M-Commerce: The Nexus between Mobile Shopping Service Quality and Loyalty

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Abstract
Whilst M-commerce is having a major influence in the way businesses and consumers interact, mobile shopping service quality (MS-SQ) has been understudied in the literature. This paper examines MS-SQ within a conceptual model of customer satisfaction and loyalty surveying UK customers who bought fashion clothing via their mobile devices. The results of two empirical studies confirm four dimensions of MS-SQ: efficiency, fulfilment, responsiveness and contact. Using bootstrapping of 2000 resamples, SEM results showed a significant impact of MS-SQ on customer satisfaction, which in turn impacts loyalty. These results are robust across two samples. Only the dimension efficiency exhibits an indirect effect on loyalty via satisfaction in both studies whilst controlling for gender, age, income, value of clothing item, and m-shopping experience. These findings are discussed and have managerial implications for retailers operating m-commerce sites.

Keywords – M-commerce, Mobile Shopping Service Quality, Satisfaction, Loyalty, Omnichannel Retailing, Smart Phones

1. Introduction

Along the expansion of the internet and mobile technologies, the landscape of business has changed considerably within the past two decades. Lamberton and Stephen (2016, p. 146) refer to the "digital transformation of marketing" which is reflected "in the ways that firms and customers have embraced new technologies and, most interestingly, how technology has facilitated novel market behaviours, interactions and experiences". Technological breakthroughs provide new opportunities and can "create new ways for suppliers to engage with customers to co-create innovative goods, service and experiences" (Payne et al., 2008, p. 88). Similar to the introduction of e-commerce, m-commerce is having a major influence in the way businesses and consumers interact with one another (Huang et al., 2015).

As mobiles have become essential devices of consumers' daily life, they provide an effective platform for marketers to reach, interact and serve customers anytime, anywhere (Wang et al., 2015). Nielsen (2015) reports that there is a shift towards more convenient 'on-the-go' mobile platforms providing retailers an opportunity for showcasing their brands and shopping experiences even when the customer is not in the store. In more recent years, with the introduction of mobile commerce, the sector has shifted considerably from more fixed desktop platforms to sales that are completed through mobile platforms such as smartphones or tablets. According to Mahapatra (2017) mobile devices are becoming effective channels for shopping experiences due to the factors of convenience (search, evaluation, possession and post-purchase). Similarly, Pantano and Priporas (2016) concluded that consumers are switching to mobile channels from e-channels because of the possibilities for consumers to live enhanced shopping experiences, thus forcing retailers to amalgamate physical store environments with mobile shopping opportunities to successfully compete in the dynamic and multichannel retail landscape.

Organisations fundamentally exist to create value and superior experiences for their customers (Verhoef et al., 2009). To achieve this goal, a strategy for firms is to deliver excellent services or superior service quality (Huang et al., 2015). Previously, scholars have tried to produce and validate measurement scales of service quality within online environments. Notable frameworks like the E-S-QUAL (Parasuraman et al., 2005) have been examined in a broad range of contexts. Nevertheless, despite the growing m-commerce market (eMarketer, 2020a), research examining MS-SQ is still in its infancy. There have been several calls to comprehend service quality in the context of a fast-growing smart phone market, particularly when customers may evaluate dimensions of service quality differently for mobile and online environments (Arcand et al., 2017). Based on the work of Parasuraman et al. (2005), Huang et al. (2015) created the M-S-QUAL scale to measure service quality delivered through mobile devices and platforms in Taiwan. Acknowledging cultural differences and mobile phone usage between countries, these authors urge researchers to validate the M-S-QUAL scale in other contexts and countries. Hence, this paper makes contributions to the emerging stream of mobile marketing and, in particular, of MS-SQ through an empirical study in the UK context by testing an adapted and modified M-S-QUAL scale.

Furthermore, it is important for marketers implementing m-commerce strategies to fully understand the nexus between MS-SQ and customer loyalty. Mobile shopping opportunities and choices for consumers have increased significantly over the last decade. In shifting from traditional retail stores to mobile websites and applications, retailers encounter tough challenges in building and nurturing relationships with customers (Arcand et al., 2017). Engaging and retaining mobile customers requires firms to embrace mobile channels with the development of sound strategies that will emphasise and communicate the value and benefits of the mobile store services (Laukkanen, 2016). Therefore, this study makes additions to the

evolving stream of mobile marketing literature by examining the role of MS-SQ and satisfaction in creating customer loyalty. It is argued that loyal customers are key to the success of organisations, especially in today's increasingly competitive and multichannel retailing environments (Calvo-Porral and Lévy-Mangin, 2015). So far, our understanding on what drives consumers to use repeatedly a retailer's mobile site along the customer journey has been based on limited research conducted in the field of mobile marketing (Thakur, 2016; Groß, 2018). Some research has explored the influence of mobile service quality on satisfaction but the focus has been mainly on mobile banking (Shunbo et al., 2016; Thakur, 2014). To our knowledge, the direct and indirect effects of MS-SQ on loyalty via satisfaction have still to be thoroughly studied in the mobile shopping environment. Hence, the present study seeks to provide insights into this specific area.

Therefore, the purpose of this research is to test a conceptual model of MS-SQ, satisfaction and loyalty in a retail setting such as the fashion/clothing sector and provide practical guidance to management pursuing m-commerce strategies. The study's specific objectives are to i) identify the attributes and factors customers consider when evaluating MS-SQ and ii) explore how the dimensions of MS-SQ impact customer satisfaction and loyalty within a retail clothing setting.

In summary, our research makes contributions to marketing knowledge in three ways. First, it contributes to the growing research body of m-commerce and in particular to m-shopping service quality by conceptualising m-shopping service quality as a second order construct within a conceptual model. Second, this research studies the direct and indirect effects of m-shopping service quality on satisfaction and loyalty enriching our understanding of the dimensions driving satisfaction and loyalty in m-commerce environments whilst controlling for gender, age, income, frequency of purchase and value of item purchased.

Third, this research confirms the dimensions of the measurement scale proposed by Huang et al (2015) in a UK fashion clothing context using data from student and consumer samples.

Also, this paper aims to provide useful insights for the industry as mobile service providers have been looking for answers of how to improve their services and obtain a competitive advantage (Lu et al., 2009). Findings will help managers and designers of mobile shopping websites and applications better understand the dimensions that are important in forming mobile service quality, how it can be enhanced, and further improve customer satisfaction and loyalty levels.

The paper is organised as follow: first, the study's context is discussed; second, the literature offers insight into previous research related to MS-SQ and displays the conceptual model guiding the study as well as the hypotheses; third, the research methodology is outlined; fourth, the analysis and presentation of key findings are summarised; fifth, findings are discussed and concluding remarks are offered.

2. Research background and hypotheses

2.1. M-Commerce

According to Shankar et al. (2010, p. 112), a mobile device is "not just a technological gadget, but a cultural object as well" as many people are experiencing the mobile lifestyle. Nowadays, most people keep their mobile devices constantly within arm reach throughout the day and night. Mobile devices are considered personal, individualised tools which people use not only for talking and texting, but for a whole range of activities relating to shopping (product information search, product review, comparison and rating, shopping lists, and purchases) social media networking, entertainment, banking, browsing information etc. (Shankar et al., 2010; Grewal et al., 2016).

Wang et al. (2015) reported an increase in order rates per year through mobile devices as customers are adopting mobile shopping. According to Statista (2020), global m-commerce sales were £1.76 trillion in 2019 and are expected to reach £2.21 trillion in 2020. In the UK, total retail m-commerce sales reached £50.36 billion in 2019, which are expected to grow to £61.14 billion in 2020 and exceed £105 billion by 2024 (eMarketer, 2020a). Retail m-commerce sales accounted for 48% of total ecommerce sales and 10.4% of total retail sales in 2019. Smartphones and tablets accounted for 62.5% and 36.7% of m-commerce sales respectively (eMarketer, 2020b).

