



The customer retail app experience: Implications for customer loyalty

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ABSTRACT

Retailer mobile applications are one of the principal retail purchase and information search channels. Customer experience is key to retail app success. However, its dimensions and impact on retailer performance have been the subject of only a limited number of studies. This research builds on existing customer retail app experience literature by considering four dimensions as precursors of satisfaction with the retailers' app and customer loyalty (cognitive, affective, relational and sensorial). Data were collected from a sample of 545 retailer app users and analysed using PLS-SEM. The results demonstrate that the affective dimension has the most influence and they highlight the importance of the sensory experience, which even surpasses the cognitive experience. The effect of the relational dimension on customer satisfaction, meanwhile, could not be positively confirmed. Analysis of the moderating effect of gender, age and device type used identifies effects that have not, until now, been demonstrated in current literature.

1. Introduction

The customer experience (CX) with retail channels is moving towards the integration of the physical and digital worlds (Gao et al., 2021). Retailers' mobile applications (hereinafter, retailers' apps) play a significant role in this integration due to their market penetration and their importance in mobile shopping. Apps allow users to communicate with retailers in an easy, fast and convenient way, both to access information and to carry out transactions (van Noort and van Reijmersdal, 2019). Moreover, apps can lead users make more frequent purchases and spend more on purchases compared with non-app users (Liu et al., 2019).

Even though an increasing percentage of customers make purchases through retailers' apps, most users download and use only a few, mainly those belonging to large companies (Internet Retailer, 2018). In addition, users habitually uninstall the app after they have accessed the information or the promotion, or have completed the purchase (Synchrony, 2018). Therefore, the effect of apps on retailers' relationships with their customers is questioned. Until now, research into the use of retailers' apps has focused mainly on why customers download them, the intention to use the app, the frequency of use and the purchase intention; while few studies have analysed customer post-adoption behaviours (McLean et al., 2020; Ratchford, 2020).

Several recent studies suggest the need to examine empirical knowledge of the impact of firm-controlled touchpoint customer experiences (e.g., retail apps) on consumer post-purchase behaviour (e.g., Becker and Jaakkola, 2020) in closer detail. The customer retail app experience differs from other touchpoint experiences. Apps allow customers to obtain data about products in easy and intuitive ways, and to compare, buy, comment, rate, and to share information (Grewal et al., 2017). Users can access promotions, discounts and personalised services (Parise et al., 2016). The services can be integrated and complemented with those offered within physical stores (Inman and Nikolova, 2017).

Retail apps, therefore, have the potential to play a key role in influencing customer-retailer relationships. However, hitherto a small number of studies have analysed the impact of CX with the retailer mobile app on customer loyalty (CL) (i.e., loyalty felt by the customer towards the retailer). In this regard, Molinillo et al. (2020a) and Japutra et al. (2021) contended that CX affects CL. Although prior studies enhanced our understanding of customer retail app experiences and consumer post-adoption behaviour, they are limited since they focus mainly on specific customer experience dimensions and do not consider the overall effect of four CX dimensions that were recently identified as the most relevant to the technological impact in online CX literature. These dimensions are cognitive, affective, sensorial and relational (Bleier et al., 2019; Hoyer et al., 2020).

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In addition, some studies have pointed out that the experience in online environments is affected by consumers' demographic characteristics (Lee and Kim, 2019) and by the type of device used (Barta et al., 2021). In this respect, research has highlighted the impact of factors such as gender (Pandey and Chawla, 2018), age (San-Martín et al., 2015) and mobile device screen size (McLean et al., 2018). However, the moderating effect of these factors on the customer retail app experience has not hitherto been studied.

This study aims to respond to this gap by assessing the impact of the customer retail app experience on CL. To reach this goal, four research questions are posed: (RQ1) How do the four dimensions of CX (i.e., cognitive, affective, relational and sensorial) influence the customer's satisfaction with an app? (RQ2) How does satisfaction contribute to CL? (RQ3) Does satisfaction mediate the relationship between CX with the app and CL to the retailer? (RQ4) How do age, gender and the type of device used moderate relationships between CX, satisfaction with the app and CL?

This research offers both theoretical and practical contributions by expanding current knowledge about CX dimensions and retail apps, and the impact of these dimensions on CL for retailers. Therefore, we believe it will be of interest to researchers and retail managers.

2. Theoretical background

2.1. Customer loyalty

Customer loyalty can be understood as favourable behaviour towards a company, evidenced through a customer's likeliness to do repeat business with a given retailer, a preference towards a certain brand and word-of-mouth advocacy (Zeithaml et al., 1996). The proliferation of touchpoints in the omnichannel business strategies on which consumers interact with retailers has had an impact on the complexity of the purchase-making process (Flavián et al., 2021) and on retailer customer loyalty (Gao et al., 2021).

Herhausen et al. (2019) noted that to successfully manage these complex customer journeys, retailers need to understand the background to customer loyalty on the multiple online and offline channels that consumers use when interacting with the company.

Previous online consumer behaviour studies have identified a suite of factors that influence customer retailer loyalty. These include customization, interactivity, interface design, community, information, incentives, range of products, overall image (Srinivasan et al., 2002), satisfaction, reputation (Casaló et al., 2008; Gutiérrez Rodríguez et al., 2020), website quality (Roy et al., 2014), usefulness, ease of use (Purani et al., 2019) and perceived value (Molinillo et al., 2021), among others.

Mobile commerce literature highlights several factors that influence m-loyalty, such as convenience (Thakur, 2016), ease of use, usefulness, enjoyment (Kumar et al., 2018), personal relationship (Tseng and Lee, 2018) and customer satisfaction (Omar et al., 2021).

Some researchers have recently closely examined the impact of CX on offline and online retail customer loyalty (e.g., Bleier et al., 2019; Pandey and Chawla, 2018; Pekovic and Rolland, 2020), understanding that the consumer experience is holistic and includes consumer reactions to brand or company interactions beyond special channel characteristics (Lemon and Verhoef, 2016). However, we believe that, in an omnichannel environment, the objective should go beyond understanding how CX garners loyalty to a specific retail channel (e.g., offline shop, web, app, social media) and extend to the retailer as a company or brand.

