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Sustainability-oriented commerce innovation: How does it influence consumer satisfaction?

ABSTRACT

Purpose: Innovation and sustainability are two key factors for retailers seeking a competitive advantage. However, the way in which the joint effect of both of these variables impacts consumer satisfaction is still unknown. To address this gap, based on the concept of sustainability-oriented service innovation (SOSI), we introduce a new construct named sustainability-oriented commerce innovation (SOCI) in the context of the retail sector.

Design/methodology/approach: The relationships between the variables defined in this research were examined using a structural equations model for 510 customers of grocery retail establishments.

Findings: We find support for a direct positive impact of SOCI on customer satisfaction and an indirect impact through store equity. These chained effects are modified according to the client participation in the development of sustainable and innovative initiatives.

Originality/value: This research analyses the joint effect of innovation and sustainability in the retail context by introducing a new concept – SOCI – and a scale for its measurement whose psychometric properties are validated.

Keywords: Innovation, sustainability, SOCI, store equity, co-creation, satisfaction, retail.

1. Introduction

Recent literature identifies two key elements in the development of competitive advantage for retailers: innovation (Sorescu, 2011; Hristov and Reynolds, 2015; Pantano and Vannucci, 2019) and sustainability (Wiese *et al.*, 2012; Vadakkepatt *et al.*, 2021; Johansson, 2022). Service innovativeness is key in explaining retail attractiveness (Pilawa *et al.*, 2022) and sustainability plays a role in the consumer experience (Elg and Welinder, 2022). There is evidence of the positive influence of both sustainability and innovation on classic variables in marketing research, such as consumer satisfaction (Lüdeke-Freund *et al.*, 2017), store perceived quality (Marín-García *et al.*, 2020) and brand equity (Huang *et al.*, 2016).

In the context of retail, innovation is understood as all those changes that occur in products, firm organisation and commercial activities which allow the development of markets (Stagnaro, 2017). In addition, from the consumer perspective, which is the approach assumed in this research, the conception of innovation is based on three aspects: product, marketing, and relational innovation (Marín-García *et al.,* 2020). In turn, sustainability in retailing is a fundamental variable made up of economic, social and environmental factors (Lavorata, 2014), in line with Elkington (2004).

However, despite the research opportunity that this field of study represents (Ta and Yang, 2018), as far as the authors are aware, there are no contributions that examine the joint effect that innovation and sustainability can exert on store perception and consumer attitude towards retailers. In this vein, the retail literature has still not taken into consideration the synergies that may stem from analysing innovation and sustainability from a holistic perspective. Because the whole is different from its constituent parts (Stoyanov, 2022), we need to better understand how the synergy between sustainability and innovation influences consumer satisfaction in retail. Indeed, it remains unclear how consumers react when retailers implement sustainable innovations or introduce practices combining innovation and sustainability. For instance, how do consumers react when retailers offer innovative fair trade products, incorporate chargers for electric cars, or increase the spaces reserved to park bicycles or electric scooters?

To address this gap in the retail literature, we take into consideration the concept of “sustainability-oriented service innovation (SOSI)” (Calabrese *et al.*, 2018a, 2018b). This approach involves making deliberate changes to the elements that have traditionally been part of innovation (products, processes, organisations, and relationships) to generate environmental, social, and economic value, the vertices on which sustainability is structured (Watson *et al.,* 2020; Calabrese *et al.,* 2021). In line with this new wave of research on SOSI, and beyond the independent effect caused by innovation and/or sustainability (Lavorata, 2014; Marín-García *et al.,* 2020), the aim of this research is to take one step further in comparison to the extant literature to analyse the combined and joint effect of innovation and sustainability in the retail context by introducing a new concept that we have named SOCI, or sustainability-oriented commerce innovation (SOCI). In particular, we have adopted the perspective of the consumer, assuming that innovation is built through product, marketing and relational innovation; and, that sustainability is composed of three dimensions: economic sustainability, social sustainability and environmental sustainability.

2. Theoretical background

2.1. Retail, innovation, and sustainability

In recent years, the topic of sustainability has gained prominence in many retail sectors. Sustainability is a key element for retailers who have seen that sustainable development could become an important source of competitive advantage. In spite of the interest in sustainability in the literature, there has been much debate over its conceptualisation. A widely cited definition of sustainability is that proposed by the Brundtland Commission, i.e., 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (Brundtland, 1987, p. 40). Moreover, innovation is also postulated to be one essential element for the development of competitive advantages in companies. In retailing, innovation has been widely identified as a particularly important factor for the survival and growth of companies (Reinartz et *al.,* 2011; Grewal *et al.,* 2017; Stagnaro, 2017; Marín-García *et al.,* 2020). More specifically, Reinartz et *al.* (2011) highlight the key role of innovations in retail to turn challenges into opportunities and thus improve the competitiveness of retailers, particularly in mature markets. This vision is shared by investors, in view of the ability of retail service innovations implemented by publicly listed retailers to create shareholder value, as evidenced in the findings of Lamey *et al.* (2021).