Interestingly, a quarter of digital marketing budgets were spent on mobile marketing in 2015 in response to the growing demand of mobile shoppers (Shankar et al., 2016). Some of the mobile marketing activities performed by retailers are the creation of mobile websites and development of mobile shopping applications, mobile customer service, communication through mobile email and messaging, mobile advertising and mobile couponing (Thakur, 2016).

The fashion industry is globally worth more than £2 trillion (McKinsey, 2020). In the UK, the fashion sector contributes more than £32 billion a year towards GDP and employs about 890,000 employees (Sleigh, 2018). The fashion sector has been considered as one of the most creative sectors in the UK (Sleigh, 2018). However, it is a very competitive sector which faces many challenges. Recent trends indicate that fashion consumers value online and mobile shopping as it fits with their busy lifestyles. According to Mintel's online fashion report, online sales of fashion items in the UK increased by 26% in 2020 to reach £24.5 billion (Mintel, 2020). Fashion online sales accounts for 30% of overall online sales in the UK (ecommercedb, 2020). This unexpected growth in online sales was caused by the lockdown period because of Covid-19 as all non-essential shops closed their doors to customers (Mintel, 2020). This trend of online shopping continued even after the easing of lockdown because of

changing consumer behaviour favouring to continue shopping online. Mintel (2020) reports that 68% of surveyed consumers bought clothes online in the last year. Therefore, it is essential that fashion retailers understand how they can improve their MS-SQ to be able to sustain competitive advantage in this tough market.

Whilst advanced mobile communication technologies and devices have enabled a range of m-commerce applications, businesses "do not fully understand the new paradigm involved" (Huang et al., 2015, p. 126). It is therefore of great importance for firms wishing to take advantage of the great opportunities of m-commerce to provide excellent service and create unique experiences for their customers. However, delivering superior services over mobile devices requires sound understanding and measurement of the important factors of MS-SQ. Furthermore, it is of great importance for firms to understand how superior MS-SQ contributes to customer satisfaction and loyalty.

2.1.1. *M-commerce, mobile marketing and the fashion industry*

As fashion is constantly changing, large customer segments seek to know and wear the latest fashion trend (Soni et al., 2019). Purchasing new outfits has never been easier today. We live in the era of digitalisation, where everything is available via mobile devices at the touch of the fingertip. It is the nature of the mobile market that has changed traditional bricks and mortar retail and marketing (Rowles, 2017). Previously, people were depended on the brick and mortar stores, but the launch and success of e-commerce has changed people's shopping habits. The launch of mobile shopping sites and apps has not only simplified the shopping experience, but have also enhanced it (Soni et al., 2019). The retail industry has recognised the potential that mobile technology provides, that is the opportunity to get closer to consumers and convert sales without customers needing to visit any physical stores (Groß, 2015).

Consumers have now become more aware of alternatives through researching products online via mobile devices. This is forcing traditional fashion retailers to move into mobile marketing to enhance the shopping experience. More specifically, fashion retailers have started to invest big into creating the best experience of their mobile shopping site and apps. Through these mobile sites and apps, consumers can browse for various clothing options, with no place and time related restrictions. Fashion mobile shopping sites and apps allow consumers to browse multiple stores, get product and variant information, discount, availability and then purchase anytime depending on the best options available (Soni et al., 2019). By browsing products as per their interests, consumers can now make smart purchase decisions, experience better navigation of the products and store. As fashion mobile shopping applications are usually well integrated with top social media apps, users can easily and quickly inform their peers about their preferences and purchases. This, not only raises a discussion regarding the clothing products, by enabling consumers to check and recommend products to their friends via their social media profiles (Pelet and Papadopoulou, 2015), but also results in broader WOM marketing compared to similar offline strategies (Soni et al., 2019).

Fashion mobile shopping sites and apps provides brands with numerous opportunities to enhance customer experience. Users also get notifications and personalised communication about special offers, new fashion trends and products, all based on their browsing history, something that further enhances their shopping experience (Magrath and McCormick, 2013). For example, the fashion retailer ASOS provides an easy to use mobile application with the ability to save items for later and view recommended items based on previous purchases. This is a great example of personalisation, which is an important factor in providing customers with an engaging and interesting experience using the mobile site or app (Gains, 2016). More personalised content provided through a mobile shopping app, creates continuous

engagement, and ensures that customers mainly see content that is of value to them, rather than generic content, which could lead to abandoning the application and not purchasing at all. Such continuous engagement is vital to drive repeat purchases (Chaffey, 2016).

2.1.2. Customer loyalty in a digital era

A major challenge facing online retailers is customer loyalty (Herhausen et al. 2019; Rafiq et al., 2013), and relevant literature has been showing a continuous and increasing interest in strategies where the focus is on building customer loyalty. Customer loyalty is the main goal of relationship marketing and is directly linked to profitability (Heskett et al., 2008; Rust and Zahorik, 1993). Wang et al. (2000) argue that long-term profitability and sustainability in the online marketplace will only be achieved when online retailers embrace the challenge of enhancing online customer loyalty. Authors have argued that understanding how to develop loyalty is significantly important to all online retailers (Goode and Harris, 2007; Reichheld, 2001; Zeithaml et al., 2002).

The rapid growth and ubiquitous adoption in digital technologies and the digital transformation of business (Graesch et al., 2020; Quinn et al., 2016) have brought major changes in consumer shopping behaviour and the customer journey, which has become more complex and extensive for retailers to manage and to create customer loyalty (Tupikovskaja-Omovie, & Tyler, 2020; Lemon and Verhoef, 2016; Leeflang et al., 2014). The innumerable touchpoints generated by the increased use of new technology devices and new digital channels offer customers more options to create their own journey while challenging retailers to retain customers along the pathway-to-purchase and restrict diversions to competitors (Lemon and Verhoef, 2016). Mobile technology, shopping apps, location-based services and mobile wallets are an integral part of consumers' daily live impacting the consumer experience (Bolton et al., 2018; Shukla & Nigam, 2018). As Parise et al. (2016) note

customers are increasingly becoming omnichannel shoppers, using multiple channels such as physical stores, websites, social platforms, and mobile apps to conduct a single transaction". Nonetheless, Herhausen et al. (2019) mention that mobile devices are important 'journey starters' and play a significant role in the path to purchase. Thus, today's empowered customers can instantly and effortlessly look for alternative or competitive products and prices on their mobile devices which are becoming more instrumental in customers' journeys (Alalwan et al., 2020).

In a highly competitive environment, inspiring customers throughout their journey and creating repeat business is now a key priority for retailers' survival (Herhausen et al., 2019). The new digital landscape allows for greater personalised interaction and richer exchange of information among customers and brands along the pathway-to purchase (Bolton et al., 2018). Retailers can gain valuable insights from social media engagement on mobile devices at each stage of the customer journey (Alalwan et al., 2020). By understanding omnichannel customer behaviours and using digital technology and tools (e.g. tracking capabilities of mobile devices, location-based advertising, customer analytics etc), retailers can provide not only customers a richer experience with the provision of the right information along the purchasing journey but also influence customers purchase decisions at any time in any place (Fernández-Rovira et al., 2021; Savastano et al., 2019). It provides opportunities for retailers to design customers journeys beyond the generation of instant sales and to focus on strengthening relationships with customers and building long-term customer loyalty. Thus, while digital technologies allow retailers to collaborate with consumers to create loyalty (Crittenden et al., 2019), it is imperative to understand "sources of loyalty during the customer journey…particularly in light of the increasing number of touchpoints that may divert customers along their journey" (Herhausen et al., 2019, p. 10).

This contextual overview highlights some of the developments in retailing in general, and mobile marketing and m-commerce in particular. There is, however, limited empirical research on specific areas of mobile marketing, particularly in measuring and linking MS-SQ, customer satisfaction and loyalty. Thus, there is an important contextual relevance to this research study.

2.2. Research Model and Hypotheses

Service quality has become the focus of organisations in today's customer-centred business environments (Blut, 2016). Zhao et al. (2012) have mentioned the quality of services ultimately impacts how the customer evaluates the company and this will have a continuing effect in the consumers' minds leading to repeated and more frequent purchasing behaviour. However, understanding and enhancing service quality requires the measurement and identification of its components (Blut, 2016; Stiakakis and Georgiadis, 2011).