In this respect, some mobile app research has demonstrated the positive impact on loyalty to a retailer as a company/brand of app-related factors, such as value-in-use (Fang, 2019), app engagement (McLean, 2018), attitude towards an app (McLean et al., 2020) and even the customer experience with the retail app (Molinillo et al., 2020b; Japutra et al., 2021). However, while these studies successfully demonstrate the positive impact of the customer retail app experience in

fostering customer loyalty to retailers, these research contributions could be broadened by through conceptualisation of CX including dimensions of the experience that permit more comprehensive collection of consumer reactions to specific retail apps.

2.2. Customer experience

Marketing literature usually presents CX as a holistic, multi-dimensional construct that represents customer reactions to company or brand interactions (e.g., Bleier et al., 2019; Brakus et al., 2009; Hoyer et al., 2020; Schmitt, 1999). While there is broad consensus among researchers regarding this side to CX involving several individual but connected dimensions, the dimensions specific to each measurement scale vary slightly among more prominent works (see Appendix). It could be said, therefore, that research on CX most commonly reiterates five dimensions: cognitive, affective, social, sensorial, and physical-behavioural (De Keyser et al., 2020; Hoffman and Novak, 2018; Schmitt and Zarantonello, 2013).

In the context of retail, some authors have also used, to a greater or lesser extent, these five dimensions to measure CX (e.g., Cachero-Martínez and Vázquez-Casielles, 2021; Lemon and Verhoef, 2016; Srivastava and Kaul, 2014). However, other studies employed a much more simplistic approach when examining online and omnichannel CX by only including the cognitive dimension (e.g., Novak et al., 2000), or combining the cognitive and affective dimensions (e.g., Gao et al., 2021; Martin et al., 2015; Rose et al., 2012; Tyrväinen et al., 2020) or including all dimensions expect for physical-behavioural (Bleier et al., 2019).

Although prior investigations have made important contributions to the comprehension of the online shopping experience, we consider that the results so far obtained cannot, due to the apps' particular characteristics and functionalities, be directly extrapolated to the framework of retail apps (Fuentes et al., 2017). In the field of retail apps, Molinillo et al. (2020a) conceptualised CX through two dimensions, the cognitive and affective, while Japutra et al. (2021) proposed a more multidimensional conceptualisation (i.e., affective, sensory, interactivity and relative advantage). In the same respect, Mondal and Chakrabarti (2021) used the five basic CX dimensions identified above to integrate twenty fundamental factors of app-based online environments. However, their model was based on expert opinions rather than customer-based empirical studies.

This study is based on four of the major faculties of the mind (reasoning, emotion, social relations and perception), tenets of cognitive psychology (Pinker, 1998), and examines CX with retail app conceptualisation based on four experiential dimensions: cognitive, affective, relational and sensorial. Cognitive experience is associated with rational elements, thought and mental absorption; affective experience is linked to moods, feelings and emotions; relational experience is connected to customer identification, their social context and their relationships with the company and other customers; and sensorial experience is linked to the senses and aesthetics.

As mentioned above, these dimensions are the most widely acknowledged by CX researchers, in conjunction with behavioural/pragmatic dimensions (De Keyser et al., 2020). This last dimension refers to how we interact with the environment through bodily actions (Schmitt et al., 2015) and is not included in this study because recent research suggests that customer perception in an online environment is not physical, like in an offline environment, but sensorial due to the interaction that takes place with the app interface and design cues (Bleier et al., 2019; Hoyer et al., 2020; Keiningham et al., 2017). This study therefore broadens the model presented by Molinillo et al. (2020a) by including relational and sensorial dimensions to examine how the customer retail app experience impacts customer retailer loyalty.

3. Research model

Our research model is supported by e-commerce literature about Web-, smart technology- and mobile app-related CX. The rationale for including these varied sources is that mobile apps are hyper connected to other platforms in today's e-commerce landscape and lessons can be learnt from understanding CX through other e-commerce platforms and how they can be extrapolated to the customer mobile app experience.

A positive CX leads to satisfaction (Klaus and Maklan, 2013; Lin and Bennett, 2014). Chang (2015) defined satisfaction with an app in terms of the customer's overall perception of the mobile app. For Trivedi and Trivedi (2018), based on Anderson and Srinivasan (2003), satisfaction with an app is a customer's degree of contentment with their shopping experiences using the app. In this study, app customer satisfaction is conceptualised as customer contentment with regards to his/her overall assessment of his/her experience when engaging with a specific retail app.

In online environments, positive retailer-customer interactions improve customers' evaluations and impressions of retailers, leading to satisfaction (Roy et al., 2017). Similarly, Mosquera et al. (2018) showed that when customers enjoy valuable experiences with smart technologies, they are more satisfied. On the same lines, Pandey and Chawla (2018) showed that the result of the customer's shopping experience determines their satisfaction with online retailers. Likewise, Thakur (2018) verifies this relationship in the context of mobile apps.

Several studies have confirmed that the cognitive dimension of experience positively influences satisfaction in online environments; that is, as the web allows users to search for information, and purchase, efficiently, they can fulfil their expectations (Barari et al., 2020; Rose et al., 2012). Thus, Martin et al. (2015) have shown that cognitive experience in the online commerce impacts satisfaction. Shin (2015) suggested that cognition is a key dimension for customer satisfaction with smartphones. Xu et al. (2015) confirmed that the cognitive dimension of experience positively affects app satisfaction; this has also been demonstrated in the specific area of retail apps (McLean et al., 2018; Molinillo et al., 2020a).

H1. The cognitive customer experience with a retail mobile app positively impacts satisfaction.

According to Martin et al. (2015) and Shin (2015), affective experience decisively affects satisfaction. Souiden et al. (2019) argued that, to understand customers' decision-making processes, it is imperative to take into account their emotional reactions both in physical stores and online. It has been demonstrated that in online environments, the affective experience greatly influences satisfaction (Barari et al., 2020). Similarly, Martin et al. (2015) stated that the affective experience of the customer leads to the development of repurchase intentions. This relationship has been specifically demonstrated in the fields of m-commerce and mobile apps. In this respect, Alnawas and Aburub (2016) found that hedonic benefits influence satisfaction with apps because customers have needs, such as aesthetics, fun, or escape from daily life, which, when fulfilled, make them feel pleasure and enjoyment. Similarly, Iyer et al. (2018) proved that the hedonic value customers derive from retail apps leads them to feel more satisfaction; and Molinillo et al. (2020a) showed that an affective app user experience generates a higher level of satisfaction.

