSS within specific areas of need,[1] they have rarely explored the extent to which these D&B vary across different areas of need or product types (Baumeister and Wangenheim, 2014; Muylaert et al., 2022; Tunn et al., 2021b). Therefore, it appears relevant to conduct a cross-area analysis of these D&B in SPSS adoption to comprehensively understand their potential variations across various areas of need. This will offer valuable insights for defining and implementing effective strategies that accommodate to diverse areas.

This study aims to address this research gap by quantitatively analysing empirical data collected during a research project conducted in the Brussels Region (Belgium) from January 2020 to December 2021. Specifically, the central research question guiding this article is: *To what extent do the drivers and barriers influencing Brussels consumers' intention to adopt SPSS differ across three distinct areas of need—namely, mobility, clothing, and tooling?* Understanding the varying significance of these D&B between areas of need can provide valuable guidance for SPSS entrepreneurs in optimizing their offers, thus further supporting their efforts to enable more sustainable consumers' practice. Our research comprises two phases: the first phase seeks to validate and corroborate findings from prior literature regarding consumers' D&B in SPSS adoption, while the second phase adopts an exploratory approach to examine how these D&B factors diverge across different areas of need.

2. Background

In this section, we start by reviewing D&B to SPSS adoption as documented in academic literature. Then, we explore variations in the importance of these factors across different areas of need. Focusing on sustainability, we emphasize D&B specific to SPSS, while acknowledging their relevance to PSS in general.

2.1. Drivers and barriers to consumers' SPSS adoption

Research into the D&B to the adoption of SPSS has been extensive, encompassing both the supply side (e.g., Pacheco et al., 2019; Vezzoli et al., 2015) and the demand side (e.g., Borg et al., 2020; D'Agostin et al., 2020; Tunn et al., 2021b). In this study, we specifically concentrate on the demand-side factors influencing SPSS adoption.

Drawing from the existing literature, we have identified D&B that play a crucial role in shaping consumers' intentions to adopt SPSS. An overview of these D&B suggests that they can be classified into four distinct categories: (1) cognitive, (2) attitudinal, (3) comparative, and (4) emotional D&B, as illustrated in Fig. 1. We provide a detailed exposition of these categories and their constituent components below.

2.1.1. Cognitive drivers and barriers

Cognitive D&B relate to mental factors that either support or hinder an individual's readiness to embrace an SPSS offer. Research by Catulli (2012), Edbring et al. (2016), and Tunn et al. (2021a) highlights the significance of cognitive barriers in SPSS adoption, indicating that a clear understanding of the value and benefits of SPSS offers can positively influence consumer adoption. Key to overcoming these barriers is effective communication to increase potential consumers' familiarity with SPSS (Borg et al., 2020). Lack of familiarity with SPSS often results in difficulty seeing its value and fitting it into existing consumption habits, leading to consumer uncertainty and scepticism. This unfamiliarity underlines the need for proactive educational efforts to boost consumer awareness and understanding of SPSS operations, features, and benefits. Thus, we assume that.

H1. A consumer who has already heard of the SPSS value proposition is more likely to subscribe to the SPSS offer.

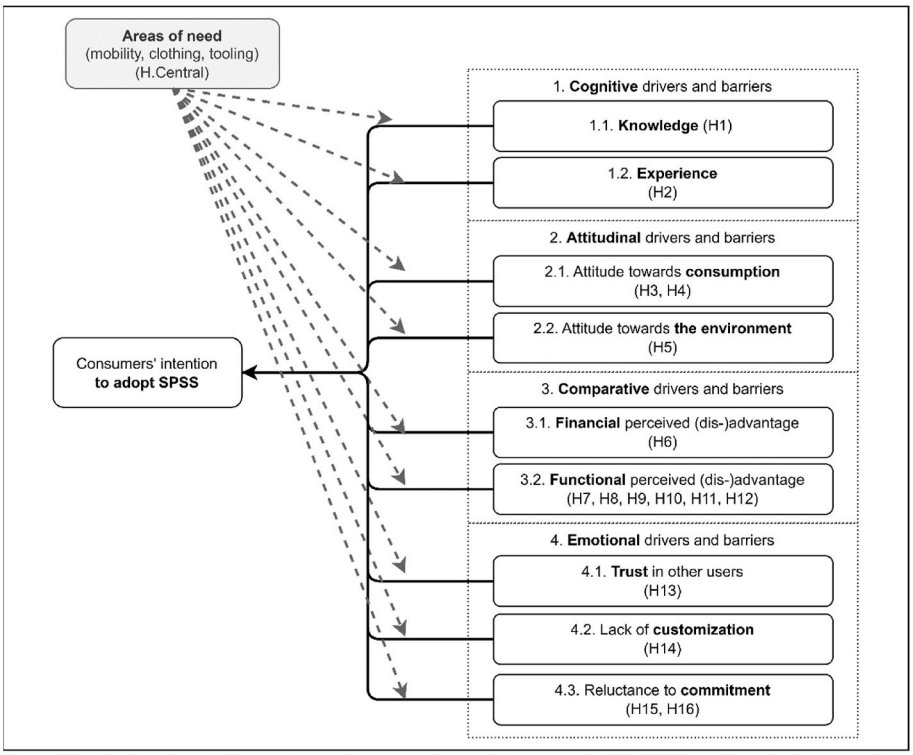
H2. A consumer who has already experienced the SPSS mechanism is more likely to subscribe to the SPSS offer.

2.1.2. Attitudinal drivers and barriers

Attitudes, which relate to individuals' evaluative judgments and beliefs towards a specific object or concept, such as SPSS, can hinder or foster consumers' SPSS adoption (Becker-Leifhold, 2018; Borg et al., 2020; Piscicelli et al., 2015; Sörum and Gianneschi, 2023). Here, we distinguish between attitude towards consumption and attitude towards the environment.

2.1.2.1. Attitude toward consumption. To grasp the influence of attitudes towards consumption on SPSS adoption, we differentiate between consumerism and materialism, two closely related yet distinct concepts. Richins and Dawson (1992) approach consumerism through the significance of acquiring material goods for individuals. SPSS, with their focus on access and shared resources, challenge the traditional notion of purchase and thus, consumerist values associated with the act of acquiring and possessing of new objects (Catulli, 2012; Edbring et al.,

[1] As explained in Ruwet et al. (2023), we use the concept of "area of need" based on Manfred Max-Neef's basic human needs approach (Max-Neef, 1992) and on the functional area, defined as "an area where new integrated solutions can be conceived, produced and implemented" (ADEME et al., 2017, p. 32). The concept of "area of need" is not clearly defined in the literature, but we do consider it broadens the notion of "sector", whether understood in terms of the different classes of economic activity (NACE codes) or in terms of the economic sectors traditionally used by the information media (e.g., building, transport, agri-food industry, energy, etc.). Focusing on "areas of need" seems to us to be more consistent with the SPSS model which, in its DNA, is dedicated to *satisfying needs* (housing, mobility, DIY, clothing, etc.) rather than to *producing goods*.



Notes. The black colour indicates the confirmatory phase of the research (H1-H16 hypotheses), the grey colour indicates the exploratory phase of the research (H.Central hypothesis).

Fig. 1. Theoretical model.
Notes. The black colour indicates the confirmatory phase of the research (H1-H16 hypotheses), the grey colour indicates the exploratory phase of the research (H. Central hypothesis).

2016; Rousseau, 2020; Tunn et al., 2021a, 2021b). Consequently, individuals strongly aligned with consumerist attitudes may be resistant to the idea of giving up the act of purchase for opting for shared or access-based services. This shift from purchase to access can be perceived as a loss of hedonic value experience or a reduction in social status (Bardhi and Eckhardt, 2012; Becker-Leifhold, 2018; Khitous et al., 2022). Thus, we assume that.

H3. The more consumers adhere to consumerist attitudes, the less likely they are to subscribe to the SPSS offer.

Materialism, defined as valuing ownership of one's possessions (Burroughs and Rindfleisch, 2002), can also act as an attitudinal barrier to consumers adopting SPSS, motivated either by sustainability concerns (following the idea of "care of things") (Denis and Pontille, 2015; Schor, 2013) or factors like personal satisfaction, social status, and self-identity (Richins and Dawson, 1992). The materialistic emphasis on owning goods conflicts with the SPSS model, which prioritizes service utilization over product ownership (Akbar et al., 2016; Akbar and Hoffmann, 2020; Intlekofer et al., 2010; Mont, 2002; Tukker, 2015). This conflict may deter those with high materialistic values from SPSS, as it challenges their association of ownership with sustainability (as a way to tackle single-use practices) or personal value. Yet, materialists might embrace SPSS, for instance when it can satisfy their desire for ever new products (Akbar et al., 2016). Overall, we follow the most commonly established evidence and assume that.

H4. The more consumers adhere to materialist attitudes, the less likely they are to subscribe to the SPSS offer.