Early research (Parasuraman et al., 1988, p. 15) described service quality as a "consumer's judgment about an entity's overall excellence or superiority" or "the overall evaluation of a service firm" arising from evaluations of a firm's performance with customers' expectations. Adapting Zeithaml's (2002) conceptualisation of e-service quality, MS-SQ is described as "the extent to which a mobile channel facilitates efficient and effective shopping, purchasing, and delivery of products and services".

While studies have examined mobile service quality in contexts such as mobile services and networks, or mobile banking, research on MS-SQ is lacking and to our knowledge, the recent study of Huang et el. (2015) is the only investigation of MS-SQ. Thus, much of our understanding on MS-SQ originates form online service quality frameworks such as the E-S-QUAL (Parasuraman et al., 2005), e-shopping quality (Ha and Stoel, 2011) and website service quality (O'Cass and Carlson, 2012). Whilst mobile commerce is considered a

subcategory of electronic commerce, it has its own characteristics (Özer et al., 2013). Mobile platforms are used in slightly different ways and it is not clear as to whether the same dimensions that established studies use to evaluate online service quality, still apply in mobile platforms.

When evaluating services on mobiles, researchers identified four key elements for success; convenience, ubiquity, localisation and personalisation (Clarke and Flaherty, 2003). Choi et al. (2007) used fuzzy set theory to examine mobile service quality employing a sample of 108 users of mobile network operators in South Korea. Their study suggested six factors relating to M-S-QUAL: device, network, security, contents, convenience and customer support. Four factors of service quality for mobile networking services in Taiwan were identified by Kuo et al. (2009): connection speed, navigation, content quality, customer services and system reliability, visual design. Examining mobile brokerage service quality, Lu et al. (2009) created and tested a hierarchical multidimensional model in China. The primary dimensions proposed by these authors were environment quality (equipment, situation, design,), interaction quality (expertise, attitude, information, problem solving) and outcome quality (valence, tangibles, punctuality). Stiakakis and Georgiadis (2011) provided empirical support for the hierarchical model of Lu et al. (2009) using a sample of 260 mobile services users in Greece. However, they added the sub-dimensions security/privacy and customization/personalization, and omitted the dimension attitude. As mentioned earlier, these research studies have focused mainly on mobile services/networks and the M-S-QUAL scales have not been tested in a mobile shopping setting. It is only recently that Huang et al. (2015) offered a thorough investigation of mobile service quality for shopping experiences and validated M-S-QUAL scales for physical and virtual products. Their study presented a fifteen-item, four-dimension scale (responsiveness, efficiency, fulfilment and contact) for

physical product shopping and a sixteen-item, five-factor scale (responsiveness, efficiency, fulfilment, contact and privacy) for virtual product shopping.

Customer satisfaction is described by Rust and Oliver (1994, p. 2) “as a summary cognitive and affective reaction to a service incident (or sometimes to a long-term service relationship)” resulting “from experiencing a service quality encounter and comparing that encounter with what was expected”. It is a post-purchase evaluation between prior expectations and real consumption experiences. In this study, satisfaction is perceived “as the contentment of the customer with respect to his or her prior purchasing experience with a given m-commerce firm” (Anderson and Srinivasan, 2003, p. 125).

Zeithaml et al. (1997) argued that the key factor which determines customer satisfaction is her/his own assessment of service quality. Cronin and Taylor (1992) have reported a direct association between service quality and satisfaction. This relationship has also been observed within the M-S-QUAL field (Kuo et al., 2009; Santouridis and Trivellas, 2010; Zhao et al., 2012), where higher levels of mobile service quality can result in greater satisfaction. Recent research studies (Zhao et al., 2012; Özer et al., 2013; Shin, 2015;) involving mobile devices have all reported significant relationships between dimensions of mobile service quality and customer satisfaction. For example, “billing system, pricing structure and customer service” were the mobile service quality factors having a significant positive effect on satisfaction in Santouridis and Trivellas (2010) while “availability and ease of use" exhibit the greatest impact on satisfaction in Özer et al. (2013). This stresses an importance for customer satisfaction to be researched within the area of MS-SQ (Figure 1). Thus, the following hypotheses are proposed:

H1: MS-SQ will have a positive impact on customer satisfaction.

H1a: The dimensions of MS-SQ will have a positive impact on customer satisfaction.

Anderson and Sullivan (1993) have found that satisfaction is a requirement for loyalty to exist. When customers are pleased with a firm's offering, they are more likely to continue to interact with the brand and become loyal to the firm (Nysveen and Pedersen, 2014). Anderson and Srinivasan (2003, p. 125) described e-loyalty "as the customer's favorable attitude toward an electronic business, resulting in repeat purchasing behaviour". In a mobile shopping environment, loyalty is defined "as a consumer's strong commitment to re-use the mobile channel consistently in the future" (Groß, 2018, p. 150). It is argued that loyalty encompasses behavioural and attitudinal elements, whereby the first one relates to repeated purchases through mobiles devices and the latter refers to the degree of commitment derived from the unique value associated with the mobile channel (Lin and Wang, 2006; Groß, 2018).

Customer satisfaction not only increases loyalty to a brand or m-shopping but also prevents customers from switching to other competitors and across other shopping channels (Huré et al., 2017; Sohn, 2017; Groß, 2018). In a recent investigation of mobile shopping, Thakur (2016) reported a significant impact of satisfaction on loyalty intensions. In a mobile commerce setting (Lin and Wang, 2006), customer satisfaction affects mobile customer loyalty acting as a mediator among perceived value and loyalty. Examining mobile telephony services, Santouridis and Trivellas (2010) concluded that customer satisfaction exercises mediating effects on the association between service quality and customer loyalty. Comparable findings have been reported by Kuo et al. (2009) who found an indirect effect of mobile service quality on post-purchase intentions through customer satisfaction. Whilst examining mobile shopping experiences for physical products, Huang et al. (2015) found only the M-S-QUAL dimensions of fulfilment and responsiveness to have significant effects on loyalty. It is therefore of great interest to further research in a mobile shopping context the relationships among service quality, satisfaction and loyalty. Consequently, the following hypotheses are put forward:

H2: MS-SQ will have a positive impact on customer loyalty.

H2a: The dimensions of MS-SQ will have a positive impact on customer loyalty.

H3: Mobile customer satisfaction will have a positive impact on customer loyalty.

2.2.1. Control variables

To assess the research model, the study incorporates five descriptive statistical measures (gender, age, income, value of the clothing item purchased and m-shopping experience) as control variables, which might have significant influence on evaluations of MS-SQ, customers' satisfaction and loyalty evaluations. Younger customers have higher usage of mobile devices and are more likely to shop clothing via a mobile device than older customers (Herhausen et al., 2019). While Tupikovskaja-Omovie and Tyler (2020) report no gender differences in fashion shopping via mobile devices, female and male customers react differently to new technology adoption and in forming customer loyalty (Lee, 2011). Customers with higher income are less price sensitive (Herhausen et al., 2019), are more likely to regularly mobile shop clothing but show also less risk or uncertainty concerns (Chi, 2018). In addition, we control for the monetary value of the clothing item purchased as mobile shopping experiences might differ when purchasing lower value (e.g. t-shirt) and higher value (e.g. jacket) clothing items (Holmes et al., 2014). When customers shop clothing more often on their mobiles, they become more experienced and knowledgeable with the mobile shopping channel which results in favourable and positive evaluations of MS-SQ (Fang, 2019; Herhausen et al., 2019).

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In sum, our study employs the M-S-Qual of Huang et al. (2015) to assess shopping experiences of customers purchasing clothing items via their mobile phones. We propose that the original dimensions (efficiency, content, fulfilment, contact and responsiveness) of the M-S-Qual scale for physical products are relevant to customers evaluating their mobile shopping experiences. In turn, we suggest that mobile service quality perceptions lead to increased satisfaction. Because m-commerce retailers rely on repeat purchases, we assume the M-S-Qual dimensions will impact not only satisfaction but also directly loyalty. Hence, our study extends the work of Huang et al. (2015) by integrating the three aforementioned constructs in a conceptual model and exploring their relationships.