H2. The customer affective experience with a retail mobile app positively impacts satisfaction.

Retail apps feature tools that allow users to interact with other users and with the brand (e.g., ratings, recommendations, sharing photos and videos). The relational dimension of experience takes into account the person, the social context, his/her relationships and ideal self (Gentile et al., 2007). Customers value social relations because these relations can improve their purchase decisions, increase their possibilities of interacting with other users, and of being seen as experts in their fields (Alnawas and Aburub, 2016). Fang

(2019) argued that brand-customer relationships facilitated by brand apps are value-in-use, that is, they enhance both the user's intention to continue using an application, and foster brand loyalty. Some studies have proposed that the relational, or social, dimension contributes significantly to explaining CX (Keiningham et al., 2017; Srivastava and Kaul, 2014). In the app field, it has been proven that brand-customer para-social interaction increases intention to purchase, use and recommend apps (Tseng and Lee, 2018).

H3. The customer relational experience with a retail mobile app positively impacts satisfaction.

Previous studies demonstrated that the sensorial dimension of experience strengthens consumer perceived value and fosters positive behaviours towards companies (Pino et al., 2020). The sensorial dimension of experience influences satisfaction and brand loyalty (Brakus et al., 2009). More recently, Iglesias et al. (2019) showed that a sensorial experience with a brand positively impacts satisfaction. In virtual environments, the impossibility of touching the products displayed obliges retailers to design visual stimuli that offer consumers better experiences with products (Overmars and Poels, 2015). Companies, to improve the CX, should transfer the atmosphere and sensations of the physical store (e.g., colours, sounds, smells) to online environments (Roggeveen et al., 2020). Xu et al. (2015) demonstrated the influence of app aesthetics on satisfaction.

H4. The customer sensorial experience with a retail mobile app positively impacts satisfaction.

Satisfaction is necessary to achieve CL. Brakus et al. (2009) showed that satisfaction positively impacts CL. Lin and Bennett (2014) found that customers who were satisfied with their experiences in offline stores showed greater repurchase and recommendation intention, and greater resistance to competitive promotions. These relationships have been confirmed by research performed in online shopping contexts (Pandey and Chawla, 2018; Rose et al., 2012). Moreover, several investigations validated the effect of satisfaction on CL in mobile contexts as mobile communication (Kim et al., 2017) and m-commerce (Lin and Wang, 2006). Alnawas and Aburub (2016) and Chang (2015) showed that user satisfaction is an important antecedent of the development of CL to an app. More specifically, it has been shown that when retail app users are satisfied with the services offered by an app, they are more likely to continue making these purchases, and recommend them (Iyer et al., 2018; Thakur, 2018; Trivedi and Trivedi, 2018). Additionally, Molinillo et al. (2020a) demonstrated that app satisfaction positively influences CL.

H5. Customer app satisfaction positively impacts customer retailer loyalty.

Some studies indicated that satisfaction mediates the link between CX and CL. Thus, Klaus and Maklan (2013) showed that CX in both offline and online environments has an mediated influence on CL, through satisfaction; Pandey and Chawla (2018) showed that customers' online experiences have direct and indirect impacts, through satisfaction, on CL to clothing e-retailers; similarly, Roy et al. (2017) showed an indirect effect of CX on stickiness to e-retailers, through satisfaction; Rose et al. (2012) found that the effect of affective and cognitive experiences on repurchase intention is mediated by satisfaction; finally, Molinillo et al. (2020a) confirmed that cognitive and affective experiences of retailer's apps have indirect effects on CL through satisfaction and trust in the app.

H6. Customer app satisfaction mediates the relationships between cognitive experience (H6a), affective experience (H6b), relational experience (H6c), sensorial experience (H6d) and customer loyalty.

Last of all, previous research suggests that the model's relationships could be moderated by customers' characteristics and by the devices used to access retailer apps. In this sense, Pandey and Chawla (2018) empirically proved in e-commerce environments that gender moderates

the effect of CX on CS. Likewise, [Lim et al. \(2021\)](#) point out that user gender impacts perception of branded apps, such that men focus their experience on the functions integrated into the app, while women attach greater value to the creation of a warm and attentive relationship with the retailer. [San-Martín et al. \(2015\)](#) observed that entertainment with the m-shopping experience is more important for younger users. For adults, meanwhile, the positive impact of subjective norms on satisfaction in mobile purchases is greater. [McLean et al. \(2018\)](#), showed that the size of a device's screen moderates the experience of using retailer apps. Specifically, users with a smaller screen size value ease-of-use, convenience and personalisation utilitarian factors more highly than users with a larger screen.

H7. Gender (H7a), age (H7b) and device type (H7c) moderate the effect of customer experience on satisfaction with the app and the impact of their satisfaction on loyalty towards the retailer.

The research framework, which includes the seven hypotheses, is shown in [Fig. 1](#).

4. Method

4.1. Data collection

Data were collected through a web-based survey. Three experts reviewed the questionnaire in advance and provided feedback which helped improve the flow. Thereafter, the measurement instrument was validated in a pre-test with a sample of university students. Once the validity and reliability of the scales had been confirmed, we collected the data to assess the research model using convenience sampling, from retail app users (October–November 2019). We used screening questions to control this feature. We disseminated the invitation to participate in the study on social networks and through a mailing list of consumers who had already agreed to participate in these types of research projects. Once participants accepted the invitation, they could complete the online questionnaire. Participation was voluntary and no incentives were offered to prevent any type of biases from arising from their use.

The sample included a total of 550 respondents, although 5 questionnaires were removed because of missing values (n = 545). The characteristics of the sample (see [Table 1](#)) correspond to the profile of habitual users of mobile applications in Spain ([Ditrendia, 2018](#)): 54.5% were women, 54.7% were under 25 years of age, 52.0% were university graduates, 51% were employees/self-employed, and 89% used smartphone applications. Each participant answered the research model questions regarding which retail app they use most frequently. The most popular apps were from retailers who specialised in apparel/footwear, sporting goods, cultural and electronic products, home accessories and furniture, and hypermarkets.

