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Research article

Role of consumer mindsets, behaviour, and influencing factors in circular consumption systems: A systematic review

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ABSTRACT

The transition to a circular economy presents new ways to create and offer value by proposing changes to current production and consumption systems. This study focuses on the challenges concerning consumers' acceptance of circular offerings and their engagement with the circular economy. Through a systematic literature review, we investigated consumers' mindsets, behaviour, and influencing factors, and positioned them in circular consumption systems. This review was conducted using two databases, Scopus and Web of Science, in January 2020 and updated in September 2020. A total of 107 articles were screened, and 53 were included in the analysis. We mapped 6 circular mindsets, 14 circular behaviours, and 54 factors that influenced them. Our results show that broad interpretations and generalisations concerning these elements should be carried out carefully, as they are highly contextually driven. However, their role in consumption systems is clear. Consumers' mindsets are the starting point of circular consumption systems, as they present pre-dispositions in engaging with circular offerings. These mindsets are expressed by consumer behaviour, which allows product flow in these systems; they, in turn, are affected by influencing factors. We suggest that continued updates on this systematic literature review should be conducted, along with the development of a structured tool to help organisations engage their consumers by developing circular mindsets and encouraging circular behaviour, using the influencing factors.

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1. Introduction

Consumption systems represent a set of activities, decisions, and behaviours that comprise the acquisition and usage of products and services to meet customers' needs (Sun et al., 2016; Woodside and Dubelaar, 2002). Such systems consist of structural elements, the products and/or services offered, transactional processes, the stages of acquisition, and post-acquisition activities that are part of the customer experience (Lebel and Lorek, 2008; Sun et al., 2016).

The set of consumers' activities, decisions, and behaviour following the principles of the circular economy (CE) is called a circular consumption system. CE is an economic model that proposes an alternative to the linear pattern of production and consumption, take-make-dispose. CE is a complex concept (Blomsma and Brennan, 2017; Prieto-Sandoval et al., 2018) that aims to achieve sustainable development (Murray et al., 2017; Ritzén and Sandström, 2017), which comprises a multi-level and holistic approach (Geissdoerfer et al., 2017; Prieto-Sandoval et al., 2018),

disruptive innovation (BSI, 2017; Park et al., 2010), and minimisation of resource demand (EMF, 2017; Ghisellini et al., 2016; Haas et al., 2015).

Circular consumption systems (Fig. 1), therefore, represent the systems in which consumers meet their needs through circular transactional processes: the acquisition, use, and post-use of circular products and services. Muranko et al. (2020) describe these circular transaction processes as behavioural chains, the sequence of unique and consecutive actions performed throughout the consumption of a circular offering.

Challenges concerning the acceptance and consumption of circular products have been highlighted in the CE literature (Camacho-Otero et al., 2018; Kirchherr et al., 2017), and the success of circular initiatives has been associated with consumers' predispositions and the likelihood to behave according to CE's goals (Daee et al., 2018). However, to the best of our knowledge, no comprehensive investigation of circular consumption systems has been conducted in the CE field. Thus, we examine, through a systematic literature review, the role of mindsets and behaviour, and their influencing factors in circular consumption systems.

Circular mind-sets are presented by the Circular Design Guide (EMF, 2018) as the changes that must occur in design thinking to both bring elements of circularity in offerings and leverage the CE through these offerings. The circular organisational mindset, in turn, is defined as the

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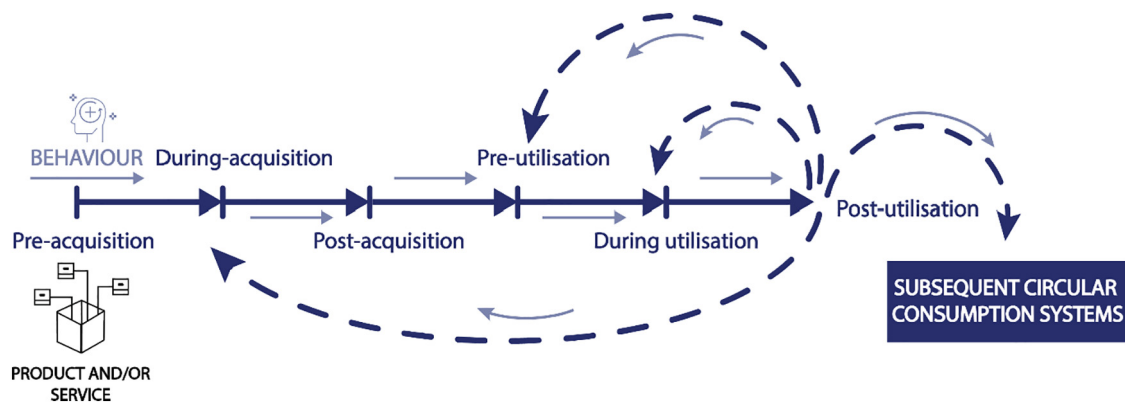


Fig. 1. Circular consumption systems.
Source: Adapted from Muranko et al. (2020).

assumptions and beliefs that determine how an organisation interprets and responds to situations (Bertassini et al., 2021). An individual's mindset is the position from which people act and express themselves (Dweck, 2017). Consequently, we propose that a circular consumer mindset is the belief and pre-disposition of the consumer when engaging with circular products or services. However, the mindset of circular consumers has not yet been mapped. Therefore, the first goal of this study is to identify consumers' mindsets in CE literature.

Muranko et al. (2018) define (pro)circular behaviour as the behaviour which results from prioritising resource efficiency, and benefits, or at least reduces, damage to the environment, economy, and society. Thus, circular consumer behaviour is one that promotes resource efficiency, as well as the flow of circular value, in consumption systems. The second goal of this study is to identify consumers' behaviour addressed in the CE literature.

Circular behaviour is not always entrenched in people's consumption patterns, as circular solutions depend on overcoming cultural barriers (Campbell-Johnston et al., 2019). Therefore, the CE transition implies behavioural changes (Botelho et al., 2016) and an understanding of all that circular consumption entails (Calvo-Porrall and Levy-Mangin, 2020). Accordingly, the third objective of this study is to identify the factors that influence, hinder, and boost customer engagement in circular consumption systems.

Finally, we propose a framework that presents the role of consumers' circular mindsets, behaviour, and influencing factors in circular consumption systems, and the way these concepts interrelate.

2. Methodology

A systematic literature review (SLR) was chosen to summarise the existing evidence on circular consumption. Our preliminary investigation on the theme showed that there are gaps in the CE literature concerning consumers' mindsets, behaviour, and influencing factors in circular consumption systems, which we address with the following research objectives:

- i. Identify consumers' mind-sets in the CE literature;
- ii. Identify consumers' behaviour addressed by the CE literature;
- iii. Identify the factors that influence, hinder, or boost customer engagement in circular consumption systems.

This SLR was undertaken based on the guidelines proposed by Kitchenham (2004) and Conforto et al. (2011) and revised and reported as per the PRISMA 2020 guidelines (Page et al., 2021), including only articles published in peer-reviewed journals in

English. There were no restrictions concerning the studies' year of publication or data collection, field of publication or circular business model, or applied methodology. Based on these eligibility criteria, we conducted electronic searches of two databases, Scopus and Web of Science, on 21 January 2020. The search was updated on 29 September 2020. The search strings were as follows:

- Scopus
 - o TITLE-ABS-KEY (“circular economy” AND “mindset”) AND (LIMIT-TO (DOCTYPE, “ar”)) AND (LIMIT-TO (LANGUAGE, “English”))
 - o TITLE-ABS-KEY (“circular economy” AND “consumer behavio*r”) AND (LIMIT-TO (DOCTYPE, “ar”)) AND (LIMIT-TO (LANGUAGE, “English”))
 - o TITLE-ABS-KEY (“circular economy” AND “consumer acceptance” AND (LIMIT-TO (DOCTYPE, “ar”)) AND (LIMIT-TO (LANGUAGE, “English”))
 - o AND (LIMIT-TO (DOCTYPE, “ar”)) AND (LIMIT-TO (LANGUAGE, “English”)).
- Web of Science
 - o TS = (“circular economy” AND “mindset”);
 - o TS = (“circular economy” AND “consumer behavio*r”);
 - o TS = (“circular economy” AND “consumer acceptance”);
 - o TS = (“circular economy” AND “behavio* change”).

The selection process, conducted by the main author of this study, was conducted according to the iterative process suggested by Conforto et al. (2011), which included three filters: the first filter analyses the title, abstract, and keywords; the second filter is the introduction and conclusion; and the third filter considers the whole document. As these three phases are significantly different sections of the documents, each filter has a specific inclusion criterion:

- First filter: the article must include the themes of circular economy and mind-set or behaviour.
- Second filter: the article must approach the behaviour or behaviour change of consumers when facing circular offerings.
- Third filter: the article had to attend to at least one of this research's objectives: present consumers' circular mindsets, behaviour, and/or influencing factors.

Subsequently, we developed a standardised data collection sheet to compile relevant data from the articles. The collection sheet contained the following information: authors, title, journal, year, DOI (Digital Object Identifier), circular mind-sets, circular behaviour, and factors influencing circular behaviour. If the article presented a case study, the following

data were also collected: circular business model, location of case study, and type of product studied. Eligible outcomes were categorised as follows:

- Circular mind-sets;
- Circular behaviour;
- Influencing factors:
 - o Political and legal;
 - o Economic;
 - o Environmental;
 - o Demographic;
 - o Consumer related;
 - o Product/Service offer;
 - o Product/Service related.

Finally, to address our fourth objective, we analysed the data gathered during this SLR to develop a framework on how circular mindsets, behaviour, and influencing factors are interrelated, and their role in circular consumption systems. We developed a collaborative framework and discrepancies were resolved through discussion.

3. Results

During the first search in January 2020, we found 131 articles that were analysed for duplicate removal, which resulted in 75 catalogued articles. This search was updated using the same strings and databases in September 2020, returning 55 new articles, 32 of which were not repeated. Therefore, 107 articles were reviewed in this SLR, of which three were unavailable. Of the resulting 104 articles, 77 were approved in the first filter, 61 in the second, and 53 in the third (Fig. 2).

3.1. Summary of the review's results

Of the 53 articles analysed, 77% were published in 2019 or later, indicating that research on consumers' mindsets and behaviour towards a CE is recent in CE literature. Additionally, the majority of studies included in the review present their results according to circular business models (CBMs) (Fig. 3); besides presenting their reflections on circular mindsets, behaviour, and/or influencing factors, these articles also contribute to the characterisation of consumers' engagement in specific CBMs.