2.1.2.2. Attitude toward the environment. As individuals become more aware of environmental issues and the ecological impact of their consumption patterns, they display a growing desire to adopt more sustainable practices. SPSS, with their focus on sharing, access, and resource optimization, align closely with environmental concerns. As such, consumers who prioritize environmental sustainability are drawn to SPSS as a mean to reduce resource consumption, minimize waste, and lower their ecological footprint (Akbar and Hoffmann, 2018; Armstrong et al., 2015; D'Agostin et al., 2020; Khitous et al., 2022). By adopting SPSS, individuals can prolong the lifecycle of products, and promote a more sustainable and efficient use of resources. Thus, we assume that.

H5. The more consumers are concerned with sustainability, the more likely they are to subscribe to the SPSS offer.

2.1.3. Comparative drivers and barriers

Comparative D&B are factors that influence consumers' adoption of SPSS through comparing them with alternative options, such as ownership-based models. When consumers perceive the alternative options as more advantageous on the financial or functional aspects, they favour the alternative option at the expense of the SPSS option (e.g., Verleye, 2015, 2014).

2.1.3.1. Financial advantage. Financial considerations can act simultaneously as a comparative barrier and a driver to consumers' adoption of SPSS, depending on the specific circumstances and the financial value consumers derive from the purchase and SPSS options (Sweeney and Soutar, 2001). To understand this, it is essential to distinguish between purchase price and total possession costs—the latter including all expenses associated with owning and maintaining a product or service over time. As a comparative barrier, upfront costs like membership or subscription fees may make SPSS seem less appealing compared to one-time product purchases, especially for those prioritizing immediate financial savings or having limited financial resources (Tunn et al., 2021a). Conversely, as a comparative driver, consumers evaluating long-term benefits may find SPSS financially advantageous due to savings on maintenance and product depreciation. This long-term

cost-effectiveness can attract consumers interested in financial sustainability and value-oriented consumption, helping SPSS providers to convert cost-conscious individuals by highlighting the savings on possession costs and long-term financial advantages (Borg et al., 2020; D'Agostin et al., 2020; Edbring et al., 2016; Rexfelt and Hiort af Ornäs, 2009). Overall, we assume that.

H6. The more consumers perceive a financial advantage in the SPSS offer, the more likely they are to subscribe to the SPSS offer.

2.1.3.2. Functional advantage. The concept of SPSS functional advantage encompasses the tangible benefits perceived by consumers in SPSS compared to the conventional ownership-based model. This includes aspects such as the perceived quality and expected performance of the SPSS offers (Sweeney and Soutar, 2001). However, functional advantage can play a dual role, acting both as a driving force for adoption and a potential barrier. Tunn et al. (2021a) documented that many factors influencing adoption of SPSS are linked to the perceived functional (dis) advantages of SPSS in comparison to available alternatives. This explains why a substantial portion of our hypotheses falls within this category.

The SPSS value proposition is based on a sharing mechanism which may involve practical and logistical issues for consumers, as with the withdrawal and return of the product and its availability (Baumeister and Wangenheim, 2014; Camacho-Otero et al., 2019; Catulli, 2012; Tunn et al., 2021b). As a comparative barrier, consumers may perceive individual product ownership as more convenient and comfortable than engaging with SPSS offers. Thus, we assume that.

H7. The more consumers perceive the item's withdrawal and return as cumbersome, the less likely they are to subscribe to the SPSS offer.

H8. The more consumers perceive the risk of unavailability of the item covered by the SPSS offer as cumbersome, the less likely they are to subscribe to the SPSS offer.

However, functional advantage can also act as a comparative driver for SPSS adoption by offering enhanced convenience, flexibility, and access to a broader range of products and services of potentially higher quality. Through SPSS, consumers gain access to a variety of support services, such as the (1) maintenance, (2) cleanliness and repair or (3) storage services, that may be logistically challenging to obtain individually (Baumeister and Wangenheim, 2014; Camacho-Otero et al., 2019; D'Agostin et al., 2020; Tunn et al., 2021a). Additionally, SPSS offers can provide a wider selection of options, allowing consumers to meet their diverse needs and preferences of (4) quality standards more effectively (Camacho-Otero et al., 2019; Catulli, 2012; Tunn et al., 2021b). By showcasing these functional advantages, SPSS providers can overcome comparative barriers and demonstrate the SPSS's added value and enhanced functionality. Thus, we assume that.

H9. The more consumers perceive that the SPSS offer enables them to avoid maintenance worries, the more likely they are to subscribe to the SPSS offer.

H10. The more consumers value the cleanliness and repair service offered by the SPSS company, the more likely they are to subscribe to the SPSS offer.

H11. The more consumers perceive the storage of the item covered by the offer as cumbersome, the more likely they are to subscribe to the SPSS offer.

H12. The more consumers perceive a quality advantage in terms of the good durability in the SPSS offer, the more likely they are to subscribe to the SPSS offer.

2.1.4. Emotional drivers and barriers

When confronted with an SPSS solution, consumers may develop positive or negative emotional responses influencing their adoption of the offer. These emotional responses may stem from concerns like the lack of trust in the users' community, or the restricted customization options, and the commitment required with a specific SPSS company.

2.1.4.1. Trust in other users. Trust is a crucial emotional factor that influences individuals' willingness to engage in shared experiences and to rely on others within the SPSS context (Akbar and Hoffmann, 2018; Armstrong et al., 2015; Bardhi and Eckhardt, 2012; Catulli, 2012; Tunn et al., 2021b). The lack of trust in other users can stem from concerns about the misuse or mishandling of shared products, unreliable behaviour, or the potential for negative experiences (such as renting a contaminated object, as evidenced by Hazée et al. (2019)). The fear of encountering untrustworthy users or experiencing negative interactions (such as delaying the return of the objects without notification) can create emotional barriers. Thus, we assume that.

H13. The more consumers trust other users to use the item carefully, the more likely they are to subscribe to the SPSS offer.

2.1.4.2. Lack of customization. The absence of customization options within SPSS can present a significant barrier (Armstrong et al., 2015; Edbring et al., 2016; Tunn et al., 2021b; Vezzoli et al., 2015). In today's consumer landscape, individuals often seek personalized experiences and products tailored to their unique preferences. When SPSS offers lack customization options, consumers may perceive a disconnect between their specific needs and the standardized service. Thus, we assume that.

H14. The more consumers perceive the impossibility of customizing the item used through the offer as cumbersome, the less likely they are to subscribe to the SPSS offer.

2.1.4.3. Reluctance to commitment. Similarly, the subscription system necessary for the development of SPSS offers may be a source of reluctance for consumers as they become committed with one SPSS offer. While subscription-based pricing offers can be seen as beneficial as they entail predictable costs, they can also be perceived as a barrier for consumers' SPSS adoption on several accounts (Poppelaars et al., 2018; Rexfelt and Hiort af Ornäs, 2009; Tunn et al., 2021b). First, consumers may feel locked into long-term commitments, especially if they are uncertain about their future needs or preferences. The idea of recurring payments and ongoing obligations can create hesitancy and a sense of loss of control over their financial resources. Second, consumers may compare subscription costs to one-time purchases and perceive them as less cost-effective, particularly if they do not anticipate frequent or extensive use of the SPSS. Lastly, subscription fatigue can play a role, as consumers may have subscribed to multiple services already and hesitate to add another ongoing expense. Thus, we assume that.

H15. The more consumers perceive the long-term commitment with the SPSS company as cumbersome, the less likely they are to subscribe to the SPSS offer.

H16. The more consumers dislike subscription systems, the less likely they are to subscribe to the SPSS offer.

2.2. The effect of the areas of need on drivers and barriers to consumers' SPSS adoption

Considering factors related to specific areas of need[1]—understood as domains where integrated solutions can be developed to meet basic human requirements, such as housing, mobility, clothing, or caregiving—is crucial when formulating strategies to promote SPSS adoption. This approach enables tailoring communication, addressing barriers specific to different areas of need, and emphasizing drivers relevant to each area of need or product type (Bardhi and Eckhardt, 2012; Baumeister and Wangenheim, 2014; Muylaert et al., 2022;

Schrader, 1999; Tunn et al., 2021b). By doing so, consumer concerns can be effectively addressed, relevant benefits can be highlighted, and the likelihood of successful adoption and market penetration can be increased. Despite the wealth of literature identifying various D&B to SPSS adoption, research focusing on their variation across areas of need is relatively limited and inconclusive, warranting an exploratory approach for investigating this issue. We review each of the D&B distinguished in the previous section, justifying why it is reasonable to suggest their significance and importance vary across areas of need.

First, consumers' familiarity with the SPSS concept, including their knowledge (H1) or experience (H2) with the SPSS business model, may differ among areas of need, and may range from comprehensive to limited. To take just one example, shared mobility (notably self-service bikes and cars) is now sufficiently widespread in major cities for many people to be at least a little familiar with it.

Second, the significance of attitudes can vary across areas of need, exerting distinct influences on consumer practices. Consequently, factors like consumerism (H3), materialism (H4), or environmental consciousness (H5) may impact the D&B to SPSS adoption differently in specific areas of need. For instance, areas of need characterized by acute sustainability issues—such as the material-intensive clothing industry (Armstrong et al., 2015)—might encounter unique D&B associated with consumers' attitudes.