3. Research methodology

3.1. Study context

We chose the UK, which is a global leader in mobile technologies and m-commerce (Statista, 2019) and fashion clothing, as the context of our research investigation. The UK e-commerce and m-commerce market is one of the largest in the world with consumers increasingly buying fashion items through mobile devices. This provides opportunities to research and access respondents; to assess current customer experiences with regards to m-shopping, m-shopping service quality, satisfaction and loyalty. In particular, the UK is the largest m-commerce market in Europe (CRR, 2019), and according to eMarketer (2019a; 2019b) the UK is the third largest ecommerce market in the world with m-commerce accounting for 58.9% which is predicted to reach 71.2% of ecommerce sales by 2023. In addition, clothing has become the most mobile purchased product category in the UK driven by social media connections, convenience, 'flash sales and impulse buying' (Criteo, 2016).

3.2. Study 1: Measurement scale and data collection

Due to the nature of this empirical investigation, the study relied on quantitative research methods. This involved the development of a questionnaire by adapting and modifying existing measurement items which were tested and validated in previous research (Table 1). Specifically, items for the MS-SQ battery were borrowed from Huang et al. (2015) and Parasuraman et al. (2005). However, the dimension content, which was removed in Huang et al. (2015) following their exploratory factor analysis (EFA) and confirmatory factor analysis (CFA), was included in the scale for exploration purposes. Some authors suggest that the actual content on the website is important as some mobile websites do not have the same level of quality as their regular websites (Wang and Liao, 2007; Kuo et al., 2009). The satisfaction scale was constructed with reference to Cronin et al. (2000) and Deng et al. (2010), while the loyalty scale is founded on the studies by Santouridis and Trivellas (2010) and, Aydin and Ozer (2005). For all items, a seven-point Likert scale was utilised which offers sufficient natural choices to respondents and decent outcomes in test-retest reliability, concurrent validity, and predictive validity (Cox, 1980).

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The questionnaire was pilot-tested by five postgraduate students and received valuable feedback for the development of the final draft. Subsequently, data were collected through self-administered and online questionnaires which were optimised for viewing on mobile devices and desktop and laptop computers. Hence, respondents completed the questionnaire using their preferred device. According to Haan et al. (2019), most online surveys are now mixed-device surveys but respondents are increasingly using their smartphones and tablets to

participate in online surveys. In study 1, marketing students studying at one university in the Midlands UK who had bought clothing through mobile devices were invited to participate by email or approached in person, but no incentives were offered. University students were targeted as they are heavy users of smartphones whilst almost half of the segment of 18-34 years old had purchased clothes via the mobile devises (eMarketer, 2016a; Mintel, 2014). Student samples have been utilised in past studies examining conceptual models with focus on digital marketing (Ho and Dempsey, 2010; Mahapatra, 2017). For example, investigating mobile touch screens Cano et al. (2017) used a student sample to test the influence of image interactivity on engagement. This procedure resulted in gathering a convenience sample of one hundred usable questionnaires which was adequate for analytical purposes (Biscaia et al., 2017) and compares favourably to the sample of ninety respondents used in Huang et al. (2015) to test the physical product shopping M-S-QUAL scale. The study sample was comprised of 61 females and 39 males with the majority of students (97%) belonging in the 18-24 and 25-34 age groups.

4. Study 1: Data analysis and results

4.1. Measurement model

The study used SPSS and AMOS 26 software to analyse data and perform confirmatory factor analysis (CFA) and structural equation modelling (SEM). There is compelling empirical and theoretical evidence in the extant literature that service quality is best conceptualised as a second or higher order construct (Parasuraman et al., 1988; Brady and Cronin, 2001; Nunkoo et al., 2017). Because MS-SQ is described meaningfully by a higher-order structure, the most appropriate procedure to best capture such structures is a second-order factor approach (Koufteros et al., 2009; Nunkoo et al., 2017).

Hence, the MS-SQ factor structure was tested and verified by first and second order confirmatory factor analyses. This was necessary to confirm the MS-SQ dimensions but also to assess the measurement model before examining the structural relationships (Anderson and Gerbing, 1988). Four factors of MS-SQ were identified through CFA: efficiency, fulfilment, responsiveness and contact (Table 2). Goodness-of-fit statistics indicated that the confirmatory factor models adequately reflected a good fit for the data (Table 2). CFA results also supported the measurement model that included all the constructs i.e. 2nd order MS-SQ, satisfaction and loyalty (Table 2).

4.2. Reliability and validity

Composite reliability, Cronbach's alpha values, factor loadings, AVE scores showed that the measurement scale exhibits decent properties of reliability and validity. Specifically, all factor loadings exceeded the critical value of 0.5 and were statistically significant ($p<0.001$) while composite reliability and Cronbach's alpha values were above the threshold of 0.70, and the average variance extracted (AVE) reached or surpassed the critical value of 0.5. Hence, these analytical procedures provided strong signs of reliability and convergent validity (Hair et al., 2010; Anderson and Gerbing, 1988). Regarding discriminant validity (Table 3), the square root of the AVE for each factor/construct exceeded the correlations between any two factors/constructs in the 1st and 2nd order measurement models, except in the cases of EFF and MS-SQ (Fornell and Larcker, 1981). However, no substantial cross-loadings among factors/constructs were noted (Hair et al, 2010), and given the overall model fit, the CFA results indicate the measurement models possess good discriminant validity and was suitable for performing further SEM analyses.

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4.3. Structural model

This study used SEM and utilised the bootstrap resampling method along with 95% bias-corrected confidence intervals to test the hypotheses and mediation effects (Zhao et al., 2010; Hayes, 2009). Hence, the significance of the paths coefficients was assessed by a bootstrapping procedure of 2000 resamples using the replacement method and 100 observations per subsample. Specifically, two SEM models were tested. The first SEM analysis, which obtained an acceptable model fit (χ^2=477.210; χ^2(df)=1.663; IFI=0.907; CFI=0.905; TLI=0.892; RMSEA=0.082), showed that MS-SQ is a significant predictor of mobile customer satisfaction (β=0.817, p<0.01) (Table 4). Unexpectedly, MS-SQ has no significant direct impact on mobile customer loyalty (β=0.214, p>0.05). Customer satisfaction was found to significantly predict loyalty (β=0.572, p<0.05). Performing mediation analysis (Zhao et al., 2010; Hayes, 2009), there was a significant indirect effect of MS-SQ on loyalty through satisfaction (β=0.467, p<0.05, CI=0.055 to 0.803), which suggests that the relationship between MS-SQ and loyalty is fully mediated by customer satisfaction. Therefore, the analysis supports H1 and H3, but not H2 (Figure 2).

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However, when the aim is to obtain a detailed assessment of the potential impact of individual first-order MS-SQ factors on customer satisfaction and loyalty (i.e. testing H1a and H2a), the second-order SEM model does not permit such examination (Nunkoo et al., 2017; Huang et al., 2015; Özer et al., 2013; Shin, 2015; Zhao et al., 2012; Deng et al., 2010). Hence, the second SEM analysis was carried out to assess the impact of the MS-SQ dimensions on customer satisfaction and loyalty (Figure 3). The goodness-of-fit diagnostics suggested that the SEM model provides an acceptable overall fit for the data (χ^2=453.785; χ^2(df)=1.626; CFI=0.913; TLI=0.900; IFI=0.914; RMSEA=0.080). The results suggest that only the dimensions efficiency (β=0.408, p<0.05) and contact (β=0.305, p<0.01) are significant predictors of mobile customer satisfaction (Table 5). Surprisingly, responsiveness and fulfilment did not have a significant impact on customer satisfaction. Customer satisfaction predicts customer loyalty (β=0.726, p<0.01). Further mediation tests using bootstrapping procedures (Zhao et al., 2010; Hayes, 2009) showed significant indirect effects of the MS-SQ dimensions efficiency and contact on loyalty via satisfaction (Table 6). Therefore, the results offer some support for H1a and H3, but not H2a (Table 7).