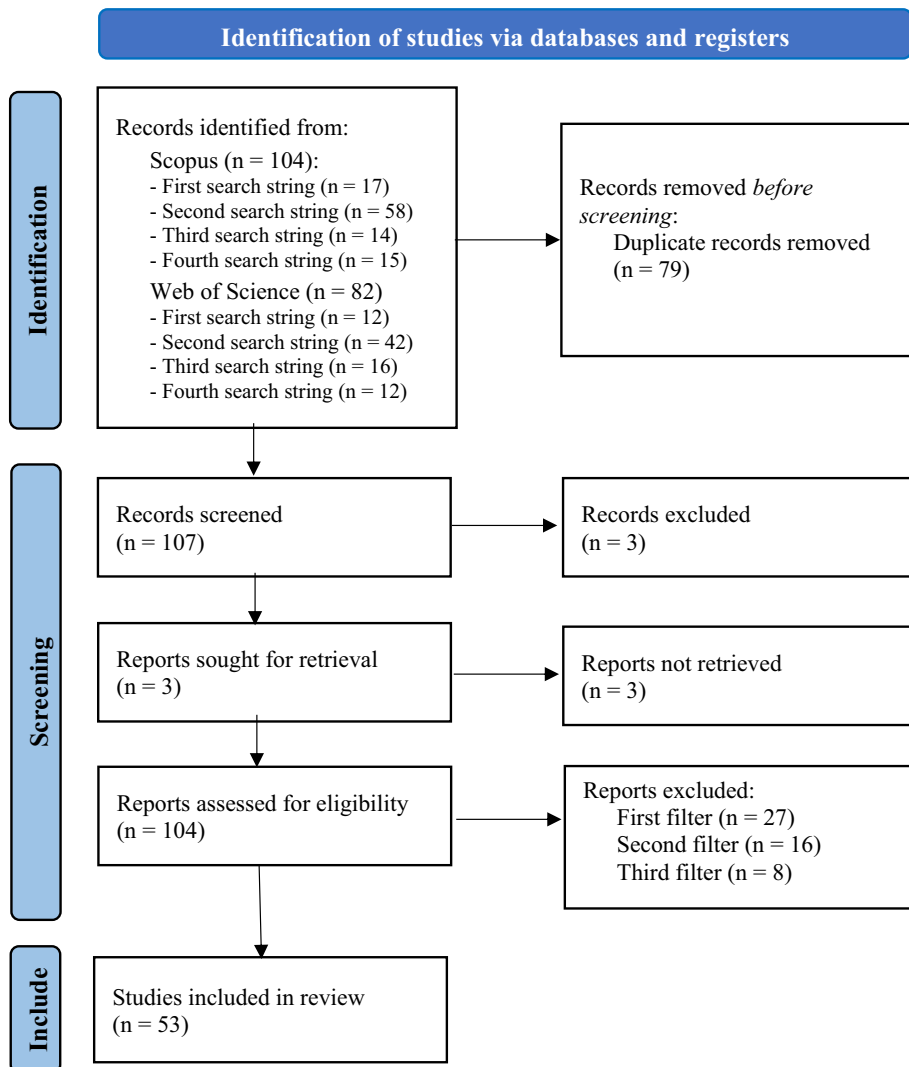


Fig. 2. Systematic literature review (flow diagram). Source: Adapted from Page et al. (2021).

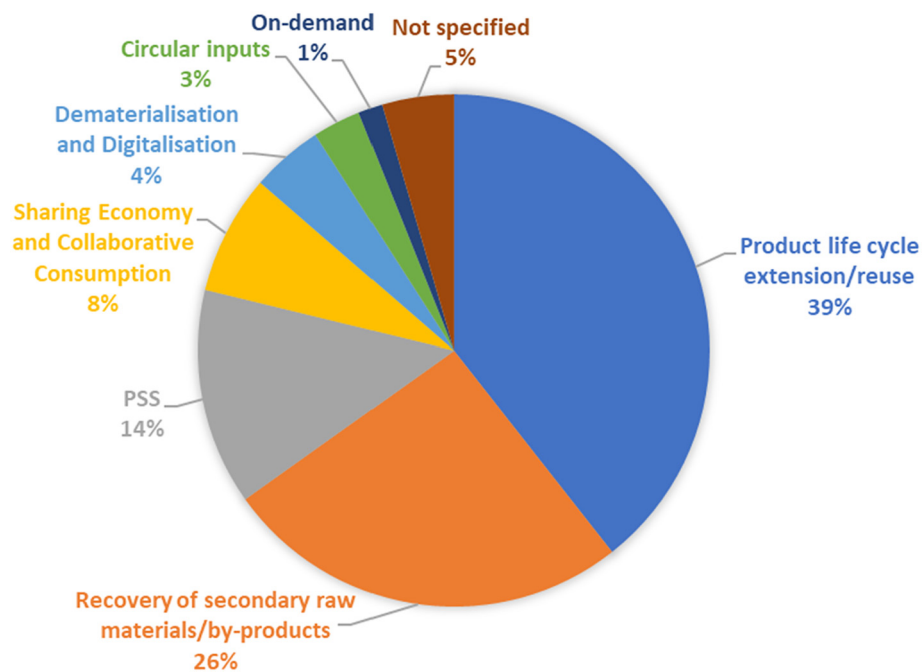


Fig. 3. Case studies divided by circular business models.

Product life cycle extension/reuse was the circular business model addressed by the greater number of studies analysed. The circular behaviour and mindsets of consumers associated with this CBM mostly focus on the preservation and creation of value through the materiality of the products. The second most cited CBM was the recovery of secondary raw materials/by-products, which indicated consumers' mind-sets and behaviour concerned with closing the loop of production and consumption systems. These results show that most studies still focus on the materiality of circular offerings, which include return cycles, take-back systems, remanufacturing, and recycling.

Research concerning product-service systems (PSS), sharing economy, and collaborative consumption circular business models were also registered, and the circular mindsets and behaviour associated with them address the access, adoption, and sharing of products and services. A minor percentage of papers approached dematerialisation and digitisation, circular inputs, and on-demand, thereby suggesting a gap in the literature regarding these CBMs. These business models are associated with mindsets and behaviour concerning the reduction of material utilisation and dependency on finite resources.

Furthermore, we identified the types of products that the reviewed articles focused on. Studies concerning circular electronics, such as mobile phones and personal computers, were addressed in 16 articles, and represented the most common type of product found in our study. Articles addressing circular apparel (10 articles) and greener commuting modes (eight articles) were also fairly popular. Other types of products, such as household appliances, furniture, fast-moving consumer goods (FMCGs), and foods and drinks, were also registered through this systematic literature review.

3.2. Syntheses of results

3.2.1. Circular mind-sets

The circular mind-sets identified in our SLR are presented in Table 1.

Favouring the acquisition/utilisation of circular products is common to the majority of studies that present circular mindsets. Calvo-Porrall and Levy-Mangin (2020) identify this mindset as a variable that precedes the acquisition of circular products, such as remanufactured (Pisitsankhakharn and Vassanadumrongdee, 2020; Wang and Hazen, 2016; Wang and Kuah, 2018; Wang et al., 2020), recycled products

(Calvo-Porrall and Levy-Mangin, 2020), and refurbished products (van Weelden et al., 2016). According to Russo et al. (2019), this mindset also expresses consumers' willingness to switch their buying behaviour by preferring circular products instead of unsustainable ones, for example, choosing bio-based packaging made from regenerated bio-waste instead of non-degradable packaging (Russo et al., 2019).

Favouring access rather than ownership is a mindset associated with consumers who adopt service-based (Chamberlin and Boks, 2018; Mashhadi et al., 2019; Poppelaes et al., 2020; Tunn et al., 2019) or shared business models (Barbu et al., 2018). According to Barbu et al. (2018), this mindset expresses a pre-disposition to new and innovative forms of consumption, thus valuing the utility of products and resources and expressing a shift in consumers' preferences (Mashhadi et al., 2019). Furthermore, Poppelaes et al. (2020) highlight the importance of this mindset for the successful return of products to manufacturers at the end of their life cycle by enabling detachment from products' access to their ownership.

Botelho et al. (2016) and van der Laan and Aurisicchio (2019) associate valuing participation in material recirculation mindset with consumers' pre-disposition to participate in take-back systems and is considered a key variable for the collection and recycling of products and materials, thus contributing to the product life cycle extension/

Table 1
Consumers' circular mind-sets.

Circular consumer mind-sets	Authors
Favour acquisition and utilisation of circular products	Calvo-Porrall and Levy-Mangin, 2020; Pisitsankhakharn and Vassanadumrongdee, 2020; Russo et al., 2019; van Weelden et al., 2016; Wang and Hazen, 2016; Wang and Kuah, 2018; Wang et al., 2020
Favour access instead of ownership	Barbu et al., 2018; Chamberlin and Boks, 2018; Mashhadi et al., 2019; Poppelaes et al., 2020; Tunn et al., 2019
Value participation in material recirculation	Botelho et al., 2016; van der Laan and Aurisicchio, 2019
Favour digital and shared circular services	Camacho-Otero et al., 2019; Poppelaes et al., 2018
Resistance to obsolescence	Chamberlin and Boks, 2018; Haines-Gadd et al., 2018
Value multi-functional products	Kasulaitis et al., 2020

reuse circular business model. Camacho-Otero et al. (2019) assert the pre-disposition to accept digital and shared circular offerings as a mindset that helps users satisfy their consumption needs while complying with CE principles. Poppelaaresm et al. (2018) state that digital access to services embedded in physical products, e.g., smartphones, and cloud/backup services can enhance consumers' pre-disposition to return their products and engage in access-based business models.

Resistance to obsolescence concerns the mindset of consumers who are predisposed to prevent the early disposal of products, promote their long use, and therefore mitigate excessive consumption (Chamberlin and Boks, 2018). According to Haines-Gadd et al. (2018), consumers with this mindset value circular offerings that promote lasting relationships between them and manufacturers, while enhancing product longevity and slowing inner loops.

Finally, Kasulaitis et al. (2020) present a consumer mindset that expresses consumers' pre-disposition and preference to accept multi-functional over single-or few-function products. This mindset is related to technological progress, dematerialisation of products, and enhancement of material efficiency in electronic products such as TVs and smartphones (Kasulaitis et al., 2020).

3.2.2. Circular behaviour

Consumer behaviour is the realisation of circular mindsets. Throughout the consumption system, consumers' circular behaviour can be expressed in many ways and at many stages of the consumption chain. Table 2 presents the circular behaviour identified in the SLR.

The consumer behaviour of acquiring products that have been recycled, remanufactured, or reconditioned is closely related to acceptance and engagement with the product life cycle extension/reuse circular business model. This behaviour has been broadly mentioned in the literature concerning specific products, such as apparel (Baier et al., 2020), bicycles (Gan and Chen, 2019), and electrical and electronic (Feng et al., 2021; Kuah and Wang, 2020; Mugge et al., 2018), and also generalisations on any kind of recycled, remanufactured, or reconditioned products (Calvo-Porrall and Levy-Mangin, 2020; Hazen et al., 2016; Muranko et al., 2018; Wang and Kuah, 2018). Esmaeilian et al. (2020) associate this behaviour with other circular behaviours across the consumption system, such as reducing consumption, product repair and maintenance, and returning products at their end of life, thus showing that circular consumption systems are designed as behaviour chains.

The second most-cited circular consumer behaviour in our SLR is caring for and maintaining products. According to Ackermann et al. (2018), this behaviour is related to prolonging a product's lifetime through preventive measures (e.g. using a smartphone cover), performing maintenance (i.e. maintaining a product in a sound state), and repairing (i.e. restoring a product's utility). Studies on this behaviour have focused on two aspects of the circular consumption system: providing easy repair and maintenance products, and enabling and motivating consumers to perform these activities (Ackermann, 2018; Baier et al., 2020; Botelho et al., 2016; Daae et al., 2018). These aspects are further discussed in the influencing factors section of the results. Furthermore, this behaviour extends through many stages of the consumption system by demanding conditions such as adequate storage, constant cleaning, and protective tools (Ackermann et al., 2018; Esmaeilian et al., 2020; Wastling et al., 2018). Additionally, it has been reported in consumption systems concerning long-lasting products, such as apparel (Baier et al., 2020) and electrical and electronic (Botelho et al., 2016), and fast-moving consumer goods (Muranko et al., 2018).

The approaches concerning the return of products at the end of the lifecycle were fairly similar in the literature as a way to voucher consumers' participation in take-back systems (Botelho et al., 2016; Lakatos et al., 2016), including access-based systems (Poppelaaresm et al., 2020; Wastling et al., 2018). This behaviour is highly important in completing the cyclical path proposed by the CE (Botelho et al., 2016), and is often related to waste separation (Lakatos et al., 2016; Mansuy et al., 2020; van der Laan and Aurisicchio, 2019).