Third, consumers' perception of the value and advantages of SPSS, particularly in contrast to traditional ownership models, can serve as a driving force for adoption. Entrepreneurs within areas of need that effectively communicate the financial comparative advantages (H6) or functional benefits of their SPSS (H7-H12) are likely to witness higher adoption rates. Conversely, if consumers perceive the value and benefits of SPSS as limited or ambiguous, they may exhibit reluctance to adopt it. Areas of need with less perceived value or less evident benefits may also encounter barriers to adoption.

Fourth, emotional D&B can vary across areas of need due to their specific characteristics and consumers' perceptions. In areas of need where SPSS involve safety issues—such as mobility, the fear of untrustworthy users may be more pronounced (H13), acting as a significant emotional barrier. Similarly, the importance given to the restricted personalization possibility (H14) can vary across areas of need, as some areas may emphasize personalization and customization—such as the clothing area of need, while others prioritize convenience and efficiency. Finally, reluctance to commit (H15-H16) can be influenced by factors like the perceived financial risk and the degree of long-term engagement required, which may differ across various spheres of needs.

Overall, we posit the following central assumption:

H.Central. The importance of drivers and barriers to consumers' SPSS adoption varies across areas of need.

A summary of the hypotheses is available in Table 1.

3. Material and methods

This section provides a comprehensive explanation of the questionnaire development, encompassing the measures employed in this quantitative study and the sample collection procedure. It also details the statistical analysis performed.

3.1. Questionnaire development

During the last semester of 2021, we conducted a self-administered online survey among Brussels inhabitants to investigate the variation of D&B across areas of need. For this purpose, we selected three contrasting areas of need—mobility, clothing, and tooling—based on three main criteria: (1) broad relevance to the surveyed population, ensuring the offers are meaningful to a wide range of people regardless of life stage (e.g., pregnancy), gender, socioeconomic status, cultural background, or location, (2) fulfilment of diverse needs, and (3) support from existing empirical research. While practical considerations, such as existing SPSS offers in Brussels, partly influenced our choice, these areas are also well-established in SPSS research. Therefore, we focused on areas that are both highly relevant to the SPSS research community and the Brussels population, ensuring a more substantive and informed discussion.

To ensure broad applicability and tangibility, we developed fictitious SPSS offers, presented through three vignettes (see Appendix A), suitable for a diverse audience, excluding offers tailored to specific certain life stages or population segments. The features of these fictitious SPSS offers were intentionally designed to be universally accessible, transcending gender, social status, income, cultural variations, and geographic locations. These offers drew inspiration from real-world SPSS solutions,[2] ensuring practicality while aligning with sustainability principles (Roman et al., 2023). We strived to maintain uniformity in these fictitious SPSS offers across areas of need. Regardless of the area of need, the three fictitious vignettes uniformly highlight the sustainability of their offer through a clearly stated sustainable-oriented philosophy, endorse a membership-based financial model, and ensure the provision of high-quality, environmentally friendly and long-lasting products. Similarly, each offer allows for a relatively unlimited frequency and/or quantity of product rentals, includes repair, cleaning, and maintenance services, enables online booking, and supports convenient local pickup and return options. The survey was conducted in the Brussels Region due to its well-developed SPSS market, providing ample exposure to such offers (Ruwet et al., 2023). Let us note that, while this high exposure may enhance respondents' familiarity with SPSS, it could also lead to an overestimation of their adoption intentions compared to individuals in less urban regions, where SPSS options are less prevalent, and consumers may have different experiences and perceptions. Each respondent was presented with a specific area of need vignette according to their date of birth, ensuring random distribution of the areas of need.

Adoption of SPSS was measured thanks to one item, a Likert scale for respondents to express their intention to subscribe to the fictitious SPSS offer presented in the vignette if it existed. Individual D&B, except for attitudinal ones, were measured by one single item and they have been constructed specifically for this survey. To measure attitudinal D&B (i.e., consumerism, materialism and environmental concerns), we followed recommendations by Heggestad et al. (2019) to adapt (see Appendix B) the following existing scales to our context: the consumerism and the materialism scale of Richins and Dawson (1992) and the environmental concerns measure of Diekmann and Preisendörfer (2003). Table 1 summarizes the independent and dependent variables used in our survey. We have also collected socio-demographic information to include in our statistical analysis the following four control variables: age, gender, education, and net monthly income.

Respondents were selected using a nonprobability sampling method. While this method limits the generalizability of results (see Appendix C for a comparison with the Brussels population), it is often necessary when time, budget, and resource constraints make probabilistic sampling impractical (Hair et al., 2024). The survey was distributed mainly online in French, Dutch and English[3] through several channels: social networks (LinkedIn and Facebook) and educational and professional networks (such as circlemade.brussels of hub.brussels[4] and ICHEC

[2] The fictitious vignettes were inspired by (once-)existing SPSS offers in Brussels: TaleMe, Coucou and Jukebox for the clothing offer, Usitoo and Tournevie for the tooling offer, and various instances of Mobility as a service (MaaS) offers including public transportation as well as Cambio and Poppy for the mobility offer.

[3] The survey translation, a joint effort by the authors team, was refined by a linguist.

[4] Circlemade.brussels is the network of circular manufacturing companies created by hub.brussels, the brussels public Agency promoting and encouraging business in shifting towards a more independent, sustainable and accessible economy.

Table 1
Hypotheses and variables summary.

Category			Label	Survey item	Hypothesis number	Expected sign
DV			Subscription intention	If this offer really existed, I would subscribe to it.		
IV	Cognitive D&B	Knowledge	Heard of SPSS business model	I have already heard of this type of offer, in this sphere of needs or in others.	H1	+
		Experience	Experienced SPSS business model	I have already tested this type of offer, in this sphere of needs or in others.	H2	+
	Attitudinal D&B	Towards consumption	Consumerism	Multi-item scale.	H3	–
			Materialism	Multi-item scale.	H4	–
		Towards the environment	Environmental concerns	Multi-item scale.	H5	+
	Comparative D&B	Financial perceived (dis-)advantage	Financial advantage	I see a financial advantage in this offer compared to buying a new item.	H6	+
		Functional perceived (dis-)advantage	Withdrawal and return cumbersome	For me, the management of the withdrawal and return of items is cumbersome.	H7	–
			Items unavailability	I am afraid that the item I need will not be available when I want to rent it.	H8	–
			No maintenance worries	I like the fact that the maintenance of the items is taken care of by the service company. This way I don't have to worry about anything.	H9	+
			Cleanliness and safety	I appreciate the fact that the service provider manages the cleaning and repair of the items, which guarantees its cleanliness and safety.	H10	+
			Space saving	With this offer, I appreciate not accumulating items in my storage.	H11	+
			High quality items	This offer would give me access to high quality items.	H12	+
	Emotional D&B	Trust in other users	Trust	I trust that others will take care of the items.	H13	+
		Lack of customization	Customization	Since I don't own the item, I can't customize it the way I want, which I don't like.	H14	–
		Reluctance to commitment	Long-term commitment dislike	I don't like to make a long-term commitment to the company providing the service.	H15	–
			Subscription dislike	I find it annoying to be forced to pay a fixed monthly fee for renting items, regardless of how I use the service.	H16	–
Importance of drivers and barriers to consumers' SPSS adoption vary across areas of needs.					H.Central	Exploratory

Notes. DV: Dependent variable. IV: Independent variable.

Brussels Management School[5]). We complemented the online sample with the assistance of a survey company (Dedicated[6]). We also distributed flyers in the streets and mailboxes of Brussels in specific areas. To provide a clear understanding of the methodological approach, Fig. 2 presents a graphical representation of the questionnaire structure.

3.2. Sample

After cleaning the dataset (initial number of observations: 1192) by removing inconsistent or incomplete answers and replacing some missing data following the recommendations of Tsikriktsis (2005) [7] (number of observations dropped: 121, 119, and 136 respectively for Mobility, Clothing, and Tooling), the final sample size is 816, distributed among the three areas of need as follows: 255, 265, and 296, respectively for Mobility, Clothing, and Tooling. This processed database is available on Mendeley Data (Dethier et al., 2023). Table 2 presents descriptive statistics and correlations for the entire sample and each sub-sample based on the selected three areas of need.

As expected, due to the randomized attribution of area-of-needs vignettes to respondents, a one-way ANOVA test confirms no statistical differences in control variables (i.e., the four socio-demographics variables) among the three sub-samples. This contrasts with the independent variable ("Subscription intention") and the other dependent variables. However, it was anticipated that attitude variables (i.e., consumerism, materialism, and environmental concerns) would exhibit no statistical differences across sub-samples, given that these are inherent personality traits assessed prior to the introduction of the vignette. The reasons for these differences across sub-samples are not readily apparent but are believed not to be worrisome, given their small intensity (largest difference in mean attitudinal variables across area sub-samples is .99).

3.3. The structural model

To test our central assumption (H.Central) that D&B in SPSS adoption intention vary across areas of need, we conduct multigroup ordinary least square (OLS) regression analyses. This involves running separate OLS regressions for both the overall sample and each sub-sample and subsequently comparing the significance and strength of OLS coefficients across sub-samples. OLS regression is chosen due to the Likert scale nature of the dependent variable, allowing us to evaluate how individual D&B factors influence the *degree* of intention to adopt

[5] ICHEC Brussels Management School is a Brussels-based management school offering university-level management training programs.