Sustainability and innovation have received much attention in the retail context in recent years (Wiese *et al.,* 2012; Hristov and Reynolds, 2015; Pantano and Vannucci, 2019; Marín-García *et al.*, 2020; Johansson, 2022). Specifically, sustainable practices generate positive impacts for retailers (Ruiz-Real *et al.*, 2018). In addition, Vadakkepatt *et al.* (2021) highlight that retailers can justify a focused approach to social issues throughout the supply chain. Regarding innovation, its conceptualisation in retail is not clearly defined, due to the multitude of approaches and the various developments in measurement scales (Hristov and Reynolds, 2014). Along these lines, Sorescu *et al.* (2011) highlight a business model to guide innovations in the retail context, proposing that innovations are best viewed as changes in three design components: (1) the way in which the activities are organised, (2) the type of activities that are executed, and (3) the level of participation of the actors engaged in performing those activities. However, innovations in business models in retail present greater obstacles stemming from radical changes that affect their markets, due to the strong competition and the expectations of consumers, who are increasingly difficult to impress (Hristov and Reynolds, 2014). Therefore, sustainability emerges as a key element in the configuration of new business models (Bilińska-Reformat *et al*., 2019). Thus, the existing literature defines innovative business models aligned with sustainability, that is, innovations that can generate a negative or positive impact on the environment and/or society (Reinartz *et al.,* 2011). In this way, the relationship between innovation and sustainability will allow, among other aspects, an increase in the competitiveness of companies (Sorescu *et al.*, 2011) through cost reduction and a better response to market needs, thus increasing consumer satisfaction. Indeed, Bouhia (2022) claims that large retailers are likely to have a key role in the transition toward a more sustainable economy, although it recognises the challenges faced in their attempt to apply innovation in developing a sustainable business model.

Moreover, the main proposals focused on innovation and sustainability in retail demonstrate the need to further develop a global concept that, starting from the main types of innovation identified in the literature from the consumer's perspective (product innovation, marketing innovation, and relational innovation), include the three pillars of sustainability (economic, social, and environmental), as proposed by Elkington (2018). However, Elkington (2018) notes that his model, known as the triple bottom line (TBL), has mostly been interpreted as an accounting tool. Yet, the author points out that companies should be configured around TBL principles to improve the well-being of people and the health of the planet.

Overall, the studies in the area of retailing advocate the launch of new or improved products and services that are more environmentally-friendly, the reduction of materials and consumption in their development, and partnerships between retail companies and non-profit organisations, among other aspects (Marín-García *et al.,* 2020). Many studies have tried to examine the concepts of innovation and sustainability as independent variables (Grewal *et al.,* 2017; Bilińska-Reformat *et al.,* 2019; Marín-García *et al.,* 2020) without considering the synergies that can be derived by analysing them from a holistic perspective. Because we need to better understand how the synergy between sustainability and innovation influences consumer satisfaction in retail, the present research aims to assess the joint impact that innovation and sustainability may exert on consumer behaviour in a retail setting. To address this gap, we adopt the concept of "sustainability-oriented service innovation" (SOSI) (Calabrese *et al.*, 2018a, 2018b, 2021).

2.2. Sustainability-oriented service innovation

The service marketing literature stresses the importance of examining sustainability and innovation together. The interconnections and synergies between innovation and sustainability in the field of services justify the emergence of the concept "sustainability-oriented service innovation" (SOSI) (Calabrese *et al.*, 2018a, 2018b). This concept combines various converging streams of study, namely: product-service system (PSS), sustainability-oriented innovation (SOI), and service innovation (SI).

Firstly, PSS is understood as the means by which organisations are able to offer a set of additional services and products with the main objective of obtaining a benefit greater than that which they would achieve if they only offered the product (Calabrese *et al.*, 2021). Underlying this approach is the purpose of generating additional value through services to stand up to fierce competition (Negash *et al.*, 2021). Following this perspective, it is not feasible to achieve consumer satisfaction only through the process of purchasing goods and, therefore, the services added to the companies' offer are essential for its achievement.

Secondly, SOI highlights the importance of the transformation in production processes, structural changes in companies, or the way in which companies relate to consumers in a more sustainable way to create added value (Watson, 2020).

Finally, SI is seen as a multidimensional concept made up of different kinds of innovations to improve the services that organisations offer, both for consumers and for their employees (Gustafsson *et al.*, 2020). These innovations can be technological – i.e. product innovations and process innovations – and non-technological – i.e. organisational innovations and relational innovations – (Janssen and Castaldi, 2018). Although to date no great progress has been made in this line of research from the perspective of sustainability, the literature indicates that its future path may be far-reaching (Preghenella and Battistella, 2021).

Calabrese *et al.* (2018a) point out that SOSI does not completely replace or merge the fields that make up SOI, SI and PSS, but rather advocates the relevance of these guidelines to develop SOSI as an area of study that is understood as "a new field of research focused explicitly on both service innovation and sustainability, and characterised by a holistic approach to innovation, involving various factors and stakeholders" (Calabrese *et al.*, 2018b, p. 283). Along these lines, analysis of it can become an independent research current, with its own characteristics according to sectors. For this reason, this paper proposes a definition of SOSI in the context of retail, evaluating its scope from the consumer's perspective.

2.3 From SOSI to SOCI (sustainability-oriented commerce innovation)

The concept of SOSI and its effects are becoming especially relevant in retailing (Marín-García *et al.*, 2020; Watson *et al.*, 2020). Indeed, despite the fact that these elements had traditionally been studied as two independent variables in this field of study (Lavorata, 2014; Lin, 2015; Lüdeke-Freund *et al.*, 2017; Moliner-Velázquez *et al.*, 2019), in recent years, particular emphasis has been placed on underlining the urgency of observing them in a coordinated and joint manner (Marín-García *et al.*, 2020), taking a holistic approach.

Moreover, despite the calls for research, there is no work that defines the connections between innovation and sustainability in retail under the same concept. In this way, "sustainability-oriented commerce innovation (SOCI)" is shown as a field of research focused explicitly on both innovation and sustainability in retail, and characterised by a holistic approach to innovation, involving various factors and stakeholders. Furthermore, it is observed as a multidimensional concept that captures various elements of innovative retail solutions by addressing issues of environmental, social, and economic sustainability, thus defining the domain of the construct, its nature and scope.