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5. Study 2: consumer sample

5.1. Data collection

The purpose of study 2 was to conduct further tests and confirm the stability of the conceptual model using this time a consumer sample. In doing so, we used the online platform Amazon Mechanical Turk (MTurk) which has been increasingly employed by researchers to gain access to national and reliable samples with diverse socio-demographic characteristics (Park et al., 2021). We instructed MTurk to target only UK consumers who had purchased clothing items in the last six months to participate in the research. The survey yielded a sample of 167 responses. However, seventeen questionnaires were removed due to incomplete responses or missing data. Descriptive statistics showed that respondents were 46.7% females and 52% males. With regards to age, 18% belonged to the 18-25 age group, 40% were between 26 and 35 years of age, and 32% were between 36 and 45 years of age. As for their education, 46% had a Bachelor's degree and 23% had a Master's degree. Over half of the respondents were in full time employment (56.7%) and 14.7% were in part time employment whilst 17.3% had monthly income between £501 and £1000, 39.3% earned between £1001 and £2000, and 18.7% registered an income between £2001 and £3000. An overwhelming majority of respondents (76%) had m-shopping experience more than three

years. In the last six months, 22.7% bought clothing once or twice on mobile devices, 37.3% three or four times, 14.7% five or six times and 25.3% more than six times. With regards to the number of clothing items respondent purchased in the last six months on their mobile devices, 50.7% bought one or two clothing items while 30.7% bought 3 to 4 clothing items. In addition, we gathered data on clothing spending; 20% of respondents placed an order between £11 and £30, 34% between £31-£50, 22% between £51-£70, and 17.3% spent more than £90. Furthermore, 51.3% of respondents indicated that the most expensive clothing item in their last order was less than £30, while for 38% respondents this was between £31 and £60. Finally, 90% used their smartphone to shop for clothing items (Table 8).

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6. Study 2: data analysis and results

6.1. Measurement model, reliability and validity

Following the analytical procedure employed in study 1, we obtained the same first and second order factor structures using this time the consumer sample. CFA results confirmed the four MS-SQ dimensions: efficiency, fulfilment, responsiveness and contact (Table 9). Based on the goodness-of-fit statistics, the confirmatory factor models adequately reflected a good fit for the data (Table 9). CFA also supported the measurement model that included all the constructs i.e. 2nd order MS-SQ, satisfaction and loyalty (Table 9).

In a similar fashion with study 1, the reliability and validity of the measurement models were established by using composite reliability, Cronbach's alpha values, factor loadings and AVE scores. First, all factor loadings exceeded the critical value of 0.5 and were statistically significant ($p<0.001$). Second, composite reliability and Cronbach's alpha values were above

the threshold of 0.70, and the average variance extracted (AVE) reached or surpassed the critical value of 0.5, except for the factor fulfilment which was 0.483. Altogether, these measures support the reliability and convergent validity of the measurement scales. Third, the square root of the AVE for each factor exceeded the correlations between any two factors in, except in the case of FUL (Fornell and Larcker, 1981). However, no substantial cross-loadings among factors were noted (Hair et al, 2010), and given the overall model fit, the CFA results indicate the measurement models possess good discriminant validity (Table 10).

6.4. Structural model

In study 2, we test the hypotheses and mediation effects adding five key control variables to the models: gender, age, income, 'highest value clothing item purchased in last order' (HVCIP) and 'times clothing purchased on mobile device in the last six months' (TCPoMD). We assume that customers perceptions of MS-SQ might differ when purchasing low or more expensive clothing items as well as having previous experience of buying clothes on mobile devices.

Similar to study 1, two SEM models were tested utilising the bootstrap resampling method along with 95% bias-corrected confidence intervals (2000 resamples using the replacement method and 150 observations per subsample). The first SEM analysis, which obtained an acceptable model fit ($\chi 2$= 640.069; $\chi 2$(df)= 1.596; IFI=0.940; TLI=0.929; CFI=0.939, RMSEA=0.063), showed that MS-SQ is a significant predictor of mobile customer satisfaction (β=0.920, $p<0.01$) (Table 4). Because MS-SQ has no significant direct impact on mobile customer loyalty, the path was removed from the model. Customer satisfaction was found to significantly predict loyalty (β=0.952, $p<0.001$). Performing mediation analysis (Zhao et al., 2010; Hayes, 2009), there was a significant indirect effect of MS-SQ on loyalty through satisfaction (β=0.876, $p<0.01$, CI=0.715 to 0.983), which suggests

that the relationship between MS-SQ and loyalty is fully mediated by customer satisfaction. Of the control variables, only TCPoMD had an impact on satisfaction. Therefore, the analysis supports H1 and H3, but not H2 (Figure 4).

Further SEM analysis controlling for gender, age, income, HVCIP and TCPoMD and demonstrating acceptable model fit ($\chi 2$=593.096; $\chi 2$(df)= 1.557; IFI=0.947; TLI=0.934; CFI=0.946, RMSEA=0.061) revealed that only the dimension efficiency (β=0.617, $p<0.01$) is a significant predictor of mobile customer satisfaction (Table 5), whilst responsiveness, fulfilment and contact did not have a significant impact on customer satisfaction. Customer satisfaction predicts customer loyalty (β=0.950, $p<0.01$). Further mediation tests using bootstrapping procedures (Zhao et al., 2010; Hayes, 2009) showed significant indirect effects of the MS-SQ dimensions efficiency on loyalty via satisfaction (Table 6). Of the control variables, only TCPoMD had an impact on satisfaction. Therefore, the results offer some support for H1a and H3, but not H2a (Table 7).

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7. Discussion

7.1 Theoretical implications

The present paper contributes to marketing and mobile shopping literature by examining the dimensions of MS-SQ and their impact on customer satisfaction and loyalty using student and consumer samples. Our findings are robust and support the stability of the conceptual model in both studies. Huang et al. (2015) has mentioned that physical goods shopping experiences have been almost neglected in research regarding mobile devices urging researchers to validate the M-S-QUAL scale in other mobile shopping contexts. Our results in both studies suggest that the dimensions efficiency, fulfilment, contact and responsiveness constitute M-S-QUAL in physical product shopping experiences, thus empirically supporting the findings of Huang et al. (2015). It appears that the measurement scale of MS-SQ regarding physical product mobile shopping exhibit acceptable psychometric properties in terms of reliability and validity. As evidenced in both studies, efficiency is the dimension with the greatest importance, users want to be able to get to any place on the mobile site as quickly as possible, by also accessing the greatest level of information in the easiest way possible. Interestingly, as in the study of Huang et al. (2015), the analysis revealed that content is not a dimension of MS-SQ. It may be the case that content is an element that is a requirement to be present on mobile sites. If a mobile shopping site does not exhibit adequate and relevant content, the site will simply not be able to compete within the marketplace (Huang et al., 2015).

Based on our empirical evidence, we observed that MS-SQ strongly impacts customer satisfaction, which subsequently impacts loyalty, thus supporting hypotheses **H1** and **H3**. Customer satisfaction completely mediates the link between MS-SQ and loyalty. This suggests that customers may perceive high service quality with the mobile shopping site but will only continue to shop from the same mobile retailer when they are satisfied.

The dimensions efficiency and contact were strong predictors of customer satisfaction in study 1, while only the dimension efficiency predicted customer satisfaction in study 2, partially supporting **H1a**. Efficiency of the mobile shopping site refers to how well the website is designed, allowing the users to navigate quickly and easily find what they are looking for. This is consistent with past research on online shopping which have confirmed the positive effect of website design on satisfaction (Kim et al., 2009; Chung and Shin, 2010). The results do not support **H2 and H2a** as it seems that MS-SQ has no direct impact on loyalty. This finding is robust across the data samples. However, the dimensions efficiency and contact have indirect effects on loyalty via customer satisfaction in study 1, which fully mediates the association between service quality and loyalty in line with previous studies (Kuo et al., 2009; Deng et al., 2010; Shin, 2015). In study 2, only efficiency had indirect effect on loyalty via customer satisfaction. Although Huang et al. (2015) did not study the impact of the M-S-QUAL dimensions on other constructs in a conceptual model, they reported insignificant direct effects of the dimensions efficiency and contact on loyalty intention when testing for criterion validity. Unlike Huang et al. (2015), this study did not support the direct impact of the fulfilment and responsiveness dimensions on loyalty. The finding that H2 and H2a was not supported can possibly be reasoned by the fact that mobile shopping can entail pleasure and enjoyment, and become a channel of "leisure shopping" for customers at times (Bäckström, 2011). This simply means that there are consumers who visit mobile shopping sites for simply catching up with new product releases, browsing product catalogues, when filling time at home, or creating a virtual shopping basket (Fuentes and Svingstedt, 2017).