[6] Dedicated is a private Belgian company offering tailor-made research and polling solutions.

[7] To handle socio-demographic control variables, we initially removed observations with a minimum of 2 missing data (1 observation dropped). Subsequently, we identified that the missing data for these variables were not missing completely at random, suggesting the potential use of hot-deck imputation (Little and Rubin, 2019). For continuous variables (e.g., "age"), we substituted missing data with the mean, while for categorical data (e.g., "education" and "net monthly income"), we employed the mode, based on the responses of individuals within the same professional category. The "professional category" variable, although not used as a control variable in our model to mitigate multicollinearity, takes the following values: 1 = Student, 2 = Employee, 3 = Self-employed, 4 = Unemployed, 5 = (pre)retired, and 6 = other (stay-at-home parent). Regarding independent and dependent variables, observations with at least 1 missing data were removed (resulting in the removal of 12, 1, and 19 observations for Mobility, Clothing, and Tooling, respectively), as these missing data were determined to be missing completely at random.

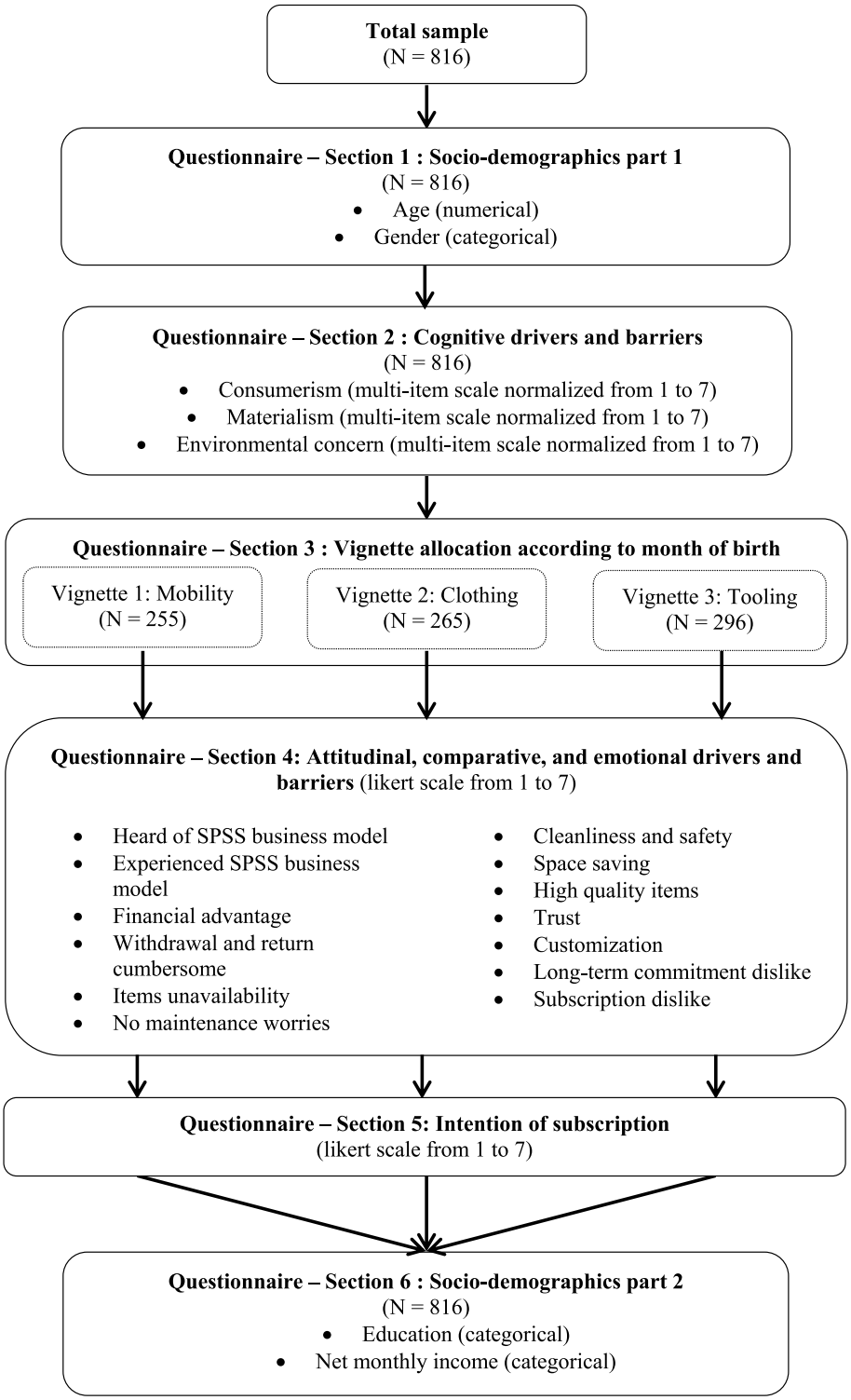


Fig. 2. Questionnaire structure.

SPSS, while also examining the impact of areas of need on these factors.

4. Results

Table 3 displays the results of eight OLS regressions, four without socio-demographic control variables (Model 1) and four with socio-demographic control variables (Model 2).

We assess multicollinearity among independent and control variables using variance inflation factors (VIF). In Model 1, the mean VIFs range from 1.55 to 1.76 across areas of need sub-samples, with no variable exceeding VIFs of 2.45–2.81. In Model 2, mean VIFs range from 1.52 to 1.81 across areas of need sub-samples, with no variable exceeding VIFs of 2.40–3.41. These findings ensure that multicollinearity issues are avoided in both Models 1 and 2 (Wooldridge, 2015). Subsequent sections delve into regression results, first providing a general overview and then examining results across sub-samples.

Table 2
Descriptive statistics and correlations.

Variable		Mean[g]				S. d.				Correlation with DV[h]			
		Overall	Mobility	Clothing	Tooling	*Overall*	Mobility	Clothing	Tooling	*Overall*	Mobility	Clothing	Tooling
DV	Subscription intention[a]	*3.41*	3.62	3.00	3.60	*1.88*	2.05	1.84	1.71				
IV	1. Heard of SPSS business model[a]	*3.46*	4.13	3.19	3.11	*2.16*	2.15	2.21	1.98	*.25*	.32	.19	.23
	2. Experienced SPSS business model[a]	*2.50*	3.18	2.17	2.21	*1.92*	2.16	1.77	1.68	*.38*	.52	.37	.18
	3. Consumerism[b]	*4.35*	4.41	4.66	4.02	*1.31*	1.50	1.13	1.20	*.15*	.35	−.01	.12
	4. Materialism[b]	*3.49*	3.02	4.01	3.43	*1.22*	1.18	1.20	1.07	*−.16*	−.10	−.11	−.17
	5. Environmental concerns[b]	*5.03*	5.08	5.13	4.90	*1.32*	1.38	1.27	1.32	*.25*	.29	.25	.25
	6. Financial advantage[a]	*4.39*	4.55	3.79	4.78	*1.80*	1.67	1.97	1.60	*.45*	.41	.47	.42
	7. Withdrawal and return cumbersome[a]	*4.53*	4.53	4.94	4.17	*1.71*	1.69	1.70	1.65	*−.06*	.23	−.22	−.14
	8. Items unavailability[a]	*4.86*	5.02	4.71	4.86	*1.70*	1.81	1.72	1.56	*.10*	.12	.12	.02
	9. No maintenance worries[a]	*5.39*	5.35	5.12	5.67	*1.61*	1.62	1.74	1.42	*.23*	.15	.27	.25
	10. Cleanliness and safety[a]	*5.43*	5.28	5.29	5.69	*1.67*	1.66	1.78	1.53	*.23*	.19	.22	.26
	11. Space saving[a]	*4.61*	4.66	4.18	4.96	*1.78*	1.76	1.83	1.69	*.42*	.40	.42	.40
	12. High quality items[a]	*4.79*	4.84	4.50	5.02	*1.67*	1.56	1.85	1.55	*.44*	.46	.43	.42
	13. Trust in other users[a]	*3.56*	3.77	3.36	3.56	*1.78*	1.75	1.85	1.73	*.47*	.53	.50	.37
	14. Customization[a]	*3.86*	4.08	4.07	3.48	*1.97*	1.99	2.00	1.87	*.01*	.19	−.05	−.09
	15. Long-term commitment dislike[a]	*4.36*	4.36	4.58	4.17	*1.73*	1.63	1.89	1.66	*−.07*	.16	−.19	−.14
	16. Subscription dislike[a]	*4.90*	4.60	5.32	4.79	*1.78*	1.71	1.70	1.84	*−.21*	.01	−.31	−.28
Control	Age[c]	*39.11*	39.48	38.06	39.73	*18.56*	17.02	17.98	20.28	*.25*	−.09	−.13	−.11
	Gender[d]	*.49*	.48	.49	.50	*.50*	.50	.50	.50	*.38*	−.09	−.02	.17
	Education – 1[e]	*.04*	.07	.03	.03	*.01*	.02	.01	.01	*−.01*	−.11	−.02	.11
	Education – 2[e]	*.09*	.13	.07	.08	*.01*	.02	.02	.02				
	Education – 3[e]	*.37*	.31	.44	.36	*.02*	.03	.03	.03				
	Education – 4[e]	*.23*	.22	.23	.23	*.01*	.03	.03	.02				
	Education – 5[e]	*.27*	.27	.24	.30	*.02*	.03	.03	.03				
	Net monthly income – 1[f]	*.12*	.10	.12	.13	*.01*	.02	.02	.02	*.11*	.29	−.04	0.07
	Net monthly income – 2[f]	*.23*	.23	.21	.25	*.01*	.03	.02	.03				
	Net monthly income – 3[f]	*.26*	.22	.32	.23	*.02*	.03	.03	.02				
	Net monthly income – 4[f]	*.16*	.16	.15	.16	*.01*	.02	.02	.02				
	Net monthly income – 5[f]	*.12*	.18	.09	.10	*.01*	.02	.02	.02				
	Net monthly income – 6[f]	*.05*	.04	.04	.05	*.01*	.01	.01	.01				
	Net monthly income – 7[f]	*.07*	.06	.08	.07	*.01*	.02	.02	.02				