Finally, in order to have a better understanding of the literature, Table 1 presents the results of studies using the concepts of innovation, sustainability and SOSI in the retail industry and general fields.

Table 1. Contributions of our research within the retail and SOSI literatures

Author/s	Dimensions	Research field	Results
Retail literature			
Reinartz *et al*. (2011)	Product innovation Process innovation Marketing innovation	Retail	Innovation is understood as a way to successfully transform tough market conditions into opportunities for retailers.
Sorescu *et al.* (2011)	Organizational innovation	Retail	Innovations are the result of changes in the way activities are organised and the level of involvement of members engaged in those activities.
Lavorata (2014)	Economic sustainability Social sustainability Environmental sustainability	Retail	Consisting of economic, social and environmental factors, sustainability enables companies to achieve competitive advantages.
Grewal *et al.* (2017)	Marketing innovation Relational innovation Organizational innovation	Retail	Retailers must enable their business models to evolve and create seamless shopping experiences and offers.
Ruiz-Leal *et al.* (2019)	Economic sustainability Social sustainability Environmental sustainability	Retail	Sustainability is a key element for retailers, who have seen that sustainable development can become an important source of competitive advantage.
Marín-García *et al*. (2020)	Product innovation Process innovation Marketing innovation Economic sustainability Social sustainability Environmental sustainability	Retail	Separately, innovation and sustainability influence positively the main dimensions of brand value
Compared to retail literature, the current research shows the synergy effect of innovation and sustainability on store equity and consumer satisfaction, taking into account the whole effect instead of the different effects of parts. Our findings also highlight the mediating role of store equity and reveal the moderating role of the consumer co-creation.			
SOSI literature			
Calabrese *et al.* (2018a)	SOSI	General	The SOSI tool helps managers and entrepreneurs recognise which component of their companies' business model to trigger SOSI and how to blossom this type of innovation.
Calabrese *et al.* (2018b)	SOSI	Mobility service	A new field of research focused explicitly on both service innovation and sustainability, and characterised by a holistic approach to innovation, involving various factors and stakeholders

Wikhamn (2019)	SOSI	Hospitality	Sustainable human resources practices enhance a hotel's ability to innovate and achieve satisfied customers.
Calabrese *et al.* (2021)	SOSI	Fast-growing fitness equipment industry	The various combinations of sustainability strategies and service innovation lead to differences in companies' contribution to the SDGs.
Pougnet *et al.* (2022)	SOSI	Service	The willingness to adopt technology increases when potential long-term sustainability benefits are combined with new business interactions and new delivery systems.
Compared to literature using SOSI concept in the service sector, the current research shows the synergy effect of innovation and sustainability on consumer satisfaction in the retail sector.			

3. Development of hypotheses

3.1. Relationship between SOCI and satisfaction

Although the study of satisfaction in the context of the retail sector is widespread, the analysis of its relationship with variables as relevant today as innovation and sustainability remains scarce (Fuentes-Blasco *et al.*, 2017). Ta and Yang (2018) state the importance of companies developing innovative practices to differentiate themselves from their competitors to generate higher levels of satisfaction amongst their consumers and, therefore, retain them. Similarly, Fuentes-Blasco *et al.* (2017) analyse the relationship between technological innovation and marketing innovation with satisfaction in the services sector, observing that both types of innovation contribute to improving the image that consumers perceive of retail establishments and to increasing their satisfaction.

On the other hand, the literature has found support for the relationship between sustainability and satisfaction in several service contexts. In this way, Iniesta-Bonillo *et al.* (2016) observe a positive relationship between the sustainability perceived by visitors with respect to a tourist destination and their satisfaction with the trip. In a similar vein, Cottrell and Vaske (2006) confirm that the dimensions of sustainability (economic, social, and environmental) have a positive and significant effect on tourist satisfaction.

In the retail field, Marín-García *et al.* (2020) analyse the indirect effect of sustainability on consumer satisfaction, through the image and reputation of the store. The authors define sustainability based on the three dimensions postulated by Elkington (2004) and conclude the important role of sustainability in retail from the consumer's perspective and its effect on satisfaction.

Supported by those studies that corroborate the positive effect of innovation and sustainability in retail on consumer satisfaction, we posit that:

H1: Sustainability-oriented commerce innovation (SOCI) has a positive impact on consumer satisfaction with the retail establishment.

3.2. Mediating effect of store equity

Farquhar (1989) defines brand equity as "the added value with which a brand endows a product" (p. 24). Subsequently, this concept has evolved beyond the dimension of "product", referring to elements such as the "store" (Arnett *et al.*, 2003). Store equity is postulated as a decisive element in the commercial strategy of retail establishments, as a key to explaining the influence that sustainable and innovation practices have on the consumers' attitude towards the store. The development of sustainable practices by companies from an economic, social, and environmental perspective are important factors in attracting consumers to businesses (Lüdeke-Freund *et al.*, 2017). In this vein, corporate social responsibility (CSR) initiatives, which include sustainable practices, can lead to a better brand image for customers, employees, and other stakeholders, and may ultimately improve customer satisfaction. In this sense, previous research has concluded that variables traditionally linked to brand equity, such as image, exert a mediating effect on the relationship between CSR and customer satisfaction in service companies, as in the case of the hotel industry (Bashir and Amir, 2019). Moreover, the literature has indicated that carrying out initiatives linked to sustainability in retail helps to improve the consumer's perception of brand equity (Huang *et al.*, 2016). On the other hand, the innovative practices developed by the retail sector can contribute to generating store brand equity (Moliner-Velázquez *et al.*, 2019), especially in the context of green innovation (Huang *et al.*, 2016).