Table 2
Consumers' circular behaviour.

Consumer circular behaviour	Stages	Authors
Acquire recycled, remanufactured, or reconditioned products	Pre-acquisition During acquisition	Baier et al., 2020; Calvo-Porrall and Levy-Mangin, 2020; Esmaeilian et al., 2020; Feng et al., 2021; Gan and Chen, 2019; Hazen et al., 2016; Kuah and Wang, 2020; Mugge et al., 2018; Muranko et al., 2018; Muranko et al., 2019; Wallner et al., 2020; Wang and Hazen, 2016; Wang and Kuah, 2018
Care for and perform maintenance on products	Post-acquisition Pre-utilisation During-utilisation	Ackermann, 2018; Ackermann et al., 2018; Baier et al., 2020; Botelho et al., 2016; Chamberlin and Boks, 2018; Daae et al., 2018; Esmaeilian et al., 2020; Muranko et al., 2018; Wastling et al., 2018
Return products at their end of life	Post-utilisation	Botelho et al., 2016; Esmaeilian et al., 2020; Lakatos et al., 2016; Mansuy et al., 2020; Nowakowski, 2019; Poppelaaresm et al., 2020; van der Laan and Aurisicchio, 2019; Wastling et al., 2018; Wang and Kuah, 2018
Separate waste	Post-utilisation	Campbell-Johnston et al., 2019; Guo et al., 2017; Lakatos et al., 2016; Lakatos et al., 2018; Mansuy et al., 2020; Tong et al., 2018; van der Laan and Aurisicchio, 2019
Acquire certified green products	Pre-acquisition During acquisition	Baier et al., 2020; Esmaeilian et al., 2020; Ferdousi and Qiang, 2016; Guo et al., 2017; Russo et al., 2019; Testa et al., 2020
Recycle goods	Post-utilisation	Botelho et al., 2016; Campbell-Johnston et al., 2019; Chamberlin and Boks, 2018; Daae et al., 2018; Guo et al., 2017; Tong et al., 2018
Reuse goods	During-utilisation Post-utilisation	Baier et al., 2020; Campbell-Johnston et al., 2019; Chamberlin and Boks, 2018; Daae et al., 2018; Machado et al., 2019; Wastling et al., 2018
Share products and services	Pre-acquisition During-acquisition During-utilisation Post-utilisation	Esmaeilian et al., 2020; Kuah and Wang, 2020; Muranko et al., 2018; Patti, 2017; Tunn et al., 2020
Adopt use-oriented products and services	Pre-acquisition During acquisition	Barbu et al., 2018; Chamberlin and Boks, 2018; D'Agostin et al., 2020; Mashhadi et al., 2019; Tunn et al., 2020
Dispose of product/waste appropriately	Post-utilisation	Clark et al., 2020; Esmaeilian et al., 2020; Nenckova et al., 2020; Sarigöllü et al., 2020
Reduce consumption	Pre-acquisition During-utilisation Post-utilisation	Baier et al., 2020; Campbell-Johnston et al., 2019; Esmaeilian et al., 2020
Save energy and water	Post-acquisition Pre-utilisation During-utilisation Post-utilisation	Esmaeilian et al., 2020; Guo et al., 2017
Use refills	Pre-acquisition During-acquisition Post-utilisation	van der Laan and Aurisicchio, 2019
Consume locally	Pre-acquisition During-acquisition	Esmaeilian et al., 2020
Consume organic products	Pre-acquisition During-acquisition	Fogarassy et al., 2020

Waste separation is also a circular behaviour present in the post-utilisation stage of the consumption system. In addition to being associated with take-back systems (Lakatos et al., 2016; Mansuy et al., 2020; van der Laan and Aurisicchio, 2019), it has been traced back to investigations concerning the daily behaviour of households in the CE context (Campbell-Johnston et al., 2019; Guo et al., 2017; Lakatos et al., 2018; Tong et al., 2018).

The acquisition of certified green products, conversely, is a consumer behaviour present in the pre- and during-acquisition stages, as this behaviour requires effort prior to the purchase; for example, browsing certified brands and products (Baier et al., 2020; Esmaeilian et al., 2020; Russo et al., 2019) and during the purchase by giving preference to available green products (Baier et al., 2020; Ferdousi and Qiang, 2016; Guo et al., 2017; Testa et al., 2020). This behaviour expresses consumers' willingness to break consumption patterns and test new products and brands (Testa et al., 2020).

In addition to waste separation, consumer recycling behaviour has been studied in the context of households' daily circular behaviour (Campbell-Johnston et al., 2019; Guo et al., 2017; Tong et al., 2018). Additionally, for some researchers, recycling behaviour was not directly associated with the recycling activity of consumers, but with consumers' destination of products to recycling facilities (Botelho et al., 2016; Chamberlin and Boks, 2018; Daae et al., 2018). Reusing behaviour represents the recirculation of products in their own consumption systems (Campbell-Johnston et al., 2019; Wastling et al., 2018) or in subsequent circular systems (Baier et al., 2020; Machado et al., 2019; Wastling et al., 2018), thus maintaining their original purpose (Chamberlin and Boks, 2018; Daae et al., 2018).

Sharing products and services is a circular consumer behaviour associated in the literature with two business models, sharing economy and collaborative consumption, through physical (Kuah and Wang, 2020; Patti, 2017) or digital (Esmaeilian et al., 2020) platforms, and PSS (Muranko et al., 2018; Tunn et al., 2020). PSSs are also directly related to another circular behaviour: the adoption of use-oriented products and services (Chamberlin and Boks, 2018; D'Agostin et al., 2020; Mashhadi et al., 2019; Tunn et al., 2020). Barbu et al. (2018) highlight the relevance of this behaviour for the sharing economy, by focusing on consumers' predisposition to access the product's function instead of owning it.

Consumer behaviour towards appropriate waste disposal was found in the CE literature on food packaging (Clark et al., 2020), textile products (Nenckova et al., 2020), and mobile phones (Sarigöllü et al., 2020). Esmaeilian et al. (2020) focus on how virtual platforms and digital services can help consumers engage in circular behaviour towards waste disposal. Nenckova et al. (2020) hold that consumer preferences and behaviour concerning textile waste disposal are crucial in mapping where waste streams terminate and guiding efficient end-of-life strategies.

The reduction in consumption is displayed as an important behaviour for the successful transition to a CE in sectors where exacerbated consumption patterns prevail, such as the clothing industry (Baier et al., 2020). This behaviour has also been reported in the context of daily household activities (Campbell-Johnston et al., 2019; Esmaeilian et al., 2020). In the same household context, researchers have also presented energy and water saving as relevant consumer behaviour for the implementation of a CE (Esmaeilian et al., 2020; Guo et al., 2017).

Fogarassy et al. (2020) highlight the many roles consumers play in a CE and investigate the consumption of organic food as a pro-circular behaviour. Esmaeilian et al. (2020) emphasize blockchain as the future of the supply chain, and how digital networks support consumers in their transition to a CE, including access to services that promote local consumption. To conclude the mapped consumers' circular behaviour, in systems where products are designed for single-use as fast-moving consumer goods, researchers found opportunities to prolong these products' life cycles by promoting consumer behaviour such as using refills, for example, plastic bottles and water refill (van der Laan and Aurisicchio, 2019).

3.2.3. Factors influencing circular behaviour

In addition to identifying circular mindsets and behaviour, this study focused on finding and classifying the factors which influence circular behaviour and, consequently, circular mindsets. Each article analysed during this SLR had its own methodological approach, which resulted

in its own contribution to the CE literature. Therefore, this review does not propose to evaluate the most suitable approach when studying circular consumer behaviour but to present the factors that have been considered by the CE literature and have been found to influence circular consumer behaviour. Our review identified 54 factors, which were then classified according to their domain into seven categories: (i) political and legal, (ii) economic, (iii) environmental, (iv) demographic, (v) consumer-related, (vi) product/service offer, and (vii) product/service-related (Table 3).

3.2.3.1. Political and legal factors. The political and legal category refers to factors concerning legislation and public policies such as obligations, incentives, and macro-level forces. Baier et al. (2020) indicate that external forces at the macro level (e.g. social institutions, economic forces, or physical structures) can act as drivers or barriers to the pro-environmental behaviour of clothing consumers. Camacho-Otero et al. (2019) establish that issues concerning the legal implications of transactions and agreements can negatively influence the adoption of circular garments. Furthermore, the migration of consumers from traditional (linear) systems to circular ones is associated with government incentives, such as taxes and subsidies, which can affect the organisation and/or the market, thus making circular products more appealing to consumers (Hazen et al., 2016).

3.2.3.2. Economic factors. The second influencing category is economy, which comprises four factors: price, income, financial return, and savings. Price is one of the most-cited factors in the SLR, and therefore, one of the main influencers of circular behaviour from an economic perspective (Camacho-Otero et al., 2019). Competitive prices are reported as determinants of consumer engagement (Chamberlin and Boks, 2018; Gan and Chen, 2019); therefore, circular products and services with fair and low prices are indicated as positive influencers of circular behaviour (Camacho-Otero et al., 2019; Patti, 2017; van Weelden et al., 2016), especially when associated with high quality (Machado et al., 2019). Wallner et al. (2020) aver that consumers often choose refurbished products because they are cheaper and, therefore, they can opt for premium products compared to the required investment for a new product. Kuah and Wang et al. (2020) find that the low cost of remanufactured products can drive consumer engagement. Wang and Hazen et al. (2016) confirm that the lower cost of remanufactured products is positively related to the perceived value of remanufactured products and acquisition intention, whereas a high perceived price of new products is positively related to consumers' attitudes towards remanufactured products (Wang et al., 2020). Concerning access-based business models, products with lower monthly payments present better consumer acceptance than those with higher monthly payments (Poppelaaresm et al., 2020). Hazen et al. (2016) believe that consumers are more likely to switch to circular products/services if they perceive the costs of their current/linear products or service providers to be high. Moreover, in product-service systems, consumers are more likely to lease if they perceive that the lease cost is lower than the acquisition cost (Mashhadi et al., 2019). Concerning collection services, consumers show preferences for cheaper alternatives, even when they require more effort (Mansuy et al., 2020). When a product's original cost is perceived as high, consumers prefer to resell or give away their products instead of participating in take-back systems (Sarigöllü et al., 2020).

The income of the participants was found to be a relevant economic factor in circular behaviour. While Fogarassy et al. (2020) hold that high income is associated with circular acquisition behaviour (purchase of organic food), Nowakowski (2019) find that people living in poverty are likely to participate in electrical and electronic waste take-back systems, as selling scrap metals is a method of earning money for basic expenses. Additionally, Nenckova et al. (2020) affirm that people with higher incomes tend to separate their textile waste for appropriate disposal, compared to other socio-economic groups.

Table 3
Factors influencing circular consumer behaviour.