Notes. DV: Dependent variable. IV: Independent variable. S. d.: Standard deviation.
[a] Likert scale from 1 to 7 (Disagree – Agree).
[b] Multi-item scale normalized from 1 to 7 (Low – High).
[c] Years.
[d] 0 = Male/1 = Female.
[e] 1 = Primary school/2 = Junior high school/3 = Senior high school/4 = Bachelor's degree/5 = Master's degree.
[f] 1 = [0 €; 1000 € [/2 = [1000 €; 2000 € [/3 = [2000 €; 3000 € [/4 = [3000 €; 4000 € [/5 = [4000 €; 5000 € [/6 = [5000 €; 6000 € [/7 = [6000 €; ∞.
[g] For categorical variables (i.e., Gender, Education and Net Monthly income), the proportion of each category is reported instead of the mean.
[h] For continuous and binary variables, we used the Pearson correlation, while the Spearman correlation was applied to ordinal variables.

4.1. Results in general

With significance levels of the coefficient equal to or below 5% for both Model 1 and Model 2, our results confirm eight hypotheses (H2, H5, H6, H11, H12, H13, H15, and H16) when not distinguishing by areas of need, indicating that the remaining eight D&B hypotheses from the literature (H1, H3, H4, H7, H8, H9, H10, and H14) do not significantly influence consumer intention to adopt SPSS on a general basis (see the two columns "Overall" of Table 3).

Cognitive D&B regarding SPSS knowledge (H1) does not seem to explain adoption intention variation, while practical experience (H2) does significantly reduce the likelihood of SPSS offer adoption intention. Among attitudinal factors, only "environmental concerns" (H5) discriminate between consumers, with attitudes toward consumption (H3 and H4) having no significant impact. "Financial advantage" (H6) drives adoption, while functional factors (H7-H10) mostly do not, except for "storage space savings" (H11) and "higher item quality" (H12). Emotional factors, like "trust in other users" (H13) and "long-term commitment" (H15) enhanced by subscription format (H16), significantly differentiate consumers. However, object customization (H14) has limited influence on adoption intention.

The non-significance of a D&B suggests it does not effectively differentiate between potential SPSS adopters and non-adopters based on their intentions. In other words, if both groups share similar views on a specific D&B, its coefficient becomes insignificant.

Some previously relevant D&B may not appear significant due to our comprehensive approach, where we consider numerous D&B simultaneously and address multicollinearity concerns. This ensures each coefficient represents a specific D&B unique effect on SPSS adoption intention. Furthermore, the non-significance of certain D&B, initially considered relevant, could be attributed to study-specific factors like the survey context and the inclusion of three distinct areas of need. While two D&B (H7 and H8) appear overall insignificant, further analysis reveals their significance when considering specific areas of need. This emphasizes the importance of accounting for the area of need when assessing individual D&B significance. Our detailed findings in the next section clarify that without distinguishing between areas of need, significant effects might be concealed by other insignificant ones.

Table 3
Results from OLS regressions.

Variable (expected sign)		Model 1												Model 2											
		Overall			Mobility			Clothing			Tooling			*Overall*			Mobility			Clothing			Tooling		
		β	*t*	*p*	β	t	p	β	t	p	β	t	p	*β*	*t*	*p*	β	t	p	β	t	p	β	t	p
IV	1. Heard of SPSS business model (+)	*.02*	*.68*		.03	.47		−.02	−.48		.09	1.86		*.02*	*.63*		.02	.37		−.01	−.32		.09	1.85	
	2. Experienced SPSS business model (+)	*.19*	*5.25*	***	.24	3.33	*	.23	3.87	***	.09	1.56		*.19*	*5.12*	***	.24	3.26	***	.21	3.31	***	.08	1.39	
	3. Consumerism (−)	*.09*	*2.10*	*	.06	.82		−.05	−.58		.18	2.66	**	*.08*	*1.79*		.03	.39		−.07	−.77		.18	2.44	*
	4. Materialism (−)	*.02*	*.33*		.11	1.04		−.02	−.23		−.09	−1.05		*.01*	*.30*		.11	1.10		−.03	−.47		−.10	−1.08	
	5. Environmental concerns (+)	*.13*	*2.70*	**	.20	2.16	*	.17	2.04	*	.05	.70		*.13*	*2.83*	**	.21	2.31	*	.19	2.21	*	.03	.50	
	6. Financial advantage (+)	*.23*	*6.16*	***	.36	4.38	***	.19	3.92	***	.22	2.70	**	*.23*	*6.12*	***	.34	4.10	***	.18	3.60	***	.22	2.74	**
	7. Withdrawal and return cumbersome (−)	*−.02*	*−.59*		.17	2.43	*	−.10	−1.84		−.09	−1.44		*−.02*	*−.66*		.15	2.34	*	−.10	−1.79		−.08	−1.34	
	8. Items unavailability (−)	*.00*	*.11*		−.14	−2.02	*	.09	1.63		.02	.35		*.00*	*.02*		−.16	−2.19	*	.09	1.58		.02	.22	
	9. No maintenance worries (+)	*.03*	*.53*		−.06	−.65		.00	.04		.09	.96		*.02*	*.49*		−.09	−.95		.00	.03		.09	.99	
	10. Cleanliness and safety (+)	*−.05*	*−1.02*		.02	.24		−.01	−.08		−.12	−1.25		*−.04*	*−.94*		.07	.79		−.01	−.14		−.13	−1.32	
	11. Space saving (+)	*.13*	*3.92*	***	.19	3.00	**	.06	1.23		.16	2.24	*	*.13*	*3.83*	***	.20	3.05	**	.06	1.23		.15	2.15	*
	12. High quality items (+)	*.19*	*4.88*	***	.17	1.98	*	.17	3.19	**	.19	2.32	*	*.18*	*4.76*	***	.15	1.85		.18	3.23	***	.18	2.13	*
	13. Trust in other users (+)	*.24*	*6.73*	***	.23	3.53	**	.24	3.97	***	.17	2.78	**	*.24*	*6.63*	***	.22	3.48	***	.25	4.10	***	.17	2.87	**
	14. Customization (−)	*.04*	*1.29*		.03	.49		.00	0.09		.09	1.72		*.04*	*1.20*		.04	.68		.01	.22		.09	1.79	
	15. Long-term commitment dislike (−)	*−.08*	*−2.40*	*	−.10	−1.48		−.08	−1.61		−.08	−1.40		*−.08*	*−2.36*	*	−.11	−1.74		−.06	−1.19		−.08	−1.39	
	16. Subscription dislike (−)	*−.19*	*−5.67*	***	−.18	−2.67	**	−.19	−3.06	**	−.21	−3.95	***	*−.19*	*−5.60*	***	−.19	−2.82	**	−.20	−3.13	**	−.22	−4.18	***
Constant		*−.26*	*−.69*		−1.75	−2.24	*	.88	1.24		.54	.84		*−.13*	*−.26*		−1.92	−2.10	*	1.52	1.70		.48	.50	
Control	Age													*.00*	*−.46*		.00	−.26		−.01	−1.07		.00	.11	
	Gender													*−.05*	*−.48*		−.29	−1.49		−.23	−1.26		.39	2.53	*
	Education													*−.04*	*−.87*		.01	.11		−.04	−.49		.00	.04	
	Net monthly income													*.05*	*1.79*		.18	3.21	**	−.04	−.72		.03	.60	
N		*816*			255			265			296			*816*			255			265			296		
R^2		*.48*			.54			.52			.43			*.48*			.56			.53			.44		
RME		*1.37*			1.44			1.31			1.36			*1.67*			1.41			1.31			1.32		

Notes. B: Standardized coefficients; t: t-statistic; p: p-value. Level of significance: *p ≤ .05, **p ≤ .1, ***p ≤ .001. RME: Root Mean Square Error.

4.2. Results across areas of need

Comparing OLS regression results across areas of need confirms our central assumption that certain D&B vary in significance and intensity when considering different areas.