Findings indicate that mobile customer satisfaction has a positive impact on customer loyalty in both studies. The satisfaction-loyalty link has previously been confirmed in consumer behaviour research over a wide range of services and product contexts. For

example, past research has found that customer satisfaction affects loyalty towards mobile commerce (Lin and Wang, 2006), mobile banking (Thakur, 2014), or mobile payment services (Zhou, 2013). Similar results from previous research indicate that customers' satisfaction with mobile shopping increases their loyalty (Groβ, 2018), and prevents them from regularly switching to other shopping channels (Hure et al., 2017). This is further strengthened by the fact that satisfied with mobile shopping applications customers, have a higher intention for reusing the mobile shopping tool again (Natarajan et al., 2018). Our findings in the mobile shopping context further demonstrates the existence of this association, confirming that monitoring and improving users' satisfaction with mobile shopping is an appropriate approach for mobile retailers to retain customers.

7.2. Managerial Implications

The findings have important implications for practice. The online marketplace is extremely competitive within the fashion clothing industry and the popularity of mobile commerce is adding an extra layer of complexity, but also opportunities for retailers. The efficiency of a mobile shopping site could be increased by embedding Augmented Reality (AR) features. AR technology is perceived as easy to use, enjoyable and useful, whilst recent research evidence shows that it provides interesting stimuli that influences the consumers' cognitive processing, and can positively influence brand engagement, brand usage intention and satisfaction (McLean and Wilson, 2019; Tupikovskaja-Omovie and Tyler, 2020). Customers often try to visualise the use of a product to understand its applicability before purchase (McLean and Wilson, 2019). AR features can provide customers with a clear, vibrant and detailed representation of the product in the real world. Retailers and popular brands such as Adidas, ASOS, L'Oreal, Nike, Sephora and Mini have already implemented augmented reality to provide a more realistic experience of their products and aid consumer during decision

making (Heller et al., 2019; McLean and Wilson, 2019). Managers should ensure that mobile site developers add AR features when developing mobile sites to improve the efficiency of the shopping experience. With AR functionality embedded in a mobile site, consumers will no longer have to imagine what the product looks like, instead they will be provided with a clear and detailed representation of the image with minimal difficulty or effort. AR experience enable consumers to see products through a combination of the virtual and real world, rather than leaving them to rely on mental imagery that reflects products. AR could be very effective in the fashion industry, where shoppers could stand in front of their cameras and see the clothes they want to try with AR on them. By taking a selfie, they can look at the outfit they want to try. Furthermore, virtual boutiques and virtual trial rooms can further enhance the AR experience. By visualising the virtual shelves where the virtual shoes, accessories and clothes are located, shoppers can try the product they want on the selfie. Augmented reality has also the potential to change the process of information searching (Javornik, 2016). Mobile shopping sites could benefit by the introduction of a "search by image" feature that will enable consumer to take a photo of a product on their smartphone and use the photo to search for a specific product. Once the product is found within the mobile site, it could then be placed into a real-world view.

In addition, to create better mobile shopping customer experiences and loyalty, mobile shopping sites could utilise voice search (e.g. ASOS Enki on Google Assistant), artificial intelligence (AI) voice assistants to allow customers to search and purchase products with a simple voice command. Mobile shopping sites could also introduce features that allow for greater personalised and efficient experiences (Tupikovskaja-Omovie and Tyler, 2020). An example of this is ASOS AI-driven Fit Assistant which provides size recommendations and help customers to select the right product.

Efficiency of the mobile site was found as having a positive impact on perceptions of mobile service quality, satisfaction and loyalty. In an attempt to improve the mobile shopping experience, managers should ensure that mobile site users are able to easily share their experiences and the products they purchased with their peers on social media (Bugshan and Attar, 2020). This will enable other social media users to access the page with the product they are interested in (the "landing page") without getting lost on the website. Landing pages have been recognised as an essential element in online marketing, as they tend to make users prone to act (Pelet and Papadopoulou, 2015). This is further enhanced on a mobile site, since consumers are able to take decisions instantly, due to the ease-of-use of the landing page, and its responsive design (Pelet and Papadopoulou, 2015). In this way, a brand can receive recognition and drive traffic to the m-commerce website, whilst increasing exposure and followers of its social media account through its m-commerce website.

The global Covid-19 pandemic has made it clear that businesses need fast and efficient ways to serve and communicate with their customers. As many consumers are avoiding physical stores during the Covid-19 pandemic, retailers need ways to stay in touch with their customers through their smartphones. WhatsApp plans to start offering in-app shopping features to help small retailers upgrade their e-commerce efforts (Facebook, 2020). Mobile shopping managers and developers should take advantage of this opportunity and integrate WhatsApp features into their m-commerce channels, to communicate with their customers. Recent evidence shows people prefer to message retailers to get help, and they are more likely to buy when they can do so (Facebook, 2020). Also, WhatsApp has started offering a "shopping catalogue feature", enabling businesses display a "mobile storefront" showcasing their products with images and prices (Reuters, 2019). This can be of particular interest for fashion retailers, who will be able to showcase their products on mobile devices, something that could significantly increase the efficiency of the mobile shopping site.

Finally, the display and use of Social Messaging Apps such as Facebook Messenger, Snapchat, WhatsApp etc. could significantly enhance users' perceptions of the contact attribute and increase their satisfaction with the mobile shop. Mobile shopping sites could benefit from secure communication and instant messaging functions incorporating AI into interactions such as customer service chatbots or virtual agents (Chattaraman et al., 2012), to create humanlike communication experiences (Fang, 2019) and provide customers with better online assistance, and further enhance their satisfaction (Chung et al., 2020).

7.3. Limitations and future research directions

The present study makes empirical and managerial contributions to the mobile shopping literature. In particular, the paper found the M-S-QUAL scale of Huang et al. (2015) to be a valid instrument to assess MS-SQ and offered further insights into the mediating role of customer satisfaction between the relationship of MS-SQ and loyalty. However, as with any empirical study, this research has its limitations. First, the small samples might limit the generalisability of the findings despite its adequacy for analytical purposes and the bootstrapping procedures utilised. Second, the study focused on mobile clothing retailing and the findings may be specific to this particular industry. Third, the study used a mixed-device survey strategy and did not gather data on the type of device used by respondents to complete the questionnaire in order to test for this impact on responses. Fourth, the study was conducted in a single country, the UK which might limit the generalisability of the findings to other countries.

Therefore, future studies may aim to conduct research with larger national and international samples targeting other consumer profiles and mobile shoppers of other physical goods or services. In particular, comparative studies using consumer samples from multiple countries are welcomed. While the length of the questionnaire is typical in this kind of

studies, it is suggested that researchers create well-designed surveys for mobile devices allowing and encouraging mobile survey completion across population groups in order to avoid participant fatigue (Haan et al., 2019). Researchers may also include key marketing constructs such as customer engagement and experience in MS-SQ conceptual models and provide further insights on mobile shopping.