Research shows empirical evidence of the existence of close links between brand equity and satisfaction (Huang *et al.*, 2016; Yoo and Park, 2016; Marín-García *et al.*, 2020). The positive perceptions and the feelings generated by these brands and their products are fundamental and are strongly linked to consumer satisfaction.

Considering all of the above, we assume the joint action of innovation and sustainability (SOCI) on the brand equity of a retail establishment, which, in turn, is expected to influence positively customer satisfaction.

H2a: Sustainability-oriented commerce innovation (SOCI) has a positive impact on store equity.

H2b: Store equity has a positive impact on customer satisfaction.

H2c: The effect of SOCI on customer satisfaction is positively mediated by store equity.

3.3. Moderating effect of value co-creation

In recent years, the role played by the consumer in organisations has changed drastically, going from being a passive recipient of goods and services to becoming an active party in a company's performance (McColl-Kennedy *et al.*, 2017). In addition, recent literature is oriented to the study of value co-creation, focusing on three prominent themes: value co-creation in the context of customer service, value co-creation in the context of improving brand equity, and value co-creation for service marketing through the adoption of service logic (Saha *et al.*, 2020).

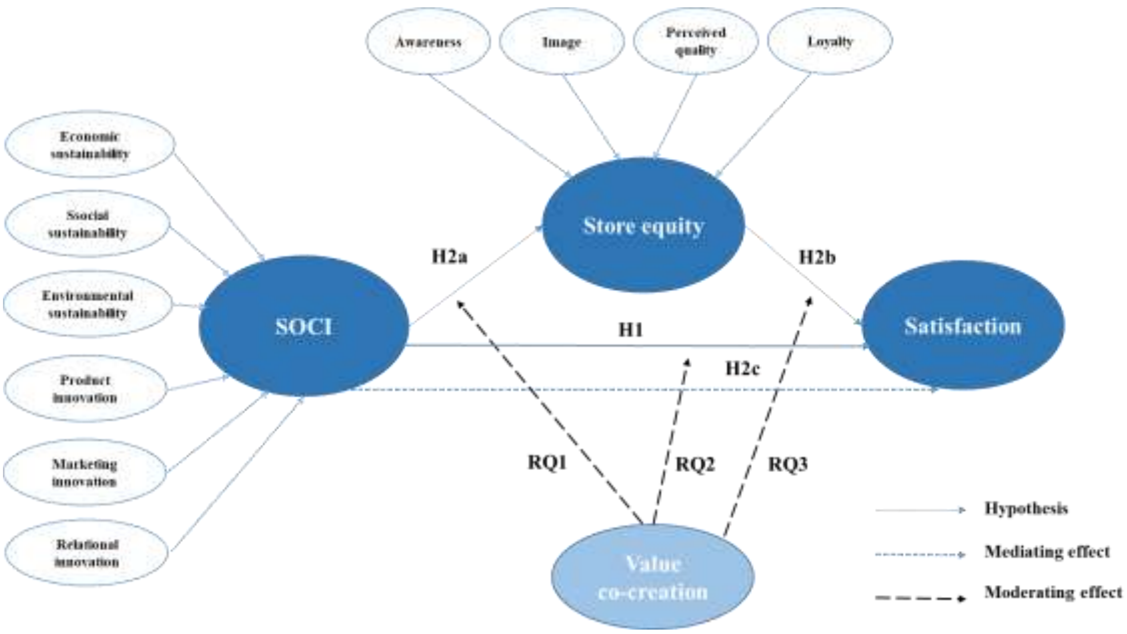
Recently, several studies have underlined the importance of involving the consumer in the design of activities that improve their experience (Anshu *et al.*, 2022). It is argued that consumer collaboration in the development of products or services leads to increased satisfaction and consequently improved perception of the organisation's brand (Slack *et al.*, 2020). In this sense, it is suggested that involving customers at certain times to create environments that improve their online shopping experience can be a good strategy for food retailers to improve customer purchase attitudes and intentions.

In addition, with an awareness of the change in the mentality of consumers towards issues related to sustainability, some studies point to the need for consumer participation in a company's decision-making process (Bassano *et al.*, 2018). The involvement of clients in the development of innovative and sustainable initiatives can contribute to improving consumer perception of these organisations. Considering the importance of value co-creation for firm performance, and observing that the literature shows scarce and inconclusive results in this regard, we pose the following research questions (RQ):

RQ1-3: Does consumer participation in the development of sustainable and innovative initiatives influence the relationships between sustainability-oriented commerce innovation (SOCI) and (RQ1) store equity, (RQ2) satisfaction, and between (RQ3) store equity and satisfaction?

Figure 1 presents the causal model.

Figure 1. Theoretical model and hypothesis



4. Methodology

To achieve the proposed objective, we conducted a survey and collected 510 valid questionnaires of consumers. Data collection was carried out through face-to-face interviews following a non-probabilistic quota sampling procedure, using the intercept technique. The establishments were selected based on their range of products and their positioning in the Spanish grocery retailing market. The commercial formats selected are hypermarket, supermarket, and discount store. The retail industry plays a key role in an economy eminently focused on services such as Spain, with a greater weight compared to other European economies in terms of activity, employment and number of companies. In addition, retail stores have a widely extended presence throughout the Spanish geography. From all this, the cohesive role of retailing both from the social and territorial perspective is inferred, which justifies the selection of this sector for the present research.

The scales used to measure the variables under study have been adapted from work carried out in the field of marketing. All of them have proven content validity. For store equity, the scale of Yoo *et al.* (2000) is adapted, and satisfaction was measured using the scale proposed by Bloemer and Oderkerken-Schröder (2002). Value co-creation was measured by adapting the scales developed by Ordanini and Parasuraman (2011) and Ruiz-Moreno *et al.* (2014), with five items, i.e. the store considers customer feedback: (1) in the process of developing new products and services, (2) in product and service improvements, (3) in the development of new products and services, (4) in improving store layout; and (5) the customer has an important role to play in improving and managing the relationship with the store.