In terms of significance, some D&B lose their significance when distinguishing between areas. For instance, "space-saving" (H11) is no longer significant in the clothing area, while "experience" (H2) and "environmental concerns" (H5) lose significance in the mobility area. Conversely, some previously insignificant D&B gain significance when analysed separately for each area. For example, "withdrawal and return" (H7) and "items unavailability" (H8) become significant in the mobility area, and "consumerism" (H3) becomes significant in the tooling area. Notably, "long-term commitment" (H15), initially significant overall, loses significance when examined separately for each area.

Intensity variations in significant coefficients are also observed. "Financial advantage" (H6), one of the most influential drivers across area of need sub-samples, has a strong impact in the mobility area, with a coefficient of .36 for Model 1 and .34 for Model 2, while it appears of a lesser magnitude in the other two sectors. In contrast, "trust in other users" (H13) shows a less pronounced effect in the tooling area, with coefficients of .17 for both Model 1 and 2,[8] than in mobility and clothing. Meanwhile, "high-quality items" (H12) and "subscription dislike" (H16), both significant across areas, exhibit consistent intensity across different areas of need.

Table 4
Drivers and barriers classification.

Driver and barrier	Generic	Irrelevant	Area-Specific		
			Mobility	Clothing	Tooling
1. Heard of SPSS business model		✓			
2. Experienced SPSS business model			✓	✓	
3. Consumerism					✓
4. Materialism		✓			
5. Environmental concerns			✓		
6. Financial advantage	✓				
7. Withdrawal and return cumbersome			✓		
8. Items unavailability			✓		
9. No maintenance worries		✓			
10. Cleanliness and safety		✓			
11. Space saving			✓		✓
12. High quality items	✓				
13. Trust in other users	✓				
14. Customization		✓			
15. Long-term commitment dislike		✓			
16. Subscription dislike	✓				

Notes. Only the area-specific D&B are assigned to the relevant area(s) of need. Generic D&B apply to all three areas, and irrelevant D&B to none of them.

5. Discussion

From the analysis of the results across areas of need (see Section 4.2), we can identify three distinct categories of D&B: generic, irrelevant, and area-specific. Generic D&B apply universally across all areas of need, although their intensity may vary. Conversely, irrelevant D&B demonstrate a consistent lack of significance across the areas considered. Finally, area-specific D&B are significant in some, but not all, areas of need, exhibiting variations in their significance depending on the particular area. Table 4 presents a comprehensive classification of these D&B categories. This differentiation not only clarifies the landscape of D&B within SPSS but also reinforces our central hypothesis (H.Central) regarding the variability of D&B significance and intensity across different areas of need.

We now seek to understand the reasons behind these variations. We focus on area-specific D&B that exhibit variations in terms of significance (H2, H3, H5, H7, H8, and H11) and on generic D&B that exhibit variations in terms of intensity (H6 and H13) across different areas. Other D&B that maintain consistent levels of significance or intensity across areas (H1, H4, H9, H10, H12, H14, H15, and H16) are not discussed further.

5.1. Specificities of the mobility area of need

The mobility area stands out with unique features compared to the other two areas. Specifically, "withdrawal and return" (H7) and "item unavailability" (H8) exhibit significance, influencing consumers' SPSS adoption intentions, but solely within the mobility area. This distinctiveness can be attributed to the importance of convenience in mobility products (e.g., cars or bikes), where flexibility and reliable availability are crucial considerations (Fishman et al., 2013; Mattia et al., 2019; Paundra et al., 2017). Mobility needs are typically *frequent or urgent*, unlike clothing and tooling needs, which may be less frequent or immediately essential. In this context, easy item withdrawal and return becomes a discriminating factor, as does reliable item availability. Failing to ensure these aspects in SPSS offers within the mobility area can hinder users' ability to access transportation promptly, potentially deterring adoption.

Furthermore, mobility needs are *time-sensitive* (de Lorimier and El-Geneidy, 2013; Paundra et al., 2017). Users often require quick access to vehicles like cars or bikes in the mobility area, making the ease of withdrawal and return critical. If SPSS offers in mobility do not provide a seamless process for these aspects, they could discourage potential users who prioritize convenience and immediacy. This perception of risk concerning limited or complicated access to a vehicle when needed is high in the mobility area, making users cautious about adopting SPSS options that may restrict access, especially during emergencies or unexpected situations.

Additionally, perceived financial advantages significantly influence consumers' SPSS adoption intentions within the mobility area (H6). This is understandable considering the *costs* associated with car or bike ownership, including upfront costs, maintenance expenses, and insurance (Burghard and Dütschke, 2019; Paundra et al., 2017; Tunn et al., 2021b). In contrast, clothing and tooling products usually involve lower ongoing costs, diminishing the perceived financial gains from SPSS in these areas.

5.2. Specificities of the clothing area of need

First, previous experiences with SPSS offers (H2) significantly impact consumers' intentions to adopt SPSS in the clothing and mobility areas, unlike in the tooling area. In the clothing area, this influence can be attributed to the substantial role of habituation, where consumption habits are more entrenched and require more leverage to change, compared to the tooling area. The unique nature of clothing consumption, falling between daily purchases (like food) and infrequent purchases (like cars), further contributes to this phenomenon (Muylaert and Maréchal, 2022).

Next, environmental concern emerges as a significant driver (H5).

[8] The observed differences in coefficient intensity, while indicative, are not statistically confirmed through tests resulting from a seemingly unrelated regression approach. Notably, a singular exception exists where the "financial advantage" coefficient in the mobility area is statistically different from its counterpart in the clothing area, with error margins set at 6% and 8% for Model 1 and Model 2, respectively. Such findings imply to interpret cautiously the intensity differences within the generic D&B analysis.

While some literature supports this finding in the clothing area (Khitous et al., 2022), there exists, to some extent, a contrasting viewpoint. Scholars have demonstrated that consumer awareness of environmental issues related to fast fashion does not consistently lead to more sustainable intentions or practices, such as second-hand purchase (Kleinhückelkotten and Neitzke, 2019), clothes-swapping with friends (Diddi and Yan, 2019; Kleinhückelkotten and Neitzke, 2019), or clothing rental (Becker-Leifhold, 2018).

Finally, the potential space-saving benefit of SPSS (H11) is not a significant driver in the clothing area, which is understandable given the nature of clothing items. Clothing items are generally *compact* and do not demand significant storage space, unlike mobility and certain tooling products. Clothing can be easily accommodated in closets or drawers, reducing the criticality of space-saving benefits in this context. In contrast, mobility and tooling products typically require more storage space. Users of these items may value the convenience of not needing to store or maintain them when not in use. However, clothing is a daily necessity that individuals are *accustomed* to managing in their living spaces. Since easy access to clothing is essential for daily routines, the storage space aspect may have a lesser impact on the decision to adopt SPSS in the clothing area.

5.3. Specificities of the tooling area of need

Previous experience with SPSS offers (H2) and environmental concerns (H5) are not significant drivers for consumers to be willing to adopt SPSS in the tooling area of need. The non-significance of these two D&B in Tooling can be attributed to the fact that consumers might prioritize *other benefits* of the SPSS, as for example the fact that SPSS is perceived to provide a functional comparative advantage of saving space.

Significance of the consumerism factor (H3) as a driver of consumers' adoption of SPSS in tooling can be explained by the fact that these products are often more technically complex and *specialized*, requiring specific tools for various tasks. Consumers in the tooling area may prioritize having access to a wide range of tools, thanks to SPSS, over owning them due to the diversity of tasks they need to perform.

Environmental concerns (H5) may not influence tooling area consumers significantly because tooling products are perceived as having a lower environmental impact. Potentially, tools are considered *durable* and infrequently replaced—especially those of high quality, reducing thus the need for sustainable alternatives. Additionally, mobility and clothing areas emphasize environmental messaging (e.g., Banister, 2008; Han et al., 2017), making consumers *aware*, to some extent, of environmental issues there. Consequently, environmental concerns might be more *salient* in the mobility and clothing areas, where consumers can directly relate their choices to broader environmental and societal issues. The connection between individual actions and environmental consequences might be more apparent in the mobility and clothing areas, influencing consumers' willingness to adopt SPSS for sustainability reasons (e.g., Armstrong et al., 2015; Mattia et al., 2019).

The lack of trust in other users (H13) is a less critical barrier in the tooling area compared to mobility and clothing areas. This is partly due to the perceived durability of tools and the less frequent use, *reducing reliance* on others' responsible behaviours. In mobility and clothing areas, potential misuse has more significant consequences, making trust in other users a stronger concern (Armstrong et al., 2015; Bardhi and Eckhardt, 2012; Catulli, 2012).