Category	Factor	Definition	Authors
(i) Political and legal	Macro-level forces	External factors, such as social institutions and infrastructure	Baier et al., 2020
	Government incentives	Interventions from governmental bodies that promote circular and environmentally friendly initiatives	Hazen et al., 2016
(ii) Economic	Legal obligation	Obligation or duty that is enforced by legislation	Camacho-Otero et al., 2019
	Price	An amount of payment (money) given in return for goods or services	Camacho-Otero et al., 2019; Chamberlin and Boks, 2018; Gan and Chen, 2019; Hazen et al., 2016; Kuah and Wang, 2020; Machado et al., 2019; Mansuy et al., 2020; Mashhadi et al., 2019; Sarigöllü et al., 2020; van der Laan and Aurisicchio, 2019; van Weelden et al., 2016; Wallner et al., 2020; Wang and Hazen, 2016; Wang et al., 2020
	Income	The amount of a gain, usually derived from capital or labour, received in a period	Fogarassy et al., 2020; Nenckova et al., 2020; Nowakowski, 2019
	Financial return	Bonus, discount, or prize given for a consumer due to their efforts in purchasing a service/product or returning a product at the end of life	Abuabara et al., 2019; Baier et al., 2020; Camacho-Otero et al., 2019; Chamberlin and Boks, 2018; Nowakowski, 2019; Poppelaersm et al., 2018
	Savings	An economy of money, time, stress, or another resource	Baier et al., 2020; Barbu et al., 2018; Camacho-Otero et al., 2019; Kuah and Wang, 2020
(iii) Environmental	Scarcity of resources	When demand for a resource exceeds the supply	Gan and Chen, 2019; Machado et al., 2019
(iv) Demographic	Consumer age	The indication that being born in a certain period and having lived the crucial years of formation in a given cultural climate, characterised by particular historical events, leaves a trace on the ways of feeling, thinking, and acting of individuals	Baier et al., 2020; Botelho et al., 2016; D'Agostin et al., 2020; Gazzola et al., 2020; Kuah and Wang, 2020; Nenckova et al., 2020
	Consumer gender	The indication that the consumer gender may influence awareness, sensitivity, acceptance, and adoption of circular behaviour	Baier et al., 2020; D'Agostin et al., 2020; Gazzola et al., 2020; Nenckova et al., 2020
	Consumer level of education	The progression of the formal learning experience	Fogarassy et al., 2020; Nenckova et al., 2020
	Consumer's nationality	The indication that a circular behaviour may be influenced by environmental conditions, cultural aspects, and social norms	Fogarassy et al., 2020
Category	Factor	Definition	Authors
(iv) Demographic	Number of household members	The indication that a circular behaviour may be influenced by the number of people that reside in the same home	Nenckova et al., 2020
(iv) Consumer related	Environmental awareness and concern	The awareness which drives consumers' attitudes regarding the environment, sustainability, and circularity	Abuabara et al., 2019; Botelho et al., 2016; Chamberlin and Boks, 2018; Clark et al., 2020; D'Agostin et al., 2020; Ferdousi and Qiang, 2016; Guo et al., 2017; Hazen et al., 2016; Kuah and Wang, 2020; Machado et al., 2019; Nowakowski, 2019; Patti, 2017; Shao, 2019; Testa et al., 2020; van Weelden et al., 2016; Wallner et al., 2020; Wang and Hazen, 2016; Wang and Kuah, 2018
	Attitude	The degree to which an individual has an unfavourable or favourable appraisal of the behaviour in question	Camacho-Otero et al., 2019; Hazen et al., 2016; Lakatos et al., 2016; Mashhadi et al., 2019; Muranko et al., 2018; Pisitsankhakarn and Vassanadumrongdee, 2020; Singh and Giacosa, 2018; van Weelden et al., 2016; Wang et al., 2020
	Fear of contamination/disgust/lack of trust	The perception of safety risks related to hygiene, especially due to previous use	Calvo-Porral and Levy-Mangin, 2020; Chamberlin and Boks, 2018; D'Agostin et al., 2020; Kuah and Wang, 2020; Poppelaersm et al., 2018; Wang et al., 2020
	Motivation	The reasoning to behave in a particular way, related to financial aspects, pleasure, functionality, aesthetics, rebellion against the brand policy, fit with participant's identity, irreplaceability, shared ownership, etc.	Ackermann, 2018; Ackermann et al. (2018); Botelho et al., 2016
	Ability	If people can perform the behaviour, depends on time, money, physical effort, brain cycles, social deviance, and routine	Ackermann, 2018; Ackermann et al., 2018;
	Product attachment	An emotional connection that leads to an increased likelihood of care activities towards the product and to postponing replacement	Haines-Gadd et al., 2018; Sarigöllü et al., 2020; Singh and Giacosa, 2018
	Intention	Represents the degree to which a person has formulated conscious plans to perform or not perform some specified future behaviour	Hazen et al., 2016; Muranko et al., 2018; Russo et al., 2019; Shao, 2019
	Current sustainable/circular behaviour	The pro-environmental behaviour that consumers/users already perform	Clark et al., 2020; Lakatos et al., 2016; Mashhadi et al., 2019; Testa et al., 2020
Category	Factor	Definition	Authors
(v) Consumer related	Environmental values	Reflect a concern with the quality of nature and the environment for its own sake, without a clear link to the welfare of other human beings	Muranko et al., 2018
	Desire for change	The degree to which a person is willing to change their current behaviour	Camacho-Otero et al., 2019; Testa et al., 2020
	Materialism	The centrality of acquisition-related activities in a person's life and how they prioritize possessions over other things in life	Camacho-Otero et al., 2019
	Peer pressure Norms	Influence from members of a group Feelings of a moral obligation to perform a certain behaviour	Mashhadi et al., 2019 Camacho-Otero et al., 2019; Muranko et al., 2018; Singh and Giacosa, 2018; Pisitsankhakarn and Vassanadumrongdee, 2020; Tong et al., 2018
	Previous experiences	Past experiences with similar offerings (products and services)	Camacho-Otero et al., 2019

(continued on next page)

Table 3 (continued)

Category	Factor	Definition	Authors
	Desire to perform good deeds	Acknowledging the positive social impact related to the behaviour	Abuabara et al., 2019
	Rejection of mass production	Reducing the use of natural resources and diminishing the production of garbage can motivate certain behaviour	Machado et al., 2019
	Lifestyle	A manner of living that reflects the person's values and attitudes	Fogarassy et al., 2020; Patti, 2017
	Environmental self-identity	The extent to which a person sees themselves as a type of person who acts environmentally friendly	Russo et al., 2019
	Digital access	The access of services on digital platforms	Esmaelian et al., 2020
	Digital confidence	Users' digital literacy and confidence to use digital products, which includes privacy, security, and adoption	Tunn et al., 2020
(vi) Product/service offer	Convenience	Ease for a consumer to include circular efforts in his/her routine	Abuabara et al., 2019; Chamberlin and Boks, 2018; Clark et al., 2020; D'Agostin et al., 2020; Kuah and Wang, 2020; Mansuy et al., 2020; Poppelaaresm et al., 2018
	Customer service/support	Warranty, maintenance, etc.	Chamberlin and Boks, 2018; Gan and Chen, 2019; Poppelaaresm et al., 2018; van Weelden et al., 2016
	Closeness	The distance between consumers' home to the store (consumption) or the pick-up point (take-back system)	Abuabara et al., 2019; Botelho et al., 2016; Camacho-Otero et al., 2019
Category	Factor	Definition	Authors
(vi) Product/service offer	Triggers	Stimuli that provoke a behaviour by enhancing either motivation or ability or by working as a signal	Ackermann, 2018; Ackermann et al., 2018
	Availability	The quality of being able to be used or obtained	Chamberlin and Boks, 2018; van Weelden et al., 2016
	Ownership	Way of providing a service that assimilates to the familiar ownership	Chamberlin and Boks, 2018; Kuah and Wang, 2020; Poppelaaresm et al., 2020; Singh and Giacosa, 2018
	Familiarity with business model	How well consumers understand a product/service value proposition	Kuah and Wang, 2020; Poppelaaresm et al., 2018; van Weelden et al., 2016
	Persuasive communication	Messages that are intended to shape, reinforce, or change the responses of another or others	Muranko et al., 2018
	Customisation	To make or include something according to the buyer's or user's needs	Tunn et al., 2019
(vii) Product/service related	Obsolescence	How fast a product becomes outdated	van Weelden et al., 2016;
	Product information and history	How this product was used in the past and how it can meet the consumer needs	Baier et al., 2020; Ferdousi and Qiang, 2016; Fogarassy et al., 2020; Gan and Chen, 2019; Kuah and Wang, 2020; Mugge et al., 2018; Pisitsankkhakarn and Vassanadumrongdee, 2020; Shao, 2019; van Weelden et al., 2016; Wang et al., 2020
	Quality/performance	The degree of excellence of a product or service	Campbell-Johnston et al., 2019; Chamberlin and Boks, 2018; Fogarassy et al., 2020; Gan and Chen, 2019; Kuah and Wang, 2020; Machado et al., 2019; Pisitsankkhakarn and Vassanadumrongdee, 2020; Sarigöllü et al., 2020; van Weelden et al., 2016; Wang and Hazen, 2016
	Design	How the design addresses functionality, comfort, fashion, etc.	Chamberlin and Boks, 2018; D'Agostin et al., 2020; Gan and Chen, 2019
	Brand image/Reliability	The extent to which a brand is seen as 'green'/sustainable/circular, trustworthy and reliable	Chamberlin and Boks, 2018; Gan and Chen, 2019; Kuah and Wang, 2020; Poppelaaresm et al., 2018; van Weelden et al., 2016
	Technology employed	Addresses the offering usability and innovation	Camacho-Otero et al., 2019; Gan and Chen, 2019; Kasulaitis et al., 2020; Poppelaaresm et al., 2018; van Weelden et al., 2016
	Ease of use	Consistency with the values, experiences and needs of potential users	Barbu et al., 2018; Camacho-Otero et al., 2019
	Aesthetic needs	To meet a desirable appearance	Pisitsankkhakarn and Vassanadumrongdee, 2020; Wallner et al., 2020
	Utility	How the product meets a need	Barbu et al., 2018
	Size/type of product	The size of the product can influence the convenience of some circular behaviour	Botelho et al., 2016
	Product 'green' image	How the product or service is perceived as green by its customers and others	Calvo-Porral and Levy-Mangin, 2020
	Material perception	Visual and tactile perception	Clark et al., 2020

Studies also prove how financial returns, in the form of bonuses and prizes, can lead to customer participation in circular consumption systems as a way to engage consumers and get them to familiarise themselves with CBM (Camacho-Otero et al., 2019; Chamberlin and Boks, 2018) or as a reward for taking part in circular systems, for example, in take-back systems (Abuabara et al., 2019; Nowakowski, 2019; Poppelaaresm et al., 2018). Furthermore, a study in the textile industry reports that the lack of bonuses and prizes in circular consumption systems could decrease consumer satisfaction and, therefore, circular behaviour (Baier et al., 2020).

The last economic influence factor is 'savings', as in discounts for the purchase of sustainable/circular products and services, which are found to positively influence circular behaviour (Baier et al., 2020; Barbu et al., 2018; Camacho-Otero et al., 2019; Kuah and Wang, 2020).

3.2.3.3. *Environmental factor*. Simultaneously, resource scarcity can motivate organisations to adopt circular business models; this factor can also influence consumers' behaviour. Gan and Chen (2019) and Machado et al. (2019) found that consumers seek products or materials that are not easily available, thereby adding to the uniqueness of their consumption experience.

However, factors concerning the environment were not broadly presented or discussed in the CE literature, indicating that studies concerning factors such as the availability of resources, climate change, physical surroundings, and their influence on circular consumption behaviour could be further analysed.

3.2.3.4. *Demographic factors*. The fourth category of influencing factors is demography, under which studies have explored the influence of age, gender, level of education, nationality of consumers, and the number

of household members. The relationship between these factors and consumer circular behaviour differs according to the type of product, business model, and research scope, which suggests that there is no consensus among studies on the influence of demographic factors and their significance among CE consumers.