Regarding the SOCI scale, a process was carried out that faithfully followed the eight methodological phases that the literature recommends in any process of development and validation of scales in marketing (Cantó *et al.*, 2021). After defining the domain of the construct by carrying out the conceptual delimitation of sustainability-oriented commerce innovation, in the second stage we proceeded to generate a list of items that were obtained from the literature review. To this end, we include, on the one hand, the three dimensions of sustainability included in the triple bottom line model and, on the other, the three dimensions of innovation identified from the consumer's perspective, thereby forming a scale in six dimensions: 1) economic sustainability; 2) social sustainability; 3) environmental sustainability; 4) product innovation; 5) marketing innovation; and, 6) relational innovation, to define a set of ad hoc indicators for the retail context, based on the sustainability evaluation scales of Lavorata (2014) and the innovation evaluation scales of Lin (2015). It was decided to measure all items using a seven-point Likert scale, as for the items of the rest of variables. The expert review was carried out in the fourth stage, in which the items that made up the measurement instrument were examined and validated by academics and professionals from the sector with extensive experience in issues related to retailing, sustainability, and innovation. Subsequently, the measurement instrument was tested in order to detect any deficiencies, noting full comprehension of all the indicators that made up the measurement instrument, a total of 26 items. Even so, the data collection phase and subsequent validation of the measurement instrument were still undertaken.

Next, the analysis of the data obtained is detailed, which was carried out in two phases. First, the measurement instrument was validated and, secondly, the structural model was estimated. In both cases partial least squares (PLS) regression was used. This is a technique widely used in recent years by researchers in the field of marketing (Henseler *et al.*, 2016).

5. Results

5.1. Measurement instrument validation

First, in order to identify the factor structure of the SOCI scale, a principal component analysis with varimax rotation was carried out. As a result, six well-differentiated factors emerged, three of them related to innovation in retail companies (product innovation, marketing innovation, and relational innovation), and three others linked to sustainability (social sustainability, economic sustainability, and environmental sustainability). These six factors together explain 76.26% of the total variance. Likewise, using the same dimension reduction technique, information was obtained about the factorial design of store equity. The results obtained indicate the existence of four factors, namely: awareness, image, perceived quality, and loyalty to the establishment. The four factors indicated account for 71.86% of the total variance. Second, using the partial least squares structural equation modeling (PLS-SEM) technique and calculating a PLS algorithm with a parameter of 300 maximum interactions and a path weighting scheme, we obtained information on factor loadings, reliability indexes and the average variance extracted (AVE), displayed in Table 2. In addition, following the criteria of Hair *et al.* (2011) to guarantee high-quality indices of the measurement instrument used in this research, we decided to eliminate the item loadings lower than 0.6 as suggested by Bagozzi and Yi (1988). Thus, we eliminated four indicators, one linked to economic sustainability

("STORE X pays producers a fair price"), another linked to social sustainability ("STORE X sells fair trade products"), another item related to environmental sustainability ("STORE X pays attention to the environment") and, finally, an item related to marketing innovation ("STORE X offers many innovative self-services").

Table 2. Reliability and convergent validity of the measuring instrument

Factor	Item	Loading	t	Cronbach α	CR	AVE
SOCI						
Economic sustainability	SOCI1. … pays its employees a decent wage.	0.905***	86.323	0.873	0.922	0.797
	SOCI2. … pays its employees a minimum wage in developing countries.	0.873***	54.241			
	SOCI3. … monitors the working conditions of its employees.	0.900***	77.099			
Social sustainability	SOCI4. … sells organic products.	0.853***	65.800	0.898	0.928	0.763
	SOCI5. … implements humanitarian actions.	0.859***	43.457			
	SOCI6. … engages in actions directed at social communities.	0.885***	55.322			
	SOCI7. … sells share products (donations to charitable associations).	0.895***	80.524			
Environmental sustainability	SOCI8. … recycles its products and packaging.	0.812***	29.650	0.817	0.888	0.725
	SOCI9. … cuts back its consumer of electricity.	0.866***	42.608			
Product innovation	SOCI10. … many new products.	0.828***	37.754	0.860	0.899	0.641
	SOCI11. … creative own designed products.	0.751***	28.288			
	SOCI12 … innovative private brand products.	0.823***	37.248			
	SOCI13. … more innovative products than other stores.	0.793***	32.292			
	SOCI14. … various products for selection.	0.805***	32.598			
Marketing innovation	SOCI15. …… services than other stores.	0.747***	28.871	0.886	0.916	0.687
	SOCI16. … atmosphere through store decoration	0.862***	66.297			
	SOCI17. … different in-store atmosphere.	0.845***	49.469			
	SOCI18. … innovative shopping environment.	0.872***	73.684			
	SOCI19. …is innovator.	0.813***	39.614			
Relational innovation	SOCI20. … different promotional programs.	0.841***	46.549	0.866	0.919	0.790
	SOCI21. … innovative promotion mix.	0.913***	91.734			
	SOCI22. … creative promotions than other stores.	0.911***	102.183			
Awareness	AW1. I am aware of…	0.779***	37.294	0.850	0.899	0.690
	AW2. … among other competing stores.	0.839***	54.839			
	AW3. … come to mind quickly.	0.880***	61.555			
	AW4. … in my mind.	0.821***	40.233			
Image	IM1. … friendly personnel	0.740***	31.971	0.865	0.902	0.649
	IM2. … extensive assortment.	0.811***	49.189			
	IM6. … attractive promotions in the store.	0.836***	57.766			
	IM7. … excellent customer service.	0.806***	42.890			
	IM8. … attractive loyalty program.	0.831***	62.139			
Perceived quality	QP1. … is extremely high.	0.864***	58.266	0.894	0.926	0.760
	QP2. … excellent service to its customers.	0.933***	121.003			
	QP3. … excellent service.	0.911***	95.928			
	QP4. … service right the first time.	0.769***	25.612			
Loyalty	LO1. I consider myself to be loyal…	0.923***	118.545	0.929	0.949	0.823
	LO2. … are my first choice.	0.909***	93.388			
	LO3. … if I can buy the same item at X stores,	0.919***	123.870			
	LO4. Even when items are available …	0.879***	62.936			
Satisfaction	SF1. … confirms my expectations.	0.875***	73.343	0.942	0.956	0.813
	SF2. I am satisfied with price/quality ratio…	0.918***	94.242			
	SF3. I am really satisfied with…	0.921***	113.885			
	SF4. In general, I am satisfied with…	0.924***	123.922			
	SF5. In general, I am satisfied with the products I get from…	0.869***	78.071			