4.2. Measures

Likert-type scales validated in previous research were used to measure the model's variables. Cognitive dimension was measured through three items adopted from [Novak et al. \(2000\)](#) and [Molinillo et al. \(2020a\)](#); affective dimension by eight semantic differential items from [Rose et al. \(2012\)](#); relational and sensorial experiences by two and seven items, respectively, from [Gentile et al. \(2007\)](#). Customer satisfaction was measured through three items adopted from [Lin and Wang \(2006\)](#), and customer loyalty using five items from [Zeithaml et al. \(1996\)](#). The wording of the scale items was adapted, where necessary.

4.3. Analysis of the data

This study tested the proposed model using partial least squares path modelling (PLS-SEM) through SmartPLS 3.0 software ([Ringle et al., 2015](#)). This technique is less restrictive than SEM and is appropriate with small samples and where it has not been possible to verify data normality ([Hair et al., 2016](#)). In this case, considering the results of the Kolmogorov-Smirnov normality test with SPSS, it was not possible to guarantee that the data were normally distributed (all p-values <0.05). It has also, recently, been suggested that PLS-SEM performs better than covariance-based regression analysis for the evaluation of mediation ([Hair et al., 2019](#)).

Data analysis was conducted following a two-stage approach. First, the reliability and validity for the measurement model was analysed. Second, the hypothesized model was estimated. To guarantee the

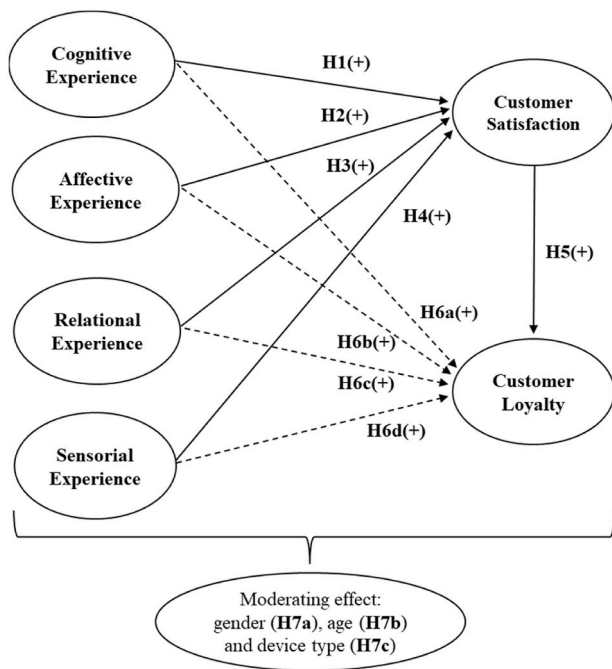


Fig. 1. Research framework.

Note: Continuous lines indicate the direct relationships of the research model. Dotted lines represent the indirect effects of the CX dimensions on customer loyalty.

Table 1
Sociodemographic characteristics.

Factor	N	%
<i>Gender</i>		
Male	248	45.5
Female	297	54.5
<i>Age (years)</i>		
<18	78	14.3
18–24	220	40.4
25–34	123	22.6
35–44	84	15.3
45–54	38	7.0
>54	2	0.4
<i>Level of studies</i>		
No studies	1	0.2
Primary school	19	3.5
Secondary school	37	6.8
A Levels/High school diploma	123	22.5
Professional training	82	15.0
University studies	283	52.0
<i>Employment status</i>		
Employed/Self-employed	278	51.0
Student	214	39.3
Unemployed	35	6.4
Houseperson	16	2.9
Retired	2	0.4
<i>Device type</i>		
Smartphone	485	89.0
Tablet	60	11.0

stability of the data, a bootstrapping procedure, with 5000 subsamples, was used (Roldán and Sánchez-Franco, 2012). Multigroup analyses (MGA) using PLS-MGA (Hair et al., 2016) were performed to analyse the moderating effect.

Before the model assessment, Harman’s single factor test was performed to evaluate common-method bias (CMB). The results confirmed the absence of CMB: the total variance for any one single factor is 31.07%, less than the maximum recommended value (50%) (Eichhorn, 2014). Therefore, the data set does not suffer from CMB.

5. Findings

5.1. Reliability and validity assessment

According to Henseler et al. (2016), prior to undertaking analyses of the measurement model, it is necessary to assess their goodness-of-fit. All values were within the recommended limits: the SRMR of the saturated model (0.056) below 0.08; and the p-values of the SRMR, D_ULS and D_G2 below 0.05 (Dijkstra and Henseler, 2015a, b).

To assess the reliability of the model three criteria were followed: factor loadings, Cronbach’s alpha (CA), and composite reliability (CR). In the first place, the factorial loadings of each item on its variable must obtain values higher, or at least close to, 0.7 (Barclay et al., 1995). The results for items CE1, CS2, SE4, SE5 and SE6 were not close to 0.7, therefore they were eliminated from the analysis. CA and CR also require values higher than 0.7 (Cronbach, 1951; Nunnally and Bernstein, 1994); this was achieved in all cases (see Table 2). Convergent validity was assessed through the average variance extracted (AVE); the AVE values were above the recommended minimum (0.5) (Fornell and Larcker, 1981) (see Table 2). Therefore, reliability and convergent validity of the measurement model are confirmed by the results.

Two methods were used to evaluate the discriminant validity: the inter-construct correlations must be below the square root of the AVEs (Fornell and Larcker, 1981) and the heterotrait-monotrait (HTMT) ratio between any two reflective constructs must be above 0.8 (Henseler et al., 2016). The values are all within the recommended limits (see Table 3); thus, the measurement model has discriminant validity.

5.2. Structural model and hypothesis test

Prior to the structural model assessment, the variance inflation factor (VIF) values of constructs were examined to evaluate whether multicollinearity was present. VIF values were lower than the suggested maximum of 5 (CE→CS = 1.285; AE→CS = 1.893; RE→CS = 2.098; SE→CS = 1.292; CS→CL = 1). The R² values of each dependent variable were also examined (see Table 4). All values were above the recommended minimum 0.1 (Falk and Miller, 1992).