Considering, for example, consumers' age, D'Agostin et al. (2020) find that older consumers are more likely to adopt use-oriented PSS (bicycle leasing), while Kuah and Wang et al. (2020) report that because younger generations have had more experience using sharing platforms, they are more willing to try these platforms in the future. Younger consumers are also more likely to purchase organic food (Fogarassy et al., 2020) and sustainable apparel (Gazzola et al., 2020), while older individuals might prefer to participate in return schemes (Botelho et al., 2016) and to treat textiles in ways which extend their life cycle or enable subsequent utilisation, rather than just discarding them (Nenckova et al., 2020). Differences in circular behaviour with respect to consumer gender were also investigated. Studies have found that women are more likely to engage in circular behaviour, such as the adoption of use-oriented PSS (D'Agostin et al., 2020), acquiring sustainable apparel (Baier et al., 2020; Gazzola et al., 2020) and separation and appropriate disposal of textile products (Nenckova et al., 2020).

Few studies have examined the influence of consumers' education level on circular behaviour. However, higher levels of education are related to the purchase of organic food (Fogarassy et al., 2020) and waste separation (Nenckova et al., 2020). The purchase of organic food is further associated with consumer nationalities, as people in developed countries are expected to believe that organic farming is a better choice for climate protection, animal welfare, and the environment (Fogarassy et al., 2020). To conclude demographic factors, households with few members (1–2) presented a higher rate in textile waste separation and disposal (Nenckova et al., 2020).

3.2.3.5. Consumer related factors. This category includes influencing variables concerning consumers' intrinsic aspects and contains the majority of factors found in the literature, thus indicating that it is one of the main themes explored in terms of circular consumption and consumer behaviour. Many studies have cited environmental awareness and concern as consumers' awareness of sustainability issues (e.g. depleting natural resources, global warming, and pollution), which positively influences circular behaviour. Therefore, consumers are aware that circular products envision environmental benefits (Ferdousi and Qiang, 2016; Hazen et al., 2016; van Weelden et al., 2016), or that linear products cause negative environmental impacts (Chamberlin and Boks, 2018) and promote their engagement with circular behaviours. Shao (2019) reports that consumers who are aware of environmental issues, such as the depletion of natural resources, global warming, and pollution, consider them when making purchase decisions, and participants in Wallner et al. (2020) state that they had purchased refurbished products because reusing products saves natural resources and reduces the amount of waste that is produced. Wang and Hazen et al. (2016) find that environmental awareness regarding remanufactured products is positively related to the perceived value of remanufactured products and acquisition intention; however, in Asia, environmentally conscious consumers do not show a high appreciation for the green concept of remanufactured products (Wang and Kuah, 2018). Environmental awareness and concern have also been found in other research contexts, such as participation in take-back systems (Abuabara et al., 2019; Botelho et al., 2016; Nowakowski, 2019), adoption of product-service systems (D'Agostin et al., 2020; Kuah and Wang, 2020; Patti, 2017), daily sustainable behaviour (Clark et al., 2020; Guo et al., 2017), and packaging (Testa et al., 2020). Machado et al. (2019) establish that consuming second-hand clothing purchased in thrift stores enhances consumers' environmental awareness and, consequently, their engagement with other circular behaviours.

Consumers' positive or negative attitudes towards circular products or services are frequently cited in the literature. In our SLR, attitude was

found to influence intention to behave circularly, indirectly influencing engagement with circular behaviour (Muranko et al., 2018; Pisitsankhakharn and Vassanadumrongdee, 2020) or switching behaviour (Hazen et al., 2016; Wang et al., 2020). Individuals who have a positive attitude towards circular behaviour, that is, consider circular behaviour important and beneficial for the economy and the environment, are likely to perform these behaviours (Lakatos et al., 2016; Mashhadi et al., 2019). Moreover, van Weelden et al. (2016) find that enthusiastic attitudes towards refurbished products drove their acquisition. Consequently, negative attitudes act as barriers to circular engagement (Camacho-Otero et al., 2019; Singh and Giacosa, 2018).

Another influencing factor related to consumers is motivation, which is influenced by external factors (e.g. the usability of a product) and varies according to the context associated with circular behaviour (Ackermann, 2018). In our SLR, motivation was found to influence product care (Ackermann et al., 2018) and the recovery of electrical and electronic waste (Botelho et al., 2016). Additionally, consumers' ability to engage in circular behaviour, related to the knowledge, skills, tools, time, and effort needed to perform the behaviour, has only been addressed by two articles concerning product care (Ackermann, 2018; Ackermann et al., 2018). Consumers' perceived ability to perform product care was positively associated with this behaviour. Moreover, consumers' intention towards circular behaviour is perceived as the final step towards performing the behaviour; therefore, high levels of intention positively influence consumer engagement in circular consumption systems (Hazen et al., 2016; Muranko et al., 2018; Shao, 2019).

Interestingly, individuals who currently perform sustainable or circular behaviour are found to be more likely to perform other circular behaviours (Clark et al., 2020; Lakatos et al., 2016; Russo et al., 2019), and continue to perform their current behaviour (Mashhadi et al., 2019). Consumers' self-identity may also have a significant impact on purchase intention and the intention to switch to circular behaviour and products (Russo et al., 2019). Likewise, circular behaviour can be influenced by consumers' environmental values, which can be used when designing interventions to guide changes in consumer behaviour (Muranko et al., 2018). This factor can be related to consumers' rejection of mass products by, for example, rethinking how fashion can be consumed and adopting sustainable apparel (Machado et al., 2019). In addition to valuing the natural environment, consumers may also value and desire to perform good deeds by supporting social causes such as donating products at the end of their life cycle to marginalised communities (Abuabara et al., 2019).

However, social norms, perceived as collective obligations, concerning linear patterns of production negatively affect customers' circular behavioural intentions (Muranko et al., 2018; Singh and Giacosa, 2018). The pressure and experiences of peers also influence consumer behaviour. Mashhadi et al. (2019) show that individuals whose friends and family lease their phones feel compelled to do so. Additionally, positive previous experiences with a product or service keep consumers engaged in circular consumption systems (Camacho-Otero et al., 2019). Moreover, consumers' current sustainable lifestyle, or wish to develop one, positively influences the adoption of circular behaviour (D'Agostin et al., 2020; Patti, 2017), especially when they perceive that circular purchases can help them achieve this lifestyle, such as the consumption of organic food (Fogarassy et al., 2020).

The desire to try different consumption experiences is also positively relevant for circular behaviour, as circular products and services are considered innovative, which enhances consumer satisfaction (Camacho-Otero et al., 2019; Testa et al., 2020). Furthermore, consumers who exhibit high levels of materialism may value the uniqueness of circular products (Camacho-Otero et al., 2019). Consumers can also attach themselves to physical products. Singh and Giacosa (2018) find that if a consumer develops an emotional bond with a product, they are more likely to care for the product, repair it when possible, and postpone its replacement, which eventually leads to product longevity. However, this attachment can also prevent appropriate waste disposal and culminate in unsustainable behaviour, such as hoarding (Sarigöllü et al., 2020).

Fear of contamination, disgust, and lack of trust are common factors reported by consumers engaged in business models related to sharing behaviour (D'Agostin et al., 2020; Kuah and Wang, 2020; Poppelaaresm et al., 2020) or the subsequent use of products (Calvo-Porrall and Levy-Mangin, 2020; Poppelaaresm et al., 2018). They evoke concerns about hygiene and digital safety, thus negatively impacting consumers' circular behaviour and engagement (Chamberlin and Boks, 2018).

Consumers' digital access and confidence can also affect circular behaviour. Access to digital platforms in access-based PSS, for instance, is an enabling factor for this circular behaviour (Esmailian et al., 2020), and individuals' confidence in digital services influences their attitude and, consequently, their behaviour (Tunn et al., 2020).

3.2.3.6. Products/service offer factors. The sixth category of influencing factors concerns the factors associated with how products and services are offered to consumers. The most cited factor in our SLR under this category was 'convenience'. Studies show that when the convenience of circular offerings is communicated (e.g. 'dry cleaning is on us'), consumers are more likely to perform circular behaviour (Chamberlin and Boks, 2018; Clark et al., 2020; Poppelaaresm et al., 2020). Additionally, the lack of convenience can be a barrier or an impediment for the acquisition of circular products (D'Agostin et al., 2020), the use of sharing platforms (Kuah and Wang, 2020), engagement with take-back systems (Mansuy et al., 2020), and the appropriate disposal of waste (Abuabara et al., 2019).

The existence of customer service and support was found to positively influence consumers' engagement in circular behaviour. Chamberlin and Boks (2018) and Gan and Chen (2019) indicate proving warranty, for example, as an important measure to engage customers in circular consumption systems. Poppelaaresm et al. (2018) highlight that good customer service and guidance throughout maintenance and repair processes are esteemed by individuals who adopt access-based services. Moreover, the offer of customer service and support is desirable and is found to decrease the perceived risk associated with refurbished products (van Weelden et al., 2016).

The closeness of circular offerings is also indicated as a relevant factor in engaging circular consumers. Recycling and taking-back behaviours are enhanced when collection points are closer to consumers (Abuabara et al., 2019; Botelho et al., 2016), however, when financial returns are offered, consumers may be willing to travel greater distances (Abuabara et al., 2019). Additionally, the distance of manufacturing units or logistics centres can influence circular consumer behaviour, as long delivery waiting time is perceived as unfavourable by consumers (Camacho-Otero et al., 2019).

Triggers affect circular consumption behaviour, as they positively influence consumer engagement, for example, consumers' assumption leads them to be challenged to perform a behaviour (Ackermann, 2018; Ackermann et al., 2018). Triggers can also negatively influence circular behaviour, for instance, when they suddenly dislike a product's appearance or functionality (Ackermann, 2018; Ackermann et al., 2018).

The availability of circular products and services has been identified as a relevant factor guiding the consumption of circular products. Chamberlin and Boks (2018) find that when products are easily available and consumers do not have to wait for their products, circular consumption is enhanced. Furthermore, the lack of easily available circular products, such as refurbished ones, may result in consumers not considering them when planning or performing an acquisition (van Weelden et al., 2016).

Circular offerings that focus on product access can be influenced by perceptions of ownership. Kuah and Wang et al. (2020) and Poppelaaresm et al. (2020) report that the preference for e-gadgets is a barrier to engaging on sharing platforms. Psychological ownership has also been found to inhibit the diffusion of access-based business models (Singh and Giacosa, 2018), while the communication of circular offerings as familiar/usual offerings can be used to encourage

consumers to engage with circular products and close the gap between actual ownership and consumers' expectations of ownership in clothing rental services (Chamberlin and Boks, 2018). Concerning access-based offerings, a lack of familiarity with the business model negatively influences consumer engagement (Kuah and Wang, 2020; Poppelaaresm et al., 2018), as the misunderstanding of terms and conditions and unsatisfactory compensation for consumers' sacrifice of not owning products often leads to an early rejection of the product/service. The lack of familiarity with refurbished products has also been indicated as a major cause of low consumer acceptance (van Weelden et al., 2016).

Conversely, temporary customisation of shared products was found to increase the perceived value of products, giving consumers a sense of psychological ownership, thus causing them to take better care of the products and resulting in a wider acceptance of access-based products (Tunn et al., 2019). The obsolescence of products that are going through a consecutive life was indicated by consumers as a factor that negatively influences the adoption of circular products, especially those that may have limitations with respect to their technological capabilities (van Weelden et al., 2016). To conclude this category, persuasive communication, messages shared when offering a product or service, are intended to shape, reinforce, or change behaviour, and influence consumers' beliefs, values, and attitudes, and therefore, can be used to encourage circular behaviour (Muranko et al., 2018).