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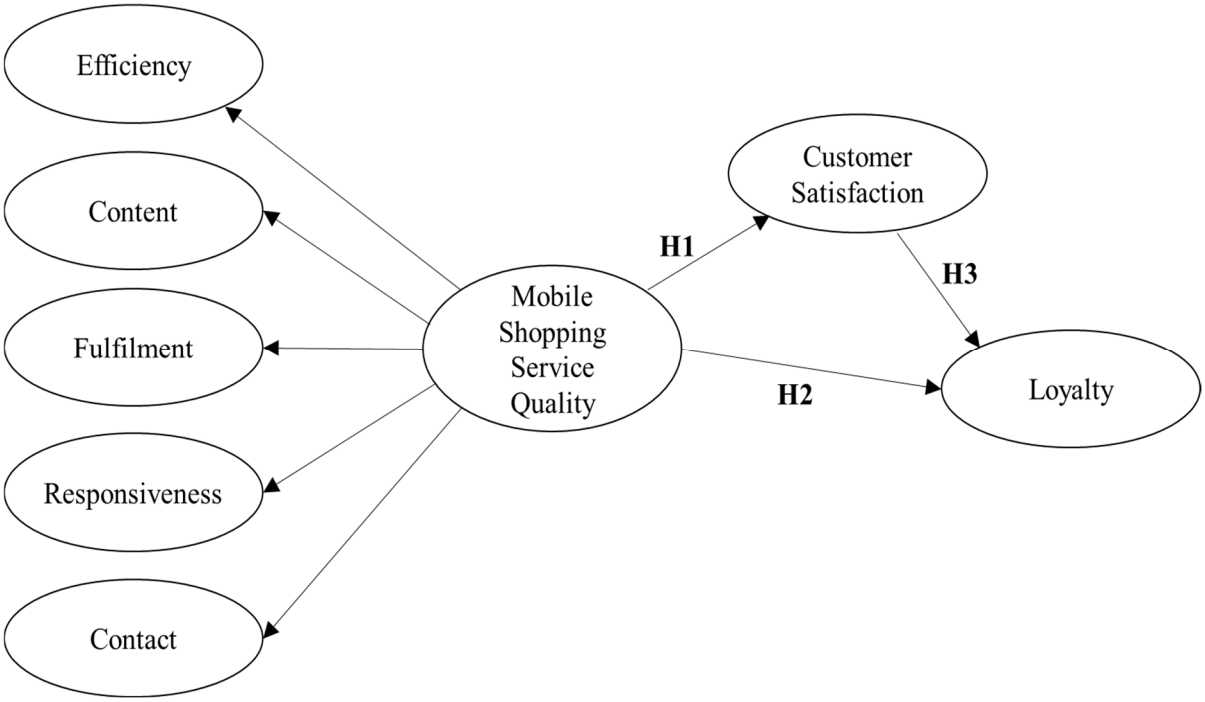

Figure 1: Conceptual model of MS-SQ, customer satisfaction and loyalty.

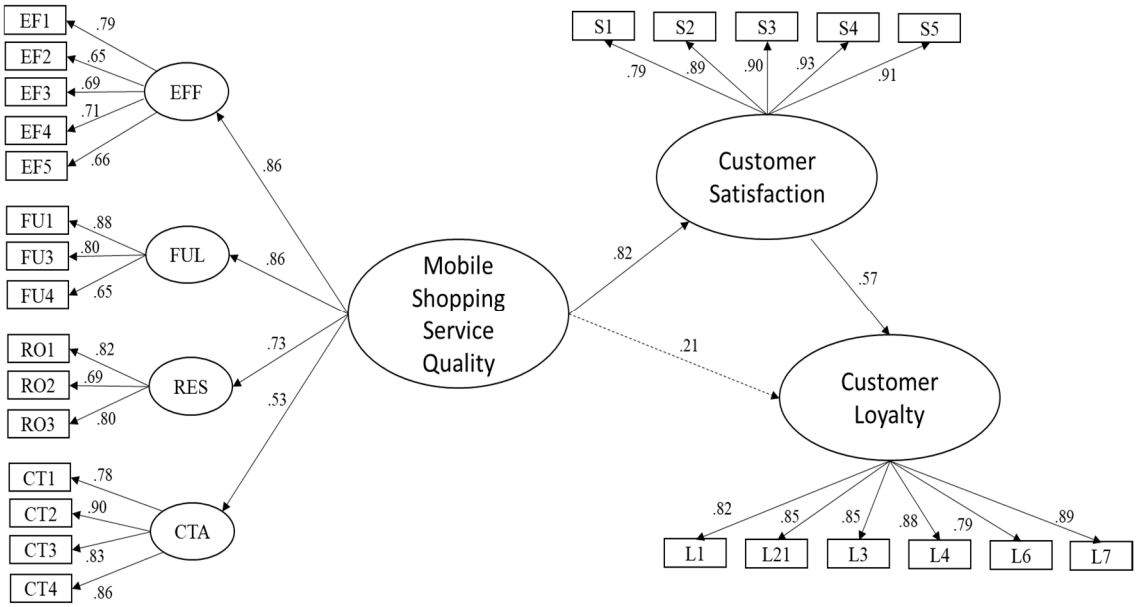

Figure 2: SEM results for Model 1, Study 1
Note: Dotted line indicates a non-significant path.

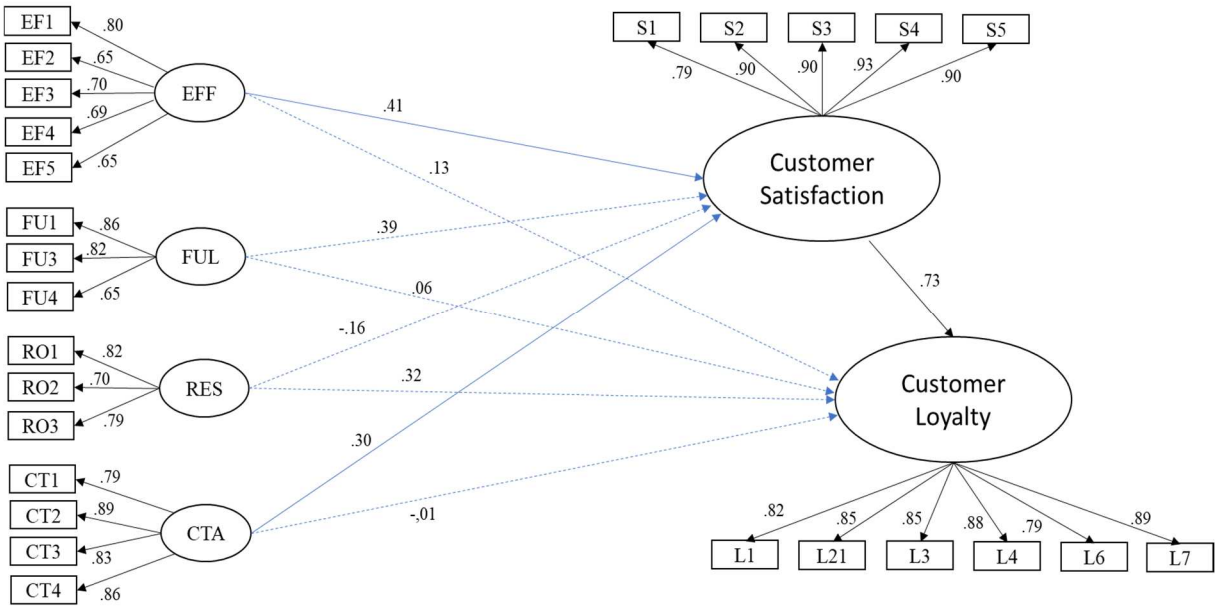

Figure 3: SEM results for Model 2, Study 1
Note: Dotted line indicates non-significant paths.