6. Conclusions

In conclusion, our study has unveiled a landscape of D&B that exert varying influences on consumers' willingness to adopt SPSS across different areas of need. We have identified three distinct categories of D&B patterns: generic, irrelevant, and area-specific (see Table 4). First, some D&B ("Financial advantage", "High quality items", "Trust", and "Subscription dislike") appear to be generic, transcending the boundaries of specific areas of need. These factors consistently impact consumers' SPSS adoption intentions, highlighting their broader relevance. Conversely, a set of D&B ("Heard of SPSS business model", "Materialism", "No maintenance worries", "Cleanliness and safety", "Customization", and "Long-term commitment dislike") remains largely insignificant regardless of the consumer context, emphasizing their negligible impact on SPSS adoption. The most intriguing findings, however, revolve around the area-specific D&B ("Experienced SPSS business model", "Consumerism", "Environmental concerns", "Withdrawal and return cumbersome", "Items unavailability", and "Space saving"). For these D&B, context is central. Familiarity with SPSS offers, consumer attitudes, and comparative factors take a central position in distinguishing adoption intentions.

In the tooling area, consumerism emerges as a potent force, intriguingly contradicting our initial assumption that consumerist attitudes would lead to lower SPSS adoption intention. This result potentially reflects the need for a wide selection of specialized tools, diminishing the appeal of ownership in the tooling area. In contrast, environmental concerns take a pivotal role in the mobility and clothing areas, where sustainability considerations dominate, eclipsing thus the influence of consumerism. Financial benefits exert a particularly significant appeal on the mobility area, attracting those seeking economical transport solutions, where SPSS adopt a central position. Conversely, owning objects in the tooling area seems more attractive financially than resorting to an SPSS offer, potentially because of tools durability. The importance of functionality also varies; in the mobility area, accessible and available solutions are critical, whereas these issues are of less significance in the clothing and tooling areas. Concerns about damage or misuse of shared items heighten trust issues in the mobility area but diminish in the tooling area, reflecting different project dynamics.

Overall, our research unravels the intricate web of D&B dynamics, offering both academic insights and practical guidance for SPSS providers and policymakers seeking to navigate the diverse consumers' landscapes across areas of need.

6.1. Academic and practical contributions

Studying the variation of D&B to SPSS adoption across areas of need yields several important academic contributions. Firstly, this study makes a significant contribution to the broader SPSS research by identifying key D&B that vary across different areas of need, a finding crucial for developing tailored research that enhance the nuance of SPSS studies. By simultaneously testing a large number of D&B (see Table 1), this research allows for the identification of the individual effects of each factor. This allows researchers to provide more detailed insights into the relative importance of each driver or barrier and to better inform targeted strategies for encouraging SPSS adoption.

Secondly, by comparing D&B across areas of need, this research highlights that each area of need follows its own dynamics. The study recognizes that consumer adoption behaviours are not homogeneous across areas of need, as the D&B influencing SPSS adoption intention from the demand side vary significantly. By selecting areas of need relevant to both the SPSS research community and the Brussels population, our study facilitates a more targeted examination of these dynamics. This enables researchers to identify specific patterns and gain a more comprehensive and accurate understanding of the factors shaping consumer practices within each area of need (Baumeister and Wangenheim, 2014; Muylaert et al., 2022; Tunn et al., 2021b). As such, this cross-area analysis enriches our understanding of SPSS adoption intentions by emphasizing the need for area-specific approaches and debunking one-size-fits-all assumptions. This comprehensive cross-area examination further refines the focus of SPSS research, redirecting attention from certain D&B (i.e., irrelevant D&B) that have traditionally received disproportionate emphasis, by highlighting their reduced significance within the complex landscape of SPSS adoption. This also

advances the (S)PSS literature by demonstrating that not all D&B are equally relevant across all areas, challenging generalizations in (S)PSS models and offering more nuanced, area-specific insights.

In addition to academic contributions, exploring the variation of D&B across areas of need provides valuable insights into market dynamics and opportunities for SPSS providers and policymakers, thus further supporting their efforts to contribute to more sustainability in consumption. The delineation of generic D&B suggests that SPSS offers should target costly-to-own products (e.g., high-end bicycles or electric vehicles) to emphasize the 'Financial advantage', highlight the high product quality of items (e.g., premium clothing brands or durable tools) to promote 'High quality items', foster users' trust by providing transparent customer reviews and reliable service (e.g., a proven track record, through customers' testimonials or performance metrics for instance, of successful service delivery), and mitigate subscription reluctance through flexible subscription models (e.g., offering trial periods or pay-as-you-go options) to address 'Subscription dislike'.

Identifying irrelevant D&B is equally important, as it reveals aspects that do not significantly impact the intention to adopt an SPSS offer. Recognizing these elements as negligible allows SPSS providers and policymakers to refine their focus, directing resources and efforts towards features with greater impact on consumers' adoption and engagement. For SPSS providers, this insight aids in streamlining offer designs and marketing strategies, avoiding overinvestment in features that do not meet consumers' priorities. For policymakers, understanding these irrelevant D&B supports the formulation of policies and initiatives that more accurately target the facilitators of SPSS adoption. As such, the identification of irrelevant D&B indicates that SPSS providers and policymakers need not focus efforts and resources on spreading information with regard to the SPSS business model ("Heard of SPSS business model"), on mitigating consumers' concerns related to limited ownership ("Materialism"), maintenance ease ("No maintenance worries"), items cleanliness and safety ("Cleanliness and safety"), customization limitations ("Customization"), and commitment flexibility ("Long-term commitment dislike") in their communication and outreach strategies. This understanding fosters a more efficient allocation of resources, enhancing the efficacy of efforts aimed at promoting sustainable consumption practices. These findings also serve as a broader contribution to the SPSS movement, as they guide stakeholders in avoiding the overprioritization of factors that do not substantially influence adoption intentions, streamlining efforts for more effective SPSS penetration.

Finally, understanding the area-specific D&B enables SPSS providers to develop adequate marketing campaigns, design customized offers, and adjust their value propositions to resonate with the unique needs and preferences of consumers in different areas of need. This research contributes to the practical implications of SPSS adoption by guiding businesses in optimizing their market penetration and enhancing their competitiveness, thereby contributing to the broader societal shift towards sustainability.

6.2. Limitations and future research questions

The present research displays a series of limitations that should be acknowledged. Firstly, as the study focused solely on consumers in Brussels, the generalizability of the results is restricted. Future research should explore the topic in other regions or cultural contexts to highlight potential cultural differences in D&B to SPSS adoption, and their variation across areas of need. Given that Brussels is renowned as one of the most congested cities in Europe (INIX, 2023), inhabitants are likely to pay special attention to the seamless accessibility and availability of mobility items, for example. Additionally, another aspect limiting generalizability is the timing of data collection, which took place during the COVID-19 pandemic, a period during which consumer behaviour was notably affected (Cai et al., 2023; de Medeiros et al., 2021; Hazée and Van Vaerenbergh, 2021), although some changes may be temporary. Finally, the generalizability of our findings is further constrained by the nonprobability sampling method employed for data collection (see Appendix C). Examining a broader range of geographical locations and time periods, with a probability sampling method, would provide a more comprehensive understanding of changes in D&B across different socio-demographics, cultural and contextual backgrounds.

Secondly, the research focused on studying the intention to adopt rather than the actual adoption of SPSS offers. While intention is a valuable construct, actual adoption behaviours may not align perfectly with stated intentions (ElHaffar et al., 2020), especially if one acknowledges the importance of deeply entrenched habitual practices (Muylaert and Maréchal, 2022; Mylan, 2015). To overcome this limitation, future research could make use of experimental designs or longitudinal studies to capture the actual adoption of SPSS and assess the variation of factors influencing real world adoption decisions across areas of need.

Finally, another limitation is that (intention of) adoption of SPSS offers does not necessarily imply a complete replacement of traditional product purchases, nor does it guarantee a shift to less resource-intensive practices (Chapman et al., 2020), both of which have implications for sustainability (Roman et al., 2023). Research should further investigate the extent to which SPSS adoption contributes to the reduction of traditional product purchases and replaces or displaces more sustainable pre-existing behaviours. This is particularly relevant when examining how socio-economic status could influence whether consumers choose to substitute or supplement existing practices. Understanding the role of SPSS adoption as a replacement for of resource-intensive practices or products can shed light on the potential environmental benefits and help develop strategies to encourage sustainable consumption patterns.

CRediT authorship contribution statement

Fanny Dethier: Writing – original draft, Visualization, Validation, Supervision, Software, Methodology, Formal analysis, Data curation, Conceptualization. **Roxane De Hoe:** Writing – review & editing, Validation, Software, Methodology, Investigation, Formal analysis, Conceptualization. **Coralie Muylaert:** Writing – review & editing, Methodology, Conceptualization. **Philippe Roman:** Writing – review & editing, Supervision, Project administration, Methodology, Funding acquisition, Conceptualization. **Coline Ruwet:** Writing – review & editing, Project administration, Funding acquisition, Conceptualization. **Géraldine Thiry:** Writing – original draft, Supervision, Project administration, Methodology, Funding acquisition, Conceptualization. **Kevin Maréchal:** Writing – review & editing, Writing – original draft, Supervision, Project administration, Methodology, Funding acquisition, Conceptualization.

Ethical approval

The research was conducted in compliance with research ethics policies at the University of the First Author. Informed consent was obtained from all individual participants included in the study. This article does not contain any studies with animals performed by any of the authors.

Declaration of AI-assisted technologies in the writing process

During the preparation of this work, the authors used ChatGPT 3.5 (OpenAI, 2023) in order to improve the text readability. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

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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.