3.2.3.7. Products/service-related factors. The last category identified in this SLR concerns factors related to the features of circular products and services. Product information and history, for instance, are indicated as important factors in circular business models that promote the next life of products. Visual information (e.g. signs of wear and tear) and verbal communication of prior use can lead to consumers' negative evaluations of refurbished products (Mugge et al., 2018). Conversely, a lack of information about specific information regarding the characteristics of refurbishment can keep consumers away (van Weelden et al., 2016). Other studies also indicate that positive communication and detailed information on products' prior use positively influence consumer engagement (Gan and Chen, 2019; Pisitsankhakarn and Vassanadumrongdee, 2020; Wang et al., 2020). Kuah and Wang (2020) find that a lack of information on a product or its manufacturer hinders the establishment of trust between consumers and products, while full product information transparency can drive consumers to pay higher prices for products (Shao, 2019). Moreover, the use of labels such as traffic lights indicating sustainability levels is perceived by consumers as attractive (Baier et al., 2020) and can positively influence engagement with circular products (Ferdousi and Qiang, 2016; Fogarassy et al., 2020).

The quality and performance of services and products can influence consumer behaviour, especially when positively communicated (Chamberlin and Boks, 2018). Consumer behaviour is enhanced when the perceived quality of a circular product or service is high (Gan and Chen, 2019; Machado et al., 2019; Sarigöllü et al., 2020). Consumers of recycled, refurbished, and remanufactured products perceive that their quality is inversely related to the perceived risk of purchasing these products (Kuah and Wang, 2020; van Weelden et al., 2016; Wang and Hazen, 2016). In addition to material and technological qualities, Fogarassy et al. (2020) find that consumers value organic products from small farmers because of their higher quality in terms of social responsibility. Additionally, the perception of product or material quality can increase hoarding and decrease circular flows in take-back systems (Campbell-Johnston et al., 2019; Pisitsankhakarn and Vassanadumrongdee, 2020).

The image and reliability of the product brand or service provider also influence circular consumer behaviour, such as how well they communicate their circular purpose (Chamberlin and Boks, 2018). The positive brand reputation and trustworthiness of the original manufacturer and remanufacturer can positively influence engagement with these kinds of circular products (Gan and Chen, 2019; van Weelden et al., 2016), while the low reliability of remanufacturers (Kuah and Wang,

2020) and poor image of service providers (Poppelaaresm et al., 2018) have the opposite impact. Moreover, the green image of products, that is, consumers' realisation that they are circular/sustainable, can drive their acceptance and acquisition (Calvo-Porrall and Levy-Mangin, 2020).

Designs that are functional (D'Agostin et al., 2020), unique (Gan and Chen, 2019), and evoke consumer values (Chamberlin and Boks, 2018) can enhance the acquisition of circular products or services. Furthermore, when the physical appearance of products meets consumers' aesthetic needs, their intention to purchase circular products increases (Pisitsankhakharn and Vassanadumrongdee, 2020; Wallner et al., 2020). Likewise, the employment of innovative (Gan and Chen, 2019), multifunctional (Kasulaitis et al., 2020), and fun (Poppelaaresm et al., 2018) technologies is considered by consumers, which drives them to consume circular products. However, if the consumer is not up-to-date with the technology employed, which costs an extra learning effort, then this factor can have a negative influence on engagement with circular behaviour (Camacho-Otero et al., 2019; van Weelden et al., 2016). Ease of use, not only for technological products, has been highlighted in other studies. Barbu et al. (2018) and Camacho-Otero et al. (2019) find that when a products' functionality is easy to access and fits well in consumers' domestic life, they are more likely to opt for these products. Furthermore, if a product meets consumers' needs in terms of utility, they are more likely to opt for shared or access-based products (Barbu et al., 2018). Material perception can also influence circular behaviour; for example, the awareness that a product is made of plastic and, for that reason, the consumer opts for another product (Clark et al., 2020). Moreover, the type or size of products impacts appropriate waste disposal, which is related to the burden of keeping or transporting specific types of products (Botelho et al., 2016).

4. Discussion

In the following sub-sections, we discuss the main findings of our SLR and our reflections on the features and roles of circular mindsets and behaviours and their influencing factors, and present and analyse our framework on circular consumption systems. Finally, we outline the limitations and recommendations for future research of this study.

4.1. Discussion on the systematic literature review results

This SLR focuses on mapping the elements that affect circular consumption systems, mindsets, behaviour, and their influencing factors. The CE proposes a new way to think and design business models and products and to operationalise the manufacturing and offering of goods. These innovations require changes in how organisations function daily, in the technologies and processes employed, in the required capabilities and competencies, and even in the organisational culture.

These changes also reflect how consumers perceive products and services, functionality, and value, among other features. Therefore, the transition from a linear to CE affects people's participation in consumption systems. However, our results show that little attention is paid to consumers' pre-disposition to engage with CE. Circular mindsets express an alignment between the circular value proposition and consumers' values, resulting in dispositions to engage with circular business models. Thus, we indicate the foundations of consumers' circular mindsets as follows.

- (a) Correlation to circular business models;
- (b) Envisioning of benefits for the environment, economy, and society;
- (c) Disruptiveness.

The mindsets identified in the literature show that consumers develop predispositions to specific circular offerings. It happens because each CBM has its own way of creating, delivering, and capturing value, which, consequently, is perceived differently by consumers, imposing

distinct challenges on their acceptance, engagement, and behaviour. Therefore, we advocate that there is no single unified circular consumer mindset. Nonetheless, all identified mindsets reflect CE principles by envisioning benefits for the environment, economy, and society. By favouring circular products and services, valuing material recirculation and multifunctional products, and resisting obsolescence, consumers contribute to the minimisation of resource consumption, reduction of waste generation, and regeneration of the natural environment. Furthermore, these mindsets express consumers' predisposition to engage in disruptive behaviour, walking away from consumption patterns attached to the linear model. Thus, circular mindsets express the willingness to access and use resources in new ways.

These mindsets are expressed through actual behaviour, the actions of consumers that facilitate the transactional processes in consumption systems. 14 behaviours related to circular consumption were identified. Such as circular mindsets, circular behaviour can be associated with the innovation brought about by the CE and fulfil consumers' wishes to test new business models, products, and services.

The mapped behaviour varies in how they address circularity, and in the stage of the consumption system, they can be found. Most circular behaviour is associated with more than one of these stages, thus indicating the complexity of efforts and actions across circular consumption systems. Moreover, circular behaviour can be combined throughout circular consumption systems; for example, acquiring a circular product, caring for it, and then returning it to the manufacturer at the end of its life cycle.

However, not only the combination of circular behaviours but also their continuation throughout the consumption systems creates a circular consumption system. The circulation of resources and minimisation of resource usage can be promoted by single one-off circular behaviours such as waste separation, reuse, and recycling. We believe that systems which are designed to be circular from the start and the engagement of consumers with such systems in the early stages can promote greater positive environmental, social, and economic impacts. Nevertheless, single behaviours that endorse the return of resources to use and maintain some of their value in the system should not be neglected.

The final step of our SLR was the identification of the factors that positively or negatively influence circular mindsets and behaviour. In the CE literature, we identified 54 factors, which were classified into 7 categories according to their domain. Some categories have received greater attention from the literature, indicating, for example, the number of factors identified, that is, consumer-related, product/service offer, and product/service related, or the number of publications which addressed the factors under these categories, that is, economic and demographic factors. Conversely, studies on political, legal, and environmental factors and their influence on consumer behaviour are very limited in the CE literature, thus indicating that there are opportunities to expand research in these fields.

Nonetheless, many different aspects, from macro-level forces to the availability of a product, can influence how a consumer acts upon their dispositions towards a circular offering. This result shows that the factors that influence consumer acceptance and engagement are extremely diverse. Strategies and interventions which aim to boost consumer engagement should focus on the hard or soft sides of the CE and consumer behaviour, and on a combination of aspects. As important as it is to guarantee a product's quality or offer great customer service, consumers' environmental awareness or attachment to a product, for example, should be equally considered when designing circular offerings. However, greater generalisation should not be established without further investigation. We believe that this list of factors is helpful for researchers and practitioners who wish to narrow their focus, map relevant studies, and evaluate appropriate factors for their research or application context.

4.2. Circular consumption system framework

Through SLR, we were able to map important elements that guide consumers' acceptance, adoption, and engagement with circular products

and services. These elements, namely mindsets, behaviour, and influencing factors, compose the circular consumption system. However, our SLR shows that the CE literature lacks a framework that shows the integration of these elements and how they, combined, can boost consumer participation in circular systems and consequently enhance the success of circular initiatives. Therefore, we propose a framework that positions these elements along with structural elements and transaction processes in circular consumption systems (Fig. 4).

The circular consumption system is the arrangement of circular consumption stages through which the flow of structural elements (circular products and services) occurs through transactional processes (chained activities performed via consumer behaviour). The consumer, an active actor in a successful circular consumption system, holds dispositions to engage with circular products/services. These mindsets are expressed through behaviour that allows the flow of products in these systems, which, in turn, are affected by influencing factors, among the seven groups identified in the SLR.

We suggest that circular mind-sets are the starting point for understanding the consumer's context. They represent consumers' first impressions of circular products and services, their perception of the value offered by the CE, and the extent to which they are disposed to engage in circular consumption systems. Therefore, circular mindsets are the first component of our theoretical framework, and the first to be mapped and understood when designing these systems.

After understanding and mapping circular mindsets, designers of circular consumption systems should identify the behaviour they want to promote, and the linear behaviour they wish to discourage, in all phases of the consumption chain. The next step is to discern what influences boost or hinder these behaviours and mindsets, namely, the influencing factors. These aspects, previously classified into seven groups by our framework, illustrate the complexity of designing, altering, and intervening in circular consumption systems. When defining a circular strategy, organisations must be aware that many factors can influence their actual and potential customers, which can be translated into whether and how consumers will engage with their circular

initiative. Accordingly, by mapping consumers' mindsets and identifying desirable circular behaviour, the factors that can influence them become clearer.

Our research indicates that, by integrating all these elements, it is possible to achieve a comprehensive analysis of circular consumption. Moreover, by relying on the understanding of circular business models, circular products and services, and consumers' psychological and contextual aspects, organisations can overcome challenges and exploit opportunities that can be translated into circular consumption behaviour and engagement.

4.3. Limitations and future research

Although this study is firmly grounded in CE literature, we indicate a limitation concerning the strings used in the SLR. The use of broader terms, such as 'closed-loop economy' or 'cradle-to-cradle' could have resulted in a wider set of data collected. Furthermore, we limited our search to articles published in peer-reviewed journals. Other types of documents, such as conference papers, could provide additional results to this SLR; however, we believe that this addition could have compromised the quality of this research.

Additionally, even though some of the analysed studies presented statistical/quantitative results concerning the influence of some factors on circular behaviours, we were unable to provide meta-analyses. Often, the methodologies, theories, and context of the study were not the same, thus preventing the generalisation of results.