CR= Composite Reliability, AVE= Average Variance Extracted
*** Statistically significant a, $p<0.01$

The results obtained from Cronbach's α are satisfactory, widely exceeding 0.7, the minimum required (Nunnally and Bernstein, 1994), and ranging between values of 0.8 and 0.9, recommended values for more advanced stages of the research (Nunnally and

Bernstein, 1994). The composite reliability analysis yields satisfactory results, which far exceed 0.7 (Chin, 1998), and all the constructs of the structural model obtain AVE greater than 0.5 (Fornell and Larcker, 1981), thus confirming the reliability and convergent validity of the measurement instrument. Next, we analyse the discriminant validity through the criterion proposed by Fornell and Larcker (1981) and the heterotrait-monotrait (HTMT) ratio of correlations.

Table 3. Discriminant validity (Fornell–Larcker criterion and HTMT)

	1	2	3	4	5	6	7	8	9	10	11
1. Economic sustainability	**0.893**	0.502	0.575	0.283	0.454	0.204	0.463	0.390	0.628	0.515	0.483
2. Social sustainability	0.453	**0.874**	0.689	0.315	0.388	0.266	0.307	0.338	0.442	0.487	0.535
3. Environmental sustainability	0.483	0.611	**0.852**	0.291	0.358	0.317	0.262	0.424	0.543	0.487	0.422
4. Product innovation	0.251	0.291	0.253	**0.800**	0.669	0.494	0.374	0.584	0.437	0.296	0.400
5. Marketing innovation	0.406	0.362	0.326	0.589	**0.829**	0.643	0.530	0.624	0.493	0.246	0.569
6. Relational innovation	0.172	0.249	0.279	0.432	0.573	**0.889**	0.373	0.741	0.527	0.373	0.467
7. Awareness	0.403	0.279	0.403	0.335	0.470	0.423	**0.831**	0.684	0.573	0.396	0.704
8. Image	0.336	0.315	0.336	0.512	0.556	0.659	0.596	**0.805**	0.736	0.524	0.628
9. Perceived quality	0.560	0.417	0.560	0.392	0.462	0.465	0.506	0.642	**0.872**	0.781	0.621
10. Loyalty	0.466	0.455	0.466	0.281	0.222	0.342	0.356	0.488	0.711	**0.907**	0.515
11. Satisfaction	0.441	0.503	0.441	0.366	0.528	0.424	0.644	0.578	0.587	0.489	**0.902**

Notes: Diagonal values in italic are square roots of AVE and values below the diagonal are correlations between variables. Values above the diagonal are heterotrait-monotrait (HTMT) ratios.

As can be seen in Table 3, the square root of the AVE that appears on the diagonal of the matrix is higher than the estimated correlation between the factors, which appears below the diagonal, in all cases, corroborating the discriminant validity. In addition, the discriminant validity is ratified through the cross loadings (Chin, 1998), showing that the loadings of each indicator with its corresponding latent variable are greater than the rest of the cross loadings with other dependent variables. Finally, the value of the HTMT ratio is less than 0.9 in all cases (Henseler *et al.,* 2015), thereby confirming the discriminant validity of the measurement model.

Considering both SOCI and store equity as second-order constructs, made up of formative elements, we now analyse their weightings. Following the criteria of Diamantopoulos and Winklhofer (2001), it is possible to confirm the absence of collinearity, since the variance inflation factor (VIF) for the dimensions of the second-order constructs is less than the critical level of 5 (Table 4).

Table 4. Parameter estimates of the formative second-order constructs

1st Level Factor	2nd Level Factor	Weights	VIF	*p-value*
SOCI	Economic sustainability	0.247	1.509	0.000
	Social sustainability	0.236	1.738	0.000
	Environmental sustainability	0.216	1.788	0.000
	Product innovation	0.212	1.579	0.000
	Marketing innovation	0.266	2.144	0.000
	Relational innovation	0.256	1.568	0.000
Store equity	Awareness	0.305	1.618	0.000
	Image	0.325	2.056	0.000
	Perceived quality	0.328	2.720	0.000
	Loyalty	0.265	2.030	0.000

After assessing the measurement instrument used for the empirical evaluation of each of the constructs that explains the proposed theoretical model and confirming its reliability and validity through the results obtained, the structural model is estimated.

5.2. Estimation of the structural model

For the analysis of the proposed structural model, a complete bootstrapping was carried out with 5000 subsamples (Ringle, 2015) in order to evaluate the causal relationships that make up the model hypotheses and their significance. Table 5 shows the results of the estimation of the structural model of this research.