To test hypotheses 1–5 the significance of the β coefficients of each regression, and their p-values, were assessed. It was observed that the effects of AE (β = 0.523, p-value = 0.000), SE (β = 0.293, p-value = 0.000) and CE (β = 0.178, p-value = 0.000) on CS were positive and significant (<0.001). On the other hand, the effect of RE on CS was not significant, rejecting H3 (p-value = 0.213 > 0.05). Lastly, the effect of CS on CL was positive and significant (β = 0.639, p-value = 0.000). Therefore, hypotheses H1, H2, H4 and H5 are accepted.

Table 2
Results of reliability and convergent validity tests.

Variable	Cronbach’s alpha	CR	AVE	Cross-loadings
Cognitive Exp. (CE)	0.924	0.924	0.858	0.915–0.938
Affective Exp. (AE)	0.896	0.897	0.524	0.672–0.816
Relational Exp. (RE)	0.831	0.836	0.719	0.780–0.911
Sensorial Exp. (SE)	0.859	0.866	0.620	0.690–0.900
Satisfaction (CS)	0.708	0.704	0.545	0.678–0.794
Loyalty (CL)	0.917	0.918	0.692	0.707–0.936

Table 3
Assessment of the discriminant validity.

Variable	CE	AE	RE	SE	CS	CL
Cognitive Exp. (CE)	0.927	0.318	0.455	0.308	0.409	0.329
Affective Exp. (AE)	0.312	0.724	0.676	0.433	0.664	0.583
Relational Exp. (RE)	0.454	0.669	0.848	0.427	0.500	0.470
Sensorial Exp. (SE)	0.303	0.421	0.417	0.787	0.549	0.479
Satisfaction (CS)	0.403	0.662	0.493	0.543	0.738	0.640
Loyalty (CL)	0.325	0.578	0.465	0.473	0.639	0.832

Note. In bold the square roots of the AVEs; below the bold diagonal the Fornell-Larcker criterion results; above the bold diagonal the HTMT values.

Table 4
Results of structural model evaluation (bootstrapping = 5000; blindfolding = omission distance 7).

Hypotheses	PC	f ²	Q ²	R ²
H1. Cognitive Exp. → Satisfaction	0.178*	0.054		
H2. Affective Exp. → Satisfaction	0.523*	0.320		
H3. Relational Exp. → Satisfaction	n.s.	0.004		
H4. Sensorial Exp. → Satisfaction	0.293*	0.147		
H5. Satisfaction → Loyalty	0.639*	0.692		
Satisfaction			0.548	0.188
Loyalty			0.409	0.263

Note. PC: path coefficient; *p < 0.001; n.s.: not significant.

The f² values were used to assess effect size (Henseler et al., 2016) (Table 4). The results shown that the impact of CS on CL is strong (>0.35), that the effects of AE and SE on CS are moderate (>0.15), and that the effect of CE on CS is weak (>0.02). The Q² test was applied to study the predictive capability of the model. The model has predictive capacity for the dependent variables when Q² values greater than 0 are obtained (see Table 4). The SRMR value is less than the recommended maximum (0.08), so it is reasonable to conclude that the model has sufficient goodness of fit (Henseler et al., 2016). In addition, SRMR, D_ULS and D_G2 were carried out. These all yielded significant values (p-value <0.05), so the model has good overall fit (Dijkstra and Henseler, 2015a, b).

To test hypotheses 6a, 6b, 6c and 6d an analysis was made of the indirect effects that the 4 experience types might have on CL. To undertake the analysis, the percentiles and bias-corrected confidence intervals were examined through bootstrapping (Cepeda et al., 2017; Roldán et al., 2017). The results showed that CS with the app fully mediated between CE and CL; that is, the results showed that the direct connection between CE and CL is not significant, but that the indirect relationship between them, through satisfaction, is significant. Partial mediation exists with AE and SE. Both experience types showed significant direct effects on CL, and significant indirect effects through satisfaction. Finally, RE showed neither direct nor mediated effects on CL (Table 5).

Last of all, the moderating effects of gender, age and device type used most frequently to access the retailer’s apps (hypotheses H7a, H7b and H7c) were tested through three multigroup analyses (MGA), using PLS-MGA (Hair et al., 2016). For this, each moderating variable was categorised into two values that were used to divide the sample into subgroups. Gender was divided into men and women. As to age, users were split based on the median value, resulting in a group up to and including 34 years of age, and another over 34 years. As to device type, the sample was divided into smartphone and tablet users. First, the invariance of the measurement instrument was checked to confirm that possible differences were not due to differences in the measurement models of each group. After these checks, the MGA was carried out (Table 6).

The results showed that the model relationships have significant differences considering gender, age and device type. Specifically, RE effect on satisfaction is greater among men (p-value = 0.055 < 0.10) than among women. Moreover, SE has greater influence on CS among

Table 5
Results of mediation analysis.

Direct effects	PC	Bootstrap 95% CI			
		Percentile		Bias Corrected	
		Lower	Upper	Lower	Upper
Cognitive Exp. → Loyalty	0.039	-0.048	0.126	-0.048	0.126
Affective Exp. → Loyalty	0.230**	0.092	0.357	0.095	0.36
Relational Exp. → Loyalty	0.056	-0.062	0.169	-0.061	0.17
Sensorial Exp. → Loyalty	0.144**	0.046	0.239	0.046	0.239
Indirect effects	PE	Percentile		Bias Corrected	
		Lower	Upper	Lower	Upper
Cognitive Exp. → Satisfaction → Loyalty	0.065	0.020	0.139	0.020	0.138
Affective Exp. → Satisfaction → Loyalty	0.192	0.094	0.335	0.092	0.332
Relational Exp. → Satisfaction → Loyalty	-0.022	-0.042	0.036	-0.041	0.036
Sensorial Exp. → Satisfaction → Loyalty	0.101	0.047	0.203	0.045	0.200

Note. CI: confidence intervals. PE: point estimate; PC: path coefficient; **p < 0.01.