5. Conclusions

Consumers' circular mindsets express their pre-disposition to engage with circular products and services, and present a disruption in linear behavioural patterns and an alignment with circular principles. However, consumers' mindsets depend on which CBM is addressed by organisations and brands. Consumers' circular behaviours can also depend on the type of product and offering, and their participation in

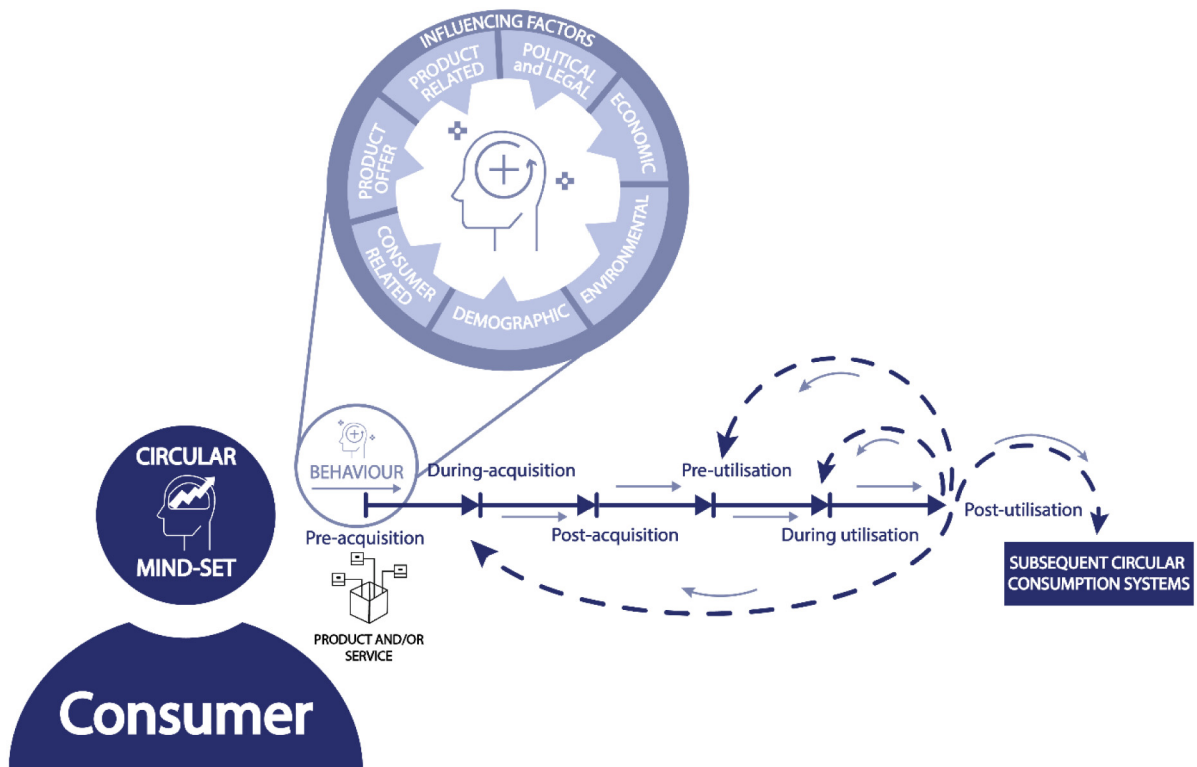


Fig. 4. Theoretical framework - circular consumer mind-sets, behaviour and influencing factors in circular consumption systems.

consumption systems can be combined with other circular behaviours throughout the many stages of the system, or even as a single one-off behaviour. Either way, these circular behaviours promote the flow of products and resources in circular systems.

Additionally, we established that mindsets and behaviour are influenced by several factors in seven domains. These factors have been reported in the literature in specific contexts. Some highly cited factors such as price and environmental awareness presented similar considerations. Overall, consumers reject the products and services they perceive as overpriced; the greater the consumers' environmental awareness, the greater the chance that they engage in circular consumption systems. However, for most of the factors we mapped, generalisation was not possible.

We also found that circular consumption systems rely on consumers' circular mindset and are expressed by circular behaviour, which, in turn, is influenced by sets of intrinsic and extrinsic factors. This study presents a theoretical framework that combines these elements and their interrelations to allow the flow of products, services, and resources through circular consumption systems.

As for the implications for research and practice, we believe that our results can help academics position their research in the existing literature, explore existing findings, and fill the gaps identified. Furthermore, organisations and brands wishing to transition to a CE can use our results and framework to better comprehend the challenges concerning consumer behaviour, that is, understand their consumers' circular dispositions and behaviour, discern consumers' context and individual features, and distinguish the characteristics related to the product/service that fit their consumers' expectations.

For future research, we indicate continued updates on this SLR; as this field gains traction, more countries commit to becoming circular, and more data become available. Moreover, there is a lack of research on consumer behaviour concerning some CBM, such as dematerialisation and digitalisation, which could be addressed by future research. Finally, a structured framework to guide behavioural change among circular consumers should be developed to help businesses implement a CE.

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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References

Abuabara, L., Paucar-Caceres, A., Burrowes-Cromwell, T., 2019. Consumers' values and behaviour in the Brazilian coffee-in-capsules market: promoting circular economy. *Int. J. Prod. Res.* 57 (23), 7269–7288. <https://doi.org/10.1080/00207543.2019.1629664>.

Ackermann, L., 2018. Design for product care: enhancing consumers' repair and maintenance activities. *Des. J.* 21 (4), 543–551. <https://doi.org/10.1080/14606925.2018.1469331>.

Ackermann, L., Mugge, R., Schoormans, J. P. L., 2018. Consumers' perspective on product care: an exploratory study of motivators, ability factors, and triggers. *J. Clean. Prod.* 183, 380–391. <https://doi.org/10.1016/j.jclepro.2018.02.099>.

Baier, D., Rausch, T.M., Wagner, T.F., 2020. The drivers of sustainable apparel and sportswear consumption: a segmented Kano perspective. *Sustainability* 12 (7). <https://doi.org/10.3390/su12072788>.

Barbu, C.M., Florea, D., Ocarca, R.F., Barbu, M., 2018. From ownership to access: how the sharing economy is changing the consumer behavior. *Amfiteatru Economic* 20 (48), 373–387. <https://doi.org/10.24818/EA/2018/48/373>.

Bertassini, A.C., Ometto, A.R., Severengiz, S., Gerolamo, M.C., 2021. Circular economy and sustainability: the role of organizational behaviour in the transition journey. *Bus. Strateg. Environ.* 1–34. <https://doi.org/10.1002/bse.2796>.

Blomsma, F., Brennan, G., 2017. The emergence of circular economy. *J. Ind. Ecol.* 21 (3), 603–614. <https://doi.org/10.1111/jieec.12603>.

Botelho, A., Dias, M.F., Ferreira, C., Pinto, L.M.C., 2016. The market of electrical and electronic equipment waste in Portugal: analysis of take-back consumers' decisions. *Waste Manag. Res.* 36 (10), 1074–1080. <https://doi.org/10.1177/0734242X16658546>.

BSI – British Standards Institution. BS 8001, 2017. *Framework for Implementing the Principles of the Circular Economy in Organizations – Guide*. The British Standards Institution, London.

Calvo-Porral, C., Levy-Mangin, J.P., 2020. The circular economy business model: examining consumers' acceptance of recycled goods. *Adm. Sci.* 10 (2). <https://doi.org/10.3390/admsci10020028>.

Camacho-Otero, J., Boks, C., Pettersen, N., 2018. Consumption in the circular economy: a literature review. *Sustainability* 10 (8). <https://doi.org/10.3390/su10082758>.

Camacho-Otero, J., Boks, C., Pettersen, N., 2019. User acceptance and adoption of circular offerings in the fashion sector: Insights from user-generated online reviews. *Journal of Cleaner Production* 231, 239–928. <https://doi.org/10.1016/j.jclepro.2019.05.162>.

Campbell-Johnston, K., ten Cate, J., Elfering-Petrovic, M., Gupta, J., 2019. City level circular transitions: barriers and limits in Amsterdam, Utrecht and the Hague. *J. Clean. Prod.* 235, 1232–1239. <https://doi.org/10.1016/j.jclepro.2019.06.106>.

Chamberlin, L., Boks, C., 2018. Marketing approaches for a circular economy: using design frameworks to interpret online communication. *Sustainability* 10, 2070. <https://doi.org/10.3390/su10062070>.

Clark, N., Trimmingham, R., Wilson, G.T., 2020. Incorporating consumer insights into the UK food packaging supply chain in the transition to a circular economy. *Sustainability* 12 (15). <https://doi.org/10.3390/su12156106>.

Conforto, E.C., Amaral, D.C., Silva, S.L., 2011. Roteiro para revisão bibliográfica sistemática: aplicação no desenvolvimento de produtos e gerenciamento de projetos. 8° Congresso Brasileiro de Gestão de Desenvolvimento de Produto – CBGDP, Porto Alegre.

D'Agostin, A., Medeiros, J.F., Vidor, G., Zulpo, M., Moretto, C.F., 2020. Drivers and barriers for the adoption of use-oriented product-service systems: A study with young consumers in medium and small cities. *Sustainable Production and Consumption* 21, 92–103. <https://doi.org/10.1016/j.spc.2019.11.002>.

Daae, J., Chamberlin, L., Boks, C., 2018. Dimensions of behaviour change in the context of designing for a circular economy. *Des. J.* 21 (4), 521–541. <https://doi.org/10.1080/14606925.2018.1468003>.

Dweck, C.S., 2017. *Mindset. A nova psicologia do sucesso*. Objetiva, Rio de Janeiro.

EMF – Ellen MacArthur Foundation, 2017. *Concept*. <https://www.ellenmacarthurfoundation.org/>. (Accessed 12 December 2020).

EMF – Ellen MacArthur Foundation, 2018. *The Circular Design Guide: Mindsets*. <https://www.circulardesignguide.com/mindset>. (Accessed 15 November 2020).

Esmailian, B., Sarkis, J., Lewis, K., Behdad, S., 2020. Blockchain for the future of sustainable supply chain management in industry 4.0. *Resources Conservation & Recycling* 163. <https://doi.org/10.1016/j.resconrec.2020.105064>.

Feng, Z., Xiao, T., Robb, D.J., 2021. Environmentally responsible closed-loop supply chain models with outsourcing and authorization options. *J. Clean. Prod.* 278. <https://doi.org/10.1016/j.jclepro.2020.123791>.

Ferdousi, F., Qiang, D., 2016. Implementing circular economy and its impact on consumer ecological behavior. *Journal on Innovation and Sustainability* 7 (1). <https://doi.org/10.24212/2179-3565.2016v7i1p3-10>.

Fogarassy, C., Nagy-Pércsi, K., Ajibade, S., Gyuricza, C., Ymeri, P., 2020. Relations between circular economic “principles” and organic food purchasing behavior in Hungary. *Agronomy* 10 (5). <https://doi.org/10.3390/agronomy10050616>.

Gan, Q., Chen, S., 2019. Assessing consumers' motivations for purchasing remanufactured products. *Kybernetes* 49 (9), 2221–2240. <https://doi.org/10.1108/K-03-2019-0206>.

Gazzola, P., Pavione, E., Pezzetti, R., Grechi, D., 2020. Trends in the fashion industry. The perception of sustainability and circular economy: a gender/generation quantitative approach. *Sustainability* 12 (7).

Geissdoerfer, M., Savaget, P., Bocken, N.M.P., Hultink, E.J., 2017. The circular economy – a new sustainability paradigm? *J. Clean. Prod.* 143, 757–768. <https://doi.org/10.1016/j.jclepro.2016.12.048Get>.

Ghisellini, P., Cialani, C., Ulgiati, S., 2016. A review on circular economy: the expected transition to a balanced interplay of environmental and economic systems. *J. Clean. Prod.* 114, 11–32. <https://doi.org/10.3390/su12072809>.

Guo, B., Geng, Y., Sterr, T., Zhu, Q., Liu, Y., 2017. Investigating public awareness on circular economy in western China: a case of Urumqi midong. *J. Clean. Prod.* 142, 2177–2186. <https://doi.org/10.1016/j.jclepro.2016.11.063>.