Appendices.

Appendix A. Vignettes summary

Modalities of each vignette are summarized in Table A.1.

Table A.1
Vignettes modalities

Area of need	Mobility	Clothing	Tooling
Name of the SPSS offer	EasyMOB	La vêtithèque	L'objèthèque
Description of the SPSS offer	Car/bike rental system for getting in and out of town	Everyday clothing rental system	Rental system for objects and tools with low use frequency
Stated philosophy of the SPSS offer	To offer flexibility for your movements inside and outside the city and to reduce your carbon footprint	To consume more responsibly by reducing over-consumption and waste	To reduce overconsumption and to save space in your home
Subscription information	80€/month, 500€ of deposit on registration	30€/month	30€/month
Quantity allowed for renting	/	Max. 6 items/15 days, that is 12 items/month	Almost unlimited: objects/tools with a maximum value of 1000€/month
Frequency of use allowed	Unlimited in car/bike combo but not simultaneous	Every 15 days with the possibility of extending 15 days twice successively	Rent for 15 days, renewable twice successively, if the object is not booked by another user
Services included	All-inclusive formula: fuel/recharge, maintenance, repair, insurance, breakdown service	Free repairs and cleaning of clothing upon return	Support for any repairs free of charge
Objects/tools quality	Hybrid or electric cars, electric bikes (environmentally friendly)	High quality, durable clothing (hard-wearing and environmentally friendly)	High quality and durable (resistant and environmentally friendly)
Booking procedure	Performed via an app	A physical store and an online store are at your disposal	Performed via an app or on the website
Methods for withdrawal and return	Geolocation, surface parking or free underground parking from the Interparking network	According to your wishes, either in-store or by delivery (3.5€ delivery charge).	At the relay point closest to your home
Rule of use	No smoking, drinking or eating in the vehicle; removal of personal belongings	/	/

Appendix B. Scales adaptation

From their original form, scales have been shortened, for conciseness matters, prior and after the administration of the survey (see Table B.1). Selected items have been considered more central than dropped ones, considering as such the maximization of scales content validity. Also, the response scale has been changed (from five to seven points Likert-scale), items have been translated from English into French and Dutch and when the referent of the item was collective, it has been transformed into individual. A forward items translation has been performed collectively by the authors team and then, refined by a linguist. We have added one item—item 10—to the original environmental concerns scale. Given our research focuses on intention and behaviour, we had to address environmental concerns as actions, not just thoughts.

Table B.1
Scales adaptation

Original form		Item dropped		Item kept
		Prior to data collection	After data collection	
Consumerism (adapted from Richins and Dawson, 1992)				
	I buy things that I never or rarely use.			Item 1
	I prefer to have my items available, even if I don't use them often.			Item 2
Materialism ((Richins and Dawson, 1992))				
Success	I admire people who own expensive homes, cars, and clothes.	x		
	Some of the most important achievements in life include acquiring material possessions.		x	
	I don't place much emphasis on the amount of material objects people own as a sign of success. *			Item 3
	The things I own say a lot about how well I'm doing in life.	x		
	I like to own things that impress people.	x		
	I don't pay much attention to the material objects other people own. *	x		
Centrality	I usually buy only the things I need. *		x	
	I try to keep my life simple, as far as possessions are concerned. *	x		
	The things I own aren't all that important to me. *			Item 4
	I enjoy spending money on things that aren't practical	x		

(*continued on next page*)

Table B.1 (*continued*)

Original form		Item dropped		Item kept
		Prior to data collection	After data collection	
	Buying things gives me a lot of pleasure.	x		
	I like a lot of luxury in my life.	x		
	I put less emphasis on material things than most people I know. *	x		
Happiness	I have all the things I really need to enjoy life. *			Item 5
	My life would be better if I owned certain things I don't have.		x	
	I wouldn't be any happier if I owned nicer things. *			Item 6
	I'd be happier if I could afford to buy more things.	x		
	It sometimes bothers me quite a bit that I can't afford to buy all the things I'd like.	x		
Environmental concerns ((Diekmann and Preisendörfer, 2003))				
Affective aspects	I am afraid when I think about environmental conditions for future generations.	x		
	If we continue our current style of living, we are approaching an environmental catastrophe.	x		
	Watching TV or reading in the newspaper about environmental problems, I am often embarrassed and angry.			Item 7
Cognitive aspects	The great majority of German people do not act in an environmentally responsible way.	x		
	There are limits of economic growth which the industrialized world has already reached or will reach very soon			Item 8
	In my opinion, environmental problems are greatly exaggerated by proponents of the environmental movement. *	x		
Conative aspects	It is still true that politicians do much too little to protect the environment.	x		
	To protect the environment, we all should be willing to reduce our current standard of living.			Item 9
	Environmental protection measures should be carried out, even if this reduces the number of jobs in the economy.	x		
For ecological reasons, I have voluntarily changed certain things in my life.		Item added to the original scale – Item 10		

* Reverse scored items.

Three different principal component analysis (PCA), in each area of need under consideration here, support the validity of the shortened and adapted scales. Both eigenvalues and cumulative explained variance indicate a three-factor solution. In addition of supporting scales validity, PCA results (after a varimax rotation) were used to summarize items information into three variables measuring personality traits—consumerism, materialism, and environmental concerns (see Table B.2).

Table B.2
principal component analysis, varimax rotation

Items	Factor 1			Factor 2			Factor 3			Unexplained variance		
	Environmental concerns			Materialism			Consumerism					
	M.	C.	T.	M.	C.	T.	M.	C.	T.	M.	C.	T.
Item 1							0.70	0.53	0.71	.22	.59	.29
Item 2							0.69	0.70	0.65	.22	.33	.30
Item 3				.51	.38					.51	.49	.67
Item 4				.54	.68	0.61				.46	.38	.44
Item 5				.57	.45	0.43				.45	.57	.55
Item 6				.30	.38	0.54				.67	.59	.44
Item 7	.50	.48	.50							.25	.37	.37
Item 8	.49	.37	.45							.36	.52	.38
Item 9	.51	.54	.50							.19	.26	.29
Item 10	.46	.50	.44							.30	.37	.40
Eigen value	3.45	3.06	3.21	1.72	1.34	1.51	1.20	1.14	1.15			
Cumulative variance explained	.29	.27	.28	.48	.41	.45	.64	.55	.59			

Notes. Loadings less than .3 are not displayed to improve readability of table. M. = Mobility; C. = Clothing; T. = Tooling.

Appendix C. Sample and targeted population comparison

Table C.1 presents the socio-demographics of the study sample compared to the target population, defined as the inhabitants of the Brussels Capital Region (referred to as "Brussels" in this research). Whenever possible, data for the target population focuses on the age group relevant to consumers, as this study specifically examines consumer intentions. The data for the target population is sourced from the Brussels Institute for Statistics and Analysis (IBSA).

Table C.1
Comparative Summary Statistics of sample and target population

Sample			Target population		
Mean of Age		39.11 years	Mean age of the population as of January 1, 2021		37.65 years
Proportion within the Gender category	Female	48.9 %	Percentage of women in the population as of January 1, 2021		50.89 %
Proportion within the Education category	Primary school	4.04 %	Three-year average (2019–2021) of the proportion of the population aged 15 and older	with a low education level, meaning that the highest degree obtained is a junior high school diploma.	32.55 %

(*continued on next page*)

Table C.1 (*continued*)

Sample			Target population		
	Junior high school	9.31 %			
	Senior high school	36.76 %		with an average level of education, meaning that the highest degree obtained is a senior high school diploma.	25.98 %
	Bachelor's degree	22.67 %		with a high level of education, meaning that the highest degree obtained is a higher education diploma.	41.47 %
	Master's degree	27.21 %			
Proportion within the Net monthly income category	[0 €; 1000 € [	11.89 %	For the income year 2021, the proportion of declarations in the category of net taxable income	[0 €; 10.000 € [	29.95 %
	[1000 €; 2000 € [	22.92 %		[10.000 €; 20.000 € [	23.3 %
	[2000 €; 3000 € [	25.61 %		[20.000 €; 30.000 € [	18.54 %
	[3000 €; 4000 € [	15.56 %		[30.000 €; 40.000 € [	10.31 %
	[4000 €; 5000 € [	12.25 %		[40.000 €; 50.000 € [	6.13 %
	[5000 €; 6000 € [	4.53 %		[50.000 €; ∞	11.78 %
	[6000 €; ∞	7.23 %			

Overall, our sample is similar to the target population in terms of Age and Gender. However, our sample appears to be more educated compared to the target population. Comparing income categories is more challenging due to the differing measurement variables: we used self-declared net monthly income, while data available for the target population are the declared annual taxable income. Nevertheless, the data suggest that the highly low income class is underrepresented while middle and high-income classes are overrepresented in our sample. These differences arise from the nonprobability sampling technique, which limits the generalizability of our results to the target population.

Data availability

Link to the dataset has been shared at the "attach files" step
Survey data on divers and barriers to consumers' intention to adopt an SPSS offer - Brufonctionnel project (Original data) (Mendeley Data)

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