Table 5. Causal relationships estimation

Causal relationship		Total sample		
		Hypothesis	**Standardised beta**	***t***
H1	SOCI → Satisfaction	Supported	0.257***	5.009
H2a	SOCI → Store equity	Supported	0.733***	38.602
H2b	Store equity → Satisfaction	Supported	0.518***	10.414

Store equity: R^2= 0.537, Q^2=0.337; Satisfaction: R^2=0.528, Q^2=0.400
*** Statistically significant at $p<0.01$

From the data shown in Table 5, we can see that all the constructs dependent on the structural model show R^2 values above 0.1, the minimum threshold established by Falk and Miller (1992). In addition, all the values obtained from the Q^2 statistic are greater than 0, which allows us to confirm that the model has predictive validity. We can affirm from the analysis of these two indicators, explained variance and predictive relevance, that the model has adequate predictive validity, which allows us to continue examining the significance of the defined structural relationships. Table 5 presents the results obtained, which have allowed us to contrast and accept the hypotheses proposed. Thus, the results obtained are aligned with those studies concluding that sustainable and innovative practices implemented by organisations can contribute to generating satisfaction (Fuentes-Blasco *et al.*, 2017) and brand equity (Huang *et al.*, 2016).

5.3. Analysis of the mediating effect of store equity

The analysis of the role of store equity as a mediating variable between SOCI and satisfaction was carried out using the Preacher and Hayes bootstrapping technique (2008). As a result of this analysis, a significant direct ($\beta = 0.138$; $p < 0.01$) and indirect effect ($\beta = 0.380$; $p < 0.01$) between SOCI and consumer satisfaction is inferred. In this way, hypothesis H2c is confirmed, which proposes the mediating effect of store equity on the SOCI–satisfaction relationship. Additionally, this link can be corroborated through the variance accounted for (VAF) result, which allows assessment of the magnitude of the indirect effect in relation to the total effect (Nitzl *et al.*, 2016), and that store equity has a partial mediating effect on this relationship (0.596). These results are consistent with Huang *et al.* (2016), who point out the mediating role of brand image – a dimension of brand equity – on the relation between sustainable innovation and customer satisfaction in the context of retailing.

5.4 Analysis of the moderating effect of value co-creation

Moving forward in the analysis of the links suggested in this work, the PLS-SEM multigroup analysis (PLS-MGA) is used to perform a multigroup analysis to respond to the RQ1-3 group. First of all, the RQs related to the group of consumers that present a low level of value co-creation are analysed; that is, they are reluctant to collaborate with the establishments when transmitting their opinions and ideas for the design of new marketing strategies. For this consumer segment, the results obtained do seem to indicate that SOSI could positively influence both satisfaction and store equity. In addition, the data also show the existence of a positive and significant effect between store equity and satisfaction. However, for the group of consumers that present higher levels of collaboration with establishments, RQ3 seems to show that it would not have an effect. That is, the development of innovative and sustainable practices would not have an effect for the group of consumers with a high level of participation. Finally, the results shown in Table 6 confirm that the level of consumer participation only moderates the relationship between store equity and satisfaction. In this way, we can respond to RQ1-3 by confirming that there is a positive moderation of the co-creation of value when analysing its effect on the variables of store equity and satisfaction. This finding is consistent with a strong association between consumers' collaboration in the development of products or services and their enhanced satisfaction and perception of firm brand pointed out by Slack *et al.* (2020). Therefore, these analyses allow us to respond to those studies in the area of retail and call for further research on the level of collaboration between consumers and stores (Pantano *et al.,* 2018).

Table 6. Results of the multigroup analysis

Research Questions	**Causal relationship**	**Low value co-creation *N= 289***		**High value co-creation *N= 221***		***p-value***
		Standardised parameter	*t*	Standardised parameter	*t*	
RQ1	SOCI → Store equity	0.694***	23.480	0.711***	30.917	0.352ns
RQ2	SOCI → Satisfaction	0.364***	17.179	0.012ns	13.964	0.376ns
RQ3	Store equity → Satisfaction	0.382***	5.987	0.758***	11.917	0.000***

*** Statistically significant at p<0.01; ns: non-statistically significant

6. Conclusions

6.1. Theoretical contributions

This work has enabled an advance in knowledge of the joint effect exerted by innovation and sustainability in retail distribution. In addition, it has contributed to shedding light on the role played by value co-creation in the effects that are triggered. Consequently, the results obtained allow us to formulate a set of theoretical conclusions and practical implications that are presented below.

Firstly, the development of this work is based on the idea that retail is in a moment of great change (Elg *et al.,* 2021; Johansson, 2022), where innovation (Pantano and Vannucci, 2019) and sustainability (Vadakkepatt *et al*., 2021) must play a key role. In relation to sustainability, these changes have been taking place as consumers are looking for products that cause minimal environmental risk and that also provide a positive social benefit. In this sense, the power granted to the retail sector, thanks to its privileged position in the distribution channels, implies a strong influence both on the ascending agents in the distribution channel and on the descending members of it, i.e., their customers (Vadakkepatt *et al*., 2021). On the other hand, innovation is a factor that has radically modified the business models of retail companies, their business opportunities and consumer purchasing processes (Pantano and Vannucci, 2019). For all these reasons, our study continues with this line of thought that aims to expand knowledge about the effects of both sustainability and innovation in retail (Bilińska-Reformat *et al*., 2019).