Haas, W., Krausmann, F., Wiedenhofer, D., Heinz, M., 2015. How circular is the global economy? An assessment of material flows, waste production, and recycling in the European Union and the world in 2005. *Journal of Industrial Ecology* 19 (5), 765–777. <https://doi.org/10.1111/jieec.12244>.

Haines-Gadd, M., Chapman, J., Lloyd, P., Mason, J., Aliakseyeu, D., 2018. Emotional durability design Nine—a tool for product Longevity. *Sustainability* 10 (6). <https://doi.org/10.3390/su10061948>.

Hazen, B.T., Mollenkopf, D.A., Wang, Y., 2016. Remanufacturing for the circular economy: an examination of consumer switching behavior. *Bus. Strateg. Environ.* 16 (4), 451–464. <https://doi.org/10.1002/bse.192>.

Kasulaitis, B., Babbitt, C.W., Tyler, A.C., 2020. The role of consumer preferences in reducing material intensity of electronic products. *J. Ind. Ecol.* 1–13. <https://doi.org/10.1111/jieec.13052>.

Kirchherr, J., Hekkert, M., Bour, R., Huibrechtse-Truijens, A., Kostense-Smit, E., Muller, J., 2017. *Breaking the Barriers to the Circular Economy*. Utrecht University, Utrecht, The Netherlands.

- Kitchenham, B.A., 2004. *Procedures for Undertaking Systematic Reviews*. Joint Technical Report. Computer Science Department, Keele University (TR/SE-0401) and National ICT Australia Ltd 0400011T.1.
- Kuah, A.T.H., Wang, P., 2020. Circular economy and consumer acceptance: an exploratory study in east and Southeast Asia. *J. Clean. Prod.* 247. <https://doi.org/10.1016/j.jclepro.2019.119097>.
- Lakatos, E.S., Dan, V., Cioca, L.I., Bacali, L., Ciobanu, A.M., 2016. How supportive are Romanian consumers of the circular economy concept: a survey. *Sustainability* 8 (8). <https://doi.org/10.3390/su8080789>.
- Lakatos, E.S., Cioca, L.I., Dan, V., Ciomos, A.O., Crisan, O.A., Barsan, G., 2018. Studies and investigation about the attitude towards sustainable production, consumption and waste generation in line with circular economy in Romania. *Sustainability* 10 (3). <https://doi.org/10.3390/su10030865>.
- Lebel, L., Lorek, S., 2008. Enabling sustainable production-consumption systems. *Annu. Rev. Environ. Resour.* 33, 241–275. <https://doi.org/10.1146/annurev.enviro.33.022007.145734>.
- Machado, M.A.D., Almeida, S.O., Bollick, L.C., Bragagnolo, G., 2019. Second-hand fashion market: consumer role in circular economy. *J. Fash. Mark. Manag.* 23 (3), 382–395. <https://doi.org/10.1108/JFMM-07-2018-0099>.
- Mansuy, J., Verlinde, S., Macharis, C., 2020. Understanding preferences for EEE collection services: a choice-based conjoint analysis. *Resour. Conserv. Recycl.* 161. <https://doi.org/10.1016/j.resconrec.2020.104899>.
- Mashhadi, A.R., Vedantam, A., Behdad, S., 2019. Investigation of consumer's acceptance of product-service-systems: A case study of cell phone leasing. *Resources, Conservation & Recycling* 143, 36–44. <https://doi.org/10.1016/j.resconrec.2018.12.006>.
- Mugge, R., Jong, W., Person, O., Hultink, E.J., 2018. 'If it Ain't broke, Don't explain It': the influence of visual and verbal information about prior use on consumers' evaluations of refurbished electronics. *Des. J.* 21 (4), 499–520. <https://doi.org/10.1080/14606925.2018.1472856>.
- Muranko, Z., Andrews, D., Newton, E.J., Chaer, I., Proudman, P., 2018. The pro-circular change model (P-CCM): proposing a framework facilitating behavioural change towards a circular economy. *Resour. Conserv. Recycl.* 135, 132–140. <https://doi.org/10.1016/j.resconrec.2017.12.017>.
- Muranko, Z., Andrews, D., Chaer, I., Newton, E.J., 2019. Circular economy and behaviour change: using persuasive communication to encourage pro-circular behaviours towards the purchase of remanufactured refrigeration equipment. *J. Clean. Prod.* 222, 499–510. <https://doi.org/10.1016/j.jclepro.2019.02.219>.
- Muranko, Z., Aurisicchio, M., Baxter, W., Childs, P., 2020. *Behaviour chains in circular consumption systems: the reuse of FMCGs*. IS4CE2020 Conference of the International Society for the Circular Economy, Exeter.
- Murray, A., Skene, K., Haynes, K., 2017. The circular economy: an interdisciplinary exploration of the concept and application in a global context. *J. Bus. Ethics* 140 (3), 369–380. <https://doi.org/10.1007/s10551-015-2693-2>.
- Nenckova, L., Pecakova, I., Sauer, P., 2020. Disposal behaviour of Czech consumers towards textile products. *Waste Manag.* 106, 71–76. <https://doi.org/10.1016/j.wasman.2020.03.001>.
- Nowakowski, P., 2019. Investigating the reasons for storage of WEEE by residents – a potential for removal from households. *Waste Manag.* 87, 192–203. <https://doi.org/10.1016/j.wasman.2019.02.008>.
- Page, M.J., McKenzie, J.E., Bossuyt, P.M., Boutron, I., Hoffmann, T.C., Mulrow, C.D., et al., 2021. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 372, 71. <https://doi.org/10.1136/bmj.n71>.
- Park, J., Sarkis, J., Wu, Z., 2010. Creating integrated business and environmental value within the context of China's circular economy and ecological modernization. *J. Clean. Prod.* 18 (15), 1494–1501. <https://doi.org/10.1016/j.jclepro.2010.06.001>.
- Patti, S., 2017. *Economics and policy of energy and the environment*. *Econ. Policy Energy Environ.* 1, 219–234.
- Pisitsankhakharn, R., Vassanadumrongdee, S., 2020. Enhancing purchase intention in circular economy: an empirical evidence of remanufactured automotive product in Thailand. *Resour. Conserv. Recycl.* 156. <https://doi.org/10.1016/j.resconrec.2020.104702>.
- Poppelaersm, F., Bakker, C., van Engelen, J., 2018. Does access trump Ownership? Exploring consumer acceptance of access-based consumption in the case of smartphone. *Sustainability* 10 (7). <https://doi.org/10.1016/j.jclepro.2018.03.261>.
- Poppelaersm, F., Bakker, C., van Engelen, J., 2020. Design for divestment in a circular economy: stimulating voluntary return of smartphones through design. *Sustainability* 12 (4). <https://doi.org/10.3390/su12041488>.
- Prieto-Sandoval, V., Jaca, C., Ormazabal, M., 2018. Towards a consensus on the circular economy. *J. Clean. Prod.* 179, 605–615. <https://doi.org/10.1016/j.jclepro.2017.12.224>.
- Ritzén, S., Sandström, G.Ö., 2017. Barriers to the circular economy – integration of perspectives and domains. The 9th CIRP IPSS Conference: Circular Perspectives on Product/Service-Systems, Copenhagen <https://doi.org/10.1016/j.procir.2017.03.005>.
- Russo, I., Confente, I., Scarpi, D., Hazen, B.T., 2019. From trash to treasure: the impact of consumer perception of bio-waste products in closed-loop supply chains. *J. Clean. Prod.* 218, 966–974. <https://doi.org/10.1016/j.jclepro.2019.02.044>.
- Sarigöllü, E., Hou, C., Ertz, M., 2020. Sustainable product disposal: consumer redistributing behaviors versus hoarding and throwing away. *Bus. Strateg. Environ.* 1–17. <https://doi.org/10.1002/bse.2624>.
- Shao, J., 2019. Sustainable consumption in China: new trends and research interests. *Bus. Strateg. Environ.* 28 (8), 1507–1517. <https://doi.org/10.1002/bse.2327>.
- Singh, P., Giacosa, E., 2018. Cognitive biases of consumers as barriers in transition towards circular economy. *Manag. Decis.* 57 (4), 921–936. <https://doi.org/10.1108/MD-08-2018-0951>.
- Sun, H., Ni, W., Wang, Z., 2016. A consumption system model integrating quality, satisfaction and behavioral intentions in online shopping. *Inf. Technol. Manag.* 17, 165–177. <https://doi.org/10.1007/s10799-015-0254-0>.
- Testa, F., Iovino, R., Iraldo, F., 2020. The circular economy and consumer behaviour: the mediating role of information seeking in buying circular packaging. *Bus. Strateg. Environ.* 1–14. <https://doi.org/10.1002/bse.2587>.
- Tong, X., Nikolic, I., Dijkhuizen, Van Den, Hoven, M., Minderhoud, M., Wackerlin, N., Wang, T., Tao, D., 2018. Behaviour change in post-consumer recycling: applying agent-based modelling in social experiment. *J. Clean. Prod.* 187, 1006–1013. <https://doi.org/10.1016/j.jclepro.2018.03.261>.
- Tunn, V.S.C., Fokker, R., Luijckx, K.A., Jong, S.A.M., Schoormans, J.P.L., 2019. Making ours mine: increasing consumer acceptance of access-based PSS through temporary product customisation. *Sustainability* 11 (1). <https://doi.org/10.3390/su11010274>.
- Tunn, V.S.C., van den Hende, E.A., Bocken, N.M.P., Schoormans, J.P.L., 2020. Digitalised product-service systems: effects on consumers' attitudes and experiences. *Resour. Conserv. Recycl.* 162. <https://doi.org/10.1016/j.resconrec.2020.105045>.
- van der Laan, A.Z., Aurisicchio, M., 2019. Archetypical consumer roles in closing the loops of resource flows for fast-moving consumer goods. *J. Clean. Prod.* 236. <https://doi.org/10.1016/j.jclepro.2019.06.306>.
- van Weelden, E., Mugge, R., Bakker, C., 2016. Paving the way towards circular consumption: exploring consumer acceptance of refurbished mobile phones in the dutch market. *J. Clean. Prod.* 113, 743–754. <https://doi.org/10.1016/j.jclepro.2015.11.065>.
- Wallner, T.S., Magnier, L., Mugge, R., 2020. An exploration of the value of timeless design styles for the consumer acceptance of refurbished products. *Sustainability* 12 (3). <https://doi.org/10.3390/su12031213>.
- Wang, Y., Hazen, B.T., 2016. Consumer product knowledge and intention to purchase remanufactured products. *Int. J. Prod. Econ.* 181, 460–469. <https://doi.org/10.1016/j.ijpe.2015.08.031>.
- Wang, P., Kuah, A.T.H., 2018. Green marketing cradle-to-cradle: remanufactured products in Asian markets. *Thunderbird International Business Review* 60 (5). <https://doi.org/10.1002/tie.21925>.
- Wang, Y., Zhu, Q., Krikke, H., Hazen, B., 2020. How product and process knowledge enable consumer switching to remanufactured laptop computers in circular economy. *Technol. Forecast. Soc. Chang.* 161. <https://doi.org/10.1016/j.techfore.2020.120275>.
- Wasting, T., Charnley, F., Moreno, M., 2018. Design for circular behaviour: considering users in a circular economy. *Sustainability* 10 (6). <https://doi.org/10.3390/su10061743>.
- Woodside, A.G., Dubelaar, C., 2002. A general theory of tourism consumption systems: a conceptual framework and an empirical exploration. *J. Travel Res.* 41 (2), 120–132. <https://doi.org/10.1177/004728702237412>.