Table 6
Evaluation of the multigroup analyses (MGA).

Hypotheses	Gender		Age		Device	
	Path diff.	p-value	Path diff.	p-value	Path diff.	p-value
H1. Cognitive Exp. → Satisfaction	0.011	0.555	0.154	0.976	0.093	0.744
H2. Affective Exp. → Satisfaction	0.007	0.532	0.186	0.988	0.157	0.898
H3. Relational Exp. → Satisfaction	<i>0.153</i>	<i>0.055</i>	0.006	0.475	0.011	0.468
H4. Sensorial Exp. → Satisfaction	0.031	0.350	<i>0.115</i>	<i>0.073</i>	<i>0.203</i>	<i>0.074</i>
H5. Satisfaction → Loyalty	0.074	0.150	0.155	0.986	0.061	0.731

Note. Italics typeface indicates significant differences.

those of up to 34 years of age (p-value = 0.073 < 0.10) than among the 35 and older group. Furthermore, SE also has a greater impact on CS among individuals who use smartphone-based apps (p-value = 0.074 < 0.10) than among individuals who use tablets. Therefore, it can be stated that hypotheses H7a, H7b and H7c are partially supported. Fig. 2 shows the results of the conceptual model assessment.

6. Discussion

6.1. Theoretical implications

The present research makes some original contributions to the CX and CL literature. Firstly, until recently, few studies examined the impact of customer retail app experiences on customer-retailer relationships. In fact, most of the recently conducted research on retail apps explores the mechanisms of adoption, satisfaction and loyalty individuals have of apps. This research therefore contributes to CX literature by providing additional insights into the particularities of a firm-controlled touchpoint customer experience (i.e., retail apps) on customer retailer loyalty. Secondly, while Molinillo et al. (2020a) y Japutra et al. (2021) recently conducted similar studies, this research builds on their contributions by analysing the effect of customer retail app experiences more closely by considering four dimensions (i.e., cognitive, affective, relational and sensorial). Furthermore, while other research measured CX by way of second-order construct (e.g., McLean et al., 2018; Roy et al., 2017), in this research we measured a conceptual construct made up of four first-order constructs. This multidimensional CX conceptualisation, based on the main powers of the mind (Pinker,

1998) and recent work on the online space (Bleier et al., 2019; Hoyer et al., 2020), reveals which app features need to be bolstered in order to increase customer satisfaction and customer retailer loyalty.

Third, it was shown that three of the four dimensions of experience significantly influence customer satisfaction. Some previous research on mobile apps demonstrated the impact one (e.g., Japutra et al., 2021; McLean et al., 2018; Xu et al., 2015) or two of these dimensions (e.g., Alnawas and Aburub, 2016; Molinillo et al., 2020a) have on customer satisfaction but, to our knowledge, this is the first research project that studies the joint effects of the four dimensions and confirms the statistical significance of the influence of three of these dimensions.

In this respect, it should be noted that it was demonstrated that the effects of affective and sensorial experiences on satisfaction were greater than the effect of cognitive experience. These results show the key role affective dimension plays even though it was underestimated when compared to the cognitive dimension in some retail app-based research (e.g., McLean et al., 2018). This may be because apps are now so standardised in their features, and easy to use, that consumers operate them almost instinctively, that is, without significant cognitive effort. This research also makes an original contribution by demonstrating that the sensorial experience not only plays an important role in achieving customer retail app satisfaction, but its impact on satisfaction is even more significant than that of cognitive experience. Customers value the ability of apps to please and satisfy them in pleasant and sensorial appealing ways, which reinforces the importance of the hedonic value of the shopping experience. This contribution can help researchers identify the impact of specific sensorial properties (e.g., colour, sound, design).

Fourth, the impact of satisfaction with the app on CL was demonstrated. This effect is coherent with the integrated view of the CX at all of the customer's points of contact with the retailer throughout the customer journey. This contribution is of great importance, as previous studies into user behaviour and retail apps mainly focused on the effect of the user experience on the consumer's likelihood of making additional purchases on the app (e.g., Iyer et al., 2018). This study reinforces the results of the few works that have demonstrated that satisfaction with an app can impact on customers' relationships not only with the app, but with the retailer itself (Japutra et al., 2021; Molinillo et al., 2020a). In addition, the results demonstrated indirect effects of cognitive, affective and sensorial experiences on loyalty towards retailer through satisfaction with the app, and direct effects of affective and sensorial experiences on loyalty. This is an additional novel finding provided by our research because it reveals the significant direct and indirect impact that the sensorial dimension has on the customer app experience and on customer retailer loyalty.

Fifth, the impact of the relational dimension on customer satisfaction could not be supported. This result, although unexpected, is important because it underscores the differences that exist between web- and app-based consumer experiences which previous research projects identified as the social dimension (e.g., Bleier et al., 2019; Cachero-Martínez and Vázquez-Casielles, 2021; Molinillo et al., 2020b). This may be because social features on retail apps are not fully developed and because customers prefer to interact on their usual social networks and instant messaging apps than on purchasing apps that have essentially been designed for making purchases.

With regards to moderating effects, this study identified significant differences that gender, age and device type produce on the impact that CX has on customer satisfaction. Previous studies examined the individual effect of these variables on app user behaviours (e.g., Lim et al., 2021; Pandey and Chawla, 2018). However, the findings of this study are novel because, until now, no study had analysed the impact of these three moderating effects on the customer retail app experience. We are now able to identify the moderating capacity of each factor but also benchmark their impact.