Secondly, the literature in retail has already shown that either innovation or sustainability or both, as independent variables, are factors that generate competitive advantages for retail businesses (Fuentes-Blasco *et al.*, 2017; Marín-García *et al.*, 2020, Table 1). However, based on the idea that the whole is greater than the sum (Stoyanov, 2022) and taking the synergy between innovation and sustainability into account, our current study goes further. We point out that it is possible to define a unique construct, sustainability-oriented commerce innovation (SOCI), combining innovation and sustainability in a multidimensional concept and which simultaneously influences consumer satisfaction with commercial settings. Additionally, we point out that not only does SOCI have a direct effect on consumer satisfaction, but it is partially mediated by store equity. These results help to better understand the synergy between both variables, innovation and sustainability, compared to the previous literature in the retail field that examined innovation (e.g., Sorescu, 2011; Hristov and Reynolds, 2015; Pantano and Vannucci, 2019) and sustainability (e.g., Wiese *et al.*, 2012; Vadakkepatt *et al.*, 2021) separately.

Thirdly, this current research takes the recently coined concept of SOSI (Calabrese *et al.*, 2018a; 2018b; 2021) as a point of departure to adapt it in the context of retailing and proposes an ad hoc measure scale of sustainability-oriented commerce innovation (SOCI) that is specific to the field of retail commercial distribution. The corresponding measure of a higher order includes six basic components: economic sustainability, social sustainability, environmental sustainability, product innovation, marketing innovation, and relational innovation. These six dimensions are part of a whole greater than the sum of its parts. In addition, the design of the scale followed the methodological procedure that guides the design of measurement instruments in marketing and as the data obtained in regard to the quality of the scale are satisfactory, this novel approach is recommended as a valid tool to guide decision-making in this sector.

Moreover, this work presents an additional original contribution by including in the same model the moderating character of value co-creation which is scarcely explored in retail. Indeed, while previous research provides evidence on the level at which consumers are involved in the development of the service (Pantano *et al.*, 2018), our results show that the effect of store equity on consumer satisfaction is stronger when the client presents a high level of value co-creation than when the client experiences a low level of it. This finding clarifies how the consumer participation in the development of sustainable and innovative initiatives can enhance the role of store equity in building consumer satisfaction towards the retail establishment.

6.2. Managerial implications

By carrying out this work and with the results achieved, we were able to formulate a series of recommendations for store managers, especially those working for establishments that sell food products.

First of all, the development of the concept of SOCI and its corresponding measurement instrument can be useful to guide decision-making at points of sale. This scale can be used as a management tool to ascertain the beliefs, perceptions, and attitudes of consumers regarding how innovative the businesses are (in service, in marketing, or in their own relationships) when oriented towards sustainable economic, social, and environmental practices. Moreover, SOCI can be an instrument that helps improve the image of organisations, since this tool enables analysis of their contribution to the UN Sustainable Development Goals. Likewise, this tool responds to the existing demand in the retail sector for instruments that allow measurement of the success of sustainability efforts and which go beyond traditional metrics based on sales in retailing. The SOCI scale makes it possible to focus the attention of senior management on aspects such as recycling, waste reduction or the impact of the development of new products on the perception of consumers.

Secondly, closely linked to what was mentioned above, we can state that it is vital for companies to carry out their business activities from the dual perspective of innovation and sustainability. The development of new products with recycled material, the reduction of the resources used in the manufacturing process, the launch of new proposals linked to fair trade, or collaborations with associations that offer support for disadvantaged social groups, as well as their participation in social events and sports, are all actions that can help to strengthen positive feelings of the consumer towards the store and increase their satisfaction. In relation to the store environment, aesthetic changes, such as lighting, can help to create a more pleasant ambience. For example, the combination of white lights, lamps, and natural light would favour what is known as "clean lighting". In addition, launching promotional actions that increase the consumers' level of awareness of establishments and their products by encouraging participation in prize draws or contests on social media, or through product tastings, renewing or highlighting distinctive identifiers, such as their logo, or improving the quality of service offered by employees, are also actions that can positively boost customer satisfaction. The consumer will thus have a better perception of the establishments if the employees attend them in a more personalised and friendly manner. In summary, in light of the findings of this work and, considering what the literature states in relation to innovation and sustainability (e.g., Wikhamn, 2019), we find support for the role of innovative sustainable practices as a driver of customer satisfaction.

Finally, it is considered necessary on certain occasions to have the participation of the consumer in order to improve their perception of the brand and thus generate co-creation of value in retailing (Bassano *et al.*, 2018). In this sense, meeting with different groups of consumers, creating forums or group dynamics where they can take part and propose new ideas, can improve the perception that consumers have of establishments, generating more positive feelings towards the store and consequently improving customer satisfaction. In short, it is about motivating the behavioural change of the agents related to the establishments, in this case, their clients, through their participation in the operational and strategic decisions of retail stores. In this case, the collaboration of consumers becomes even more relevant due to changes in social norms and attitudes of consumers, who consider it essential for companies to integrate sustainability into their central strategy (Vadakkepatt *et al.*, 2021).

6.3. Limitations and future lines of research

Finally, some limitations of this work are presented that can lead to opportunities for future research in marketing. Firstly, regarding the geographical area in which this study is carried out, its focus is a single region. We therefore believe that it would be appropriate to replicate the analyses in other geographical areas in order to examine whether these results may be affected by the influence of different cultures. Secondly, in relation to the SOCI scale, we consider that, in order to have an accurate measure of its usefulness, it needs to be used in other research in contexts similar to ours. In this way, the validation of the scale by additional studies can improve the quality of the measurement instrument. On the other hand, continuing with SOCI, we understand that its scope is greater than that indicated in this study. For this reason, we propose the analysis of this variable by assessing its consequences, but also its antecedents. To do this, the effect that this variable may have on constructs such as trust towards the establishment could be examined. Similarly, we believe that the concept of value co-creation in the retail sector has a lengthy history. Therefore, in addition to examining the moderating effect of this variable as in the study presented, it is also proposed that the antecedent and consequent variables of this could be examined. These analyses can provide more information about its nature and scope.

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