More specifically, the results revealed that age and device type influence the impact a sensorial experience has on customer satisfaction. In fact, this influence is more significant among younger users (<=34

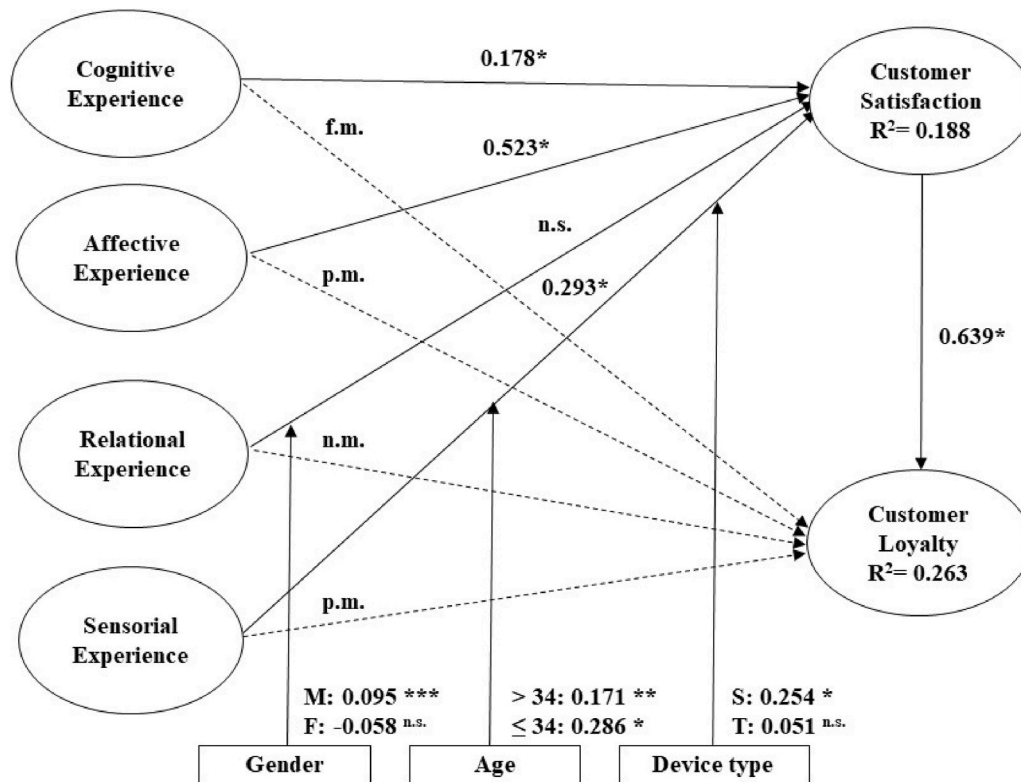


Fig. 2. Results of conceptual model assessment.

Note: Continuous lines indicate direct relationships and dotted lines represent indirect effects (mediated relationship); M: male, F: female; S: smartphone, T: tablet; f. m.: full mediation, p.m.: partial mediation, n.m.: no mediation; *p < 0.001; **p < 0.01; ***p < 0.1; n.s.: not significant.

years old) and those who use smartphones (vs. tablets). This may be because younger users tend to have more hedonic motivation when making purchases than older users (San-Martín et al., 2015), which may lead them to enjoy app interface and design properties more. As for device type, the findings were unexpected because one may have expected the sensory experience to be heightened when using larger screen devices (i.e., tablets) (McLean et al., 2020).

Lastly, while the effect of relational experiences on customer satisfaction is not statistically important for the sample taken, it is important among men. This result is ground-breaking because previous studies indicated that the highest level of social motivation could be found among women (Kotzé et al., 2012). However, this novel finding for retail apps reinforces the authors' conclusions, suggesting that women are less interested in engaging online (Zhou et al., 2007) and in hearing from other users to inform their purchasing decision (Frank et al., 2014). Therefore, the results extend the findings of the previous literature in three ways: first, by demonstrating, in the same context, the moderating effect of two user characteristics (age and gender) and device type used; second, by showing the moderating effects of these features on the effect of experience on satisfaction with the app; third, by identifying which precise dimensions of CX (i.e., sensorial and relational) are moderated.

6.2. Managerial implications

These findings can help retailers increase customer app satisfaction through CX management, as a means of improving loyalty itself. First, retailers should pay special attention to the management of affective experience as it has the greatest effects on satisfaction. To do so, apps should generate positive emotions by providing comfortable, fun, exciting, pleasant, entertaining and intuitive navigation experiences. For example, an app can have a user-friendly layout, making it easy to access different features quickly, including interactive content which makes the experience more fun. Retailers can also make exclusive offers

that render the shopping experience more pleasant, including palatable colour schemes, augmented or virtual reality features, or even games which help you earn points. Customer satisfaction, therefore, depends, to a large extent, on how pleasant the app is.

Second, sensorial experience also holds great importance for customer satisfaction. Therefore, retailers must pay attention to the app's visual aesthetics (structure, colours, legibility, etc.) and the atmosphere it generates through sensorial elements such as sounds, vibrations and the finger movements it requires. For example, the sensorial stimuli for retail apps selling high value utilitarian products, such as food, are much simpler and retailers should seek to accurately display products. However, the sensorial stimuli for higher hedonic value products, such as fashion, needs to be achieved by representing lifestyle experiences. In all cases, it is important to take care of the look and feel by using colours and fonts that are curated for the target audience, the type of product and the mobile environment. Sounds and vibrations, such as alerts and notifications, and screen product rotations, can be included as personalisation options so that they are not intrusive or bothersome.

Third, while cognitive experience influences customer satisfaction to a lesser extent than do affective and sensorial experiences, retailers should not neglect the app's technical characteristics, functionality, the information it provides or its usefulness. Retail apps need to offer all the necessary information on products, the purchasing process and store locations. Retailers also need to pay attention to the technical aspects of apps, such as engagement speed, the ease of flow between sections/processes, product location, intuitive navigation, simple menus with easy-to-understand icons for the main sections and accessibility for users with disabilities, among others.

On the other hand, unlike other online media, such as social networks and websites with user-generated content that evaluate, compare and recommend products, the social experience lived through retailers' apps does not influence user satisfaction. Therefore, while retailers

might include functionality that facilitates social interaction, they are recommended not to allocate much resource to this as its effect on user satisfaction is not significant. However, if the target market is mainly men, the app should enhance relational experience more than if it was targeted at women. Retail apps will often ask clients to indicate their gender during the set-up process. This is to offer a curated user experience, tailored products and recommendations, advertising, newsletters and product ratings.

Similarly, if the retail app is mostly aimed at individuals under the age of 34, retailers need to pay more attention to aesthetics and sensory design than if they were targeting an older audience. For example, the design, colours and messaging (among others) used for clothing apps targeting young people must be able to grab their attention instantaneously. The design should mimic the layout of social network pages, which already have a consolidated following among this target group. Retail apps targeting older age groups, such as home hardware retailers, must adopt a clutter-free design that encourages mindful purchasing choices. For example, the app should include soft, simple shapes and include price comparison and product property features.

The practical implications derived from the moderator effect of customer characteristics (i.e., gender and age) are easier to implement when the retailer hones in on one specific group (e. g., young women). However, if the retailer targets different genders and ages (e. g., department store), the implementation of these recommendations will require a high technical level of sophistication that allows apps to be customised and designed according to customer expectations.

Finally, apps should be adapted to the device on which they are downloaded. Thus, if the app is smartphone based, more focus should be put on the sensorial experience than if it is tablet based. For example, individuals use their smartphones almost everywhere (e.g., buildings, outdoors) while tablets are mainly used at home. Individuals on smartphones also take faster decisions than users on tablets. Therefore, the sensorial design of an app should contemplate the type of device it will be used on. This includes using a responsive layout that adapts to different types of devices or a type of identification system that uses the device's camera or geolocation to automatically adjust the colours and brightness of the screen based on external conditions.

6.3. Limitations

This research has some limitations that must be considered. First, the

sample is made up of Spanish users who participated following a non-probabilistic procedure. Future research might evaluate the research model in other cultural contexts, combine various survey modes (Guinalú and Díaz de Rada, 2021) and use probability sampling, which would reinforce its validity. Furthermore, the information obtained from the surveys should be complemented with data on users' actual interaction with an app. This would enable comparison of the expressed opinions with the recorded actual behaviours.

Furthermore, CX was conceptualised based on four first-order constructs proposed by Bleier et al. (2019); other authors have suggested conceptualisations using different dimensions (see Appendix). Future studies should compare the predictive capabilities of alternative models using different CX conceptualisations. Moreover, CX is analysed only in the app channel, but previous studies showed that channel synergies impact consumer behaviour (Flavián et al., 2020). It would therefore be interesting to study CX from an omnichannel perspective and measure the contribution each touchpoint makes along the customer journey.

This study examined the moderating effect of two user characteristics (gender and age) and one access device characteristic (smartphone vs. tablet). Future research projects will be able to significantly contribute to this analysis by including other variables which have been important in other studies. For example, user personality (Calvo-Porrá and Otero-Prada, 2020) or the technological embodiment continuum by differentiating between handheld devices (smartphones and tablets) and PCs (laptops and desktop computers) (Barta et al., 2021).

Finally, each participant responded considering the mobile retailer application they use most regularly, so the responses refer to apps from different sectors (fashion, food, sports, electronics, etc.), which could influence the experience. Future studies might analyse CX based on the types of products marketed through the apps.

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Appendix. Key articles on Customer Experience for this research

Authors	Construct	Conceptualisation	Experience Dimensions	Context
Schmitt (1999)	Customer Experience	Five first-order constructs	Sensorial (sense), affective (feel), creative cognitive (think), physical-behavioural-lifestyles (act) and social-identity (relate)	Brands
Novak et al. (2000)	Online Customer Experience	One first-order construct	Cognitive experiential state (flow)	World Wide Web
Gentile et al. (2007)	Customer Experience	Six first-order constructs	Sensorial, emotional, cognitive, pragmatic, lifestyle and relational	Brands
Schouten et al. (2007)	Customer Experience	One first-order construct	Product, brand, company, other and owners	Brand communities
Verhoef et al. (2009)	Customer Experience	Four first-order constructs	Cognitive, affective, emotional, social and physical	Multichannel Retailers
Brakus et al. (2009)	Brand Experience	A second-order construct with four dimensions	Sensory, affective, intellectual and behavioural	Brands
Iglesias et al. (2011)	Brand Experience	A second-order construct with four dimensions	Sensory, affective, intellectual and behavioural	Brands
Rose et al. (2012)	Online Customer Experience	Two first-order constructs	Cognitive experiential state and affective experiential state	e-Retailers
Trevinal and Stenger (2014)	Online Shopping Experience	Four first-order constructs	Physical, ideological, pragmatic and social	Online Shopping
Martin et al. (2015)	Online Customer Experience	Two first-order constructs	Cognitive experiential state and affective experiential state	e-Retailers
Lemon and Verhoef (2016)	Customer Experience	A second-order construct with five dimensions	Cognitive, emotional, behavioural, sensorial, and social	Omnichannel Retailers

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Authors	Construct	Conceptualisation	Experience Dimensions	Context
Srivastava and Kaul (2016)	Customer Experience	A second-order construct with four dimensions	Feel, relate, sense, and think	Retail
Homburg et al. (2017)	Customer Experience	Five first-order constructs	Sensorial, affective, cognitive, relational and behavioural	Multichannel Firms
McLean et al. (2018)	Customer Experience	A second-order construct with two dimensions	Level of satisfaction with the experience and positive emotions	Retailers' Mobile Apps
Bleier et al. (2019)	Online Customer Experience	Four first-order constructs	Informativeness, entertainment, social presence and sensory appeal	Online retailing
Herhausen et al. (2019)	Customer's Internet Shopping Experience	One item.	Percentage of internet purchases from overall purchases	Multichannel Online-offline channel integration
Hoyer et al. (2020)	Customer Experience	A second-order construct with four dimensions	Cognitive, emotional, sensory and social	Artificial Intelligence Technologies
Molinillo et al. (2020a)	Customer Experience	Two first-order constructs	Cognitive and affective	Retailers' Mobile Apps
Tyrväinen et al. (2020)	Customer Experience	Two first-order constructs	Cognitive and emotional	Omnichannel retail
Cachero-Martínez and Vázquez-Casielles (2021)	Online Customer Experience	Five first-order constructs	Visual, intellectual, social, pragmatic and emotional	e-Retail
Gao et al. (2021)	Customer Experience	Two first-order constructs	Cognitive and affective	Omnichannel retail
Japutra et al. (2021)	Customer Experience	Four first-order constructs	Sensory experiential state, affective experiential state, interactivity and relative advantage	Retailers' Mobile Apps

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