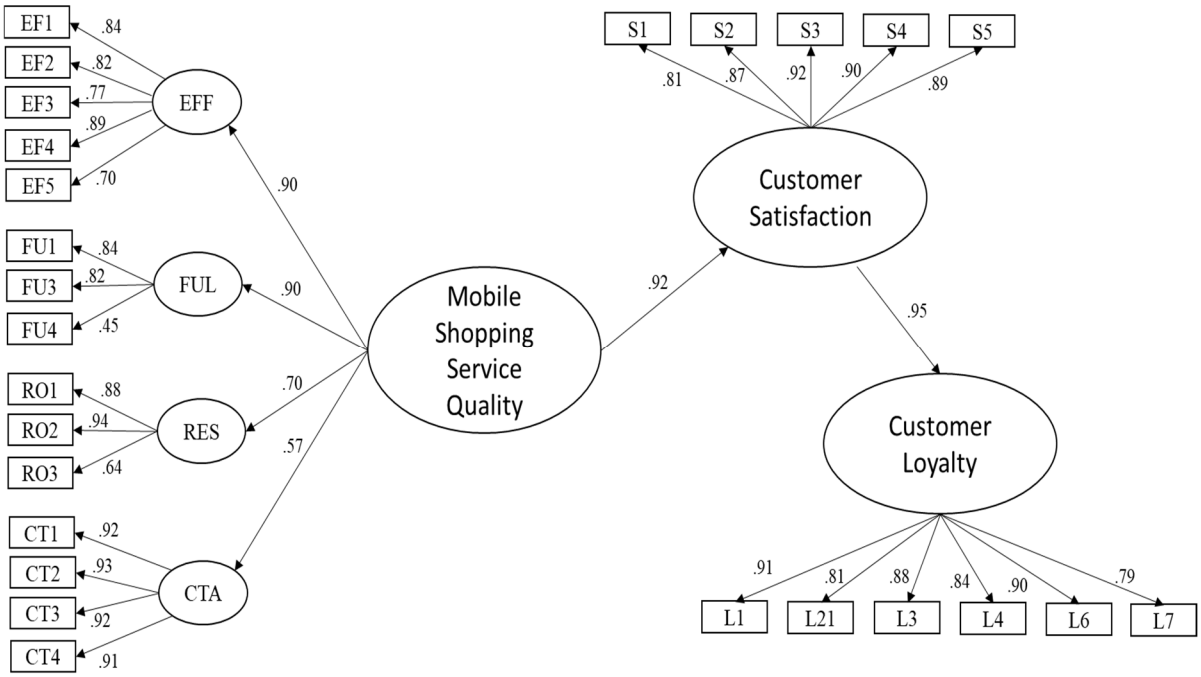

Figure 4: SEM results for Model 1, Study 2

Table 1: Measurement Scale and Sources

Construct/Factor	Definitions[1] and Items	Sources
Mobile Shopping Quality		Huang et al. (2015)
Efficiency:	*"Whether the site responds quickly and is easy to use"*	Parasuraman et al. (2005)
	EF1 The mobile site makes it easy to find what I am looking for	
	EF2 It is easy to navigate to any area of the mobile site	
	EF3 The mobile site enables me to complete transactions quickly	
	EF4 Information of the mobile site is laid out logically	
	EF5 The mobile site loads pages quickly	
Content:	*"Whether the information on the mobile site is appropriate and correct"*	
	CO1 The content of the mobile site is concise	
	CO2 The content of the mobile site is accurate	
	CO3 The mobile site contains all of the content as that on the regular site	
	CO4 The mobile site contains regularly updated content	
	CO5 The content provided is fully understandable	
Fulfilment:	*"The extent to which the site's promises about order delivery and item availability are fulfilled"*	
	FU1 The mobile site delivers the orders when they are promised	
	FU2 The mobile site suggests a time frame for when the item will be delivered	
	FU3 The mobile site sends out the correct items	
	FU4 The mobile site has accurate stock information and only shows what is available	
Responsiveness:	*"The effectiveness of the site's problem-handling process and return policy"*	
	RE1 The mobile site provides me with convenient options for returning the items	
	RE2 The mobile site has a clear process for handling returns	
	RE3 The mobile site offers a meaningful guarantee	
	RE4 There is information available of what to do if there is a problem	
	RE5 There is a telephone number available to reach the company	
	RE6 There is a dedicated online chat function on the mobile site	
Contact:	*"The availability of telephone assistance and online representatives"*	
	CC1 The service agents are friendly and willing to assist when receiving complaints	
	CC2 The service agents consistently provide useful advice	
	CC3 The service agents are polite and reassuring	
	CC4 The service agents are able to quickly resolve the problem	
Satisfaction	SAT1 My choice to purchase from the mobile site was wise	Cronin et al. (2000)
	SAT2 The mobile site has met my expectations	Deng et al. (2010)
	SAT3 I did the right thing by choosing this mobile site	
	SAT4 Overall, I was satisfied with the shopping experience on the mobile site	
	SAT5 The mobile site enabled a pleasant shopping experience	
Loyalty	LO1 I will continue to use the mobile site to shop for new clothing	Aydin and Ozer (2005)
	LO2 If I ever need to purchase new clothing, this mobile site would be my first choice	Santouridis and Trivellas (2010)
	LO3 I would recommend this mobile site to other people	
	LO4 I will encourage people to purchase clothing from this mobile site	
	LO5 Even if another mobile site offered something cheaper, I would still buy from this site	
	LO6 It is likely that I will use this mobile site again in the future	
	LO7 This mobile site will be my preference when I shop again	

Note: 1=Definitions adopted from Huang et al. (2015, p. 132).

Table 2: CFA Results Study 1

		1st Order			2nd Order CFA	2nd Order CFA		
Constructs - Items	**Cr a**	**FL**	**CR**	**AVE**	**FL**	**FL**	**CR**	**AVE**
MS-SQ: Efficiency					**0.837**	**0.859**	0.840	0.576
EF1	0.828	0.793	0.826	0.489	0.794	0.788		
EF2		0.639			0.646	0.655		
EF3		0.679			0.676	0.668		
EF4		0.709			0.710	0.711		
EF5		0.667			0.666	0.658		
MS-SQ: Fulfilment					**0.867**	**0.847**		
FU1	0.766	0.872	0.822	0.610	0.872	0.886		
FU3		0.804			0.796	0.797		
FU4		0.651			0.662	0.649		
MS-SQ: Responsiveness					**0.803**	**0.759**		
RO1	0.820	0.815	0.805	0.580	0.825	0.789		
RO2		0.685			0.653	0.697		
RO3		0.779			0.750	0.753		
MS-SQ: Contact					**0.486**	**0.523**		
CC1	0.896	0.792	0.908	0.713	0.777	0.768		
CC2		0.897			0.904	0.901		
CC3		0.821			0.818	0.818		
CC4		0.864			0.862	0.869		
Satisfaction							0.947	0.782
SAT1						0.788		
SAT2						0.891		
SAT3						0.901		
SAT4						0.929		
SAT5						0.906		
Loyalty							0.938	0.716
LO1						0.819		
LO2						0.849		
LO3						0.853		
LO4						0.882		
LO6						0.780		
LO7						0.890		
		χ^2=130.303 (p<0.001), χ2/df=1.589, GFI=0.854, NFI=0.853, IFI=0.940, TLI=0.921, CFI=0.938, RMSEA=0.077			χ^2=124.570 (p<0.001), χ2/df=1.501, GFI=0.853, NFI=0.859, IFI=0.948, TLI=0.933, CFI=0.947, RMSEA=0.071	χ^2=446.173 (p<0.001), χ2/df=1.571, NFI=0.808, IFI=0.920, TLI=0.907, CFI=0.919, RMSEA=0.076		

Note: All factor loadings are significant at p<0.001

Table 3: Correlations and Discriminant Validity Study1

1st Order MS-SQ Measurement Model				
	RES	**EFF**	**FUL**	**CCT**
RES	**0.762**			
EFF	0.636	**0.699**		
FUL	0.666	0.762	**0.781**	
CCT	0.521	0.368	0.346	**0.844**

Note: Significance level: p<0.001. Correlations are shown below diagonals in bold which represent the square root of AVE.

Table 4: Standardized Coefficients and Bias-Corrected Confidence Intervals for Model 1

			Study 1				Study 2			
Relationship			**Estimate**	**Lower**	**Upper**	**P**	**Estimate**	**Lower**	**Upper**	**P**
SAT	<---	MS-SQ	.817	.676	.909	.002	.920	.769	1.004	.004
EFF	<---	MS-SQ	.858	.689	.992	.001	.902	.765	.987	.003
FUL	<---	MS-SQ	.857	.704	.950	.002	.906	.761	1.046	.001
RES	<---	MS-SQ	.725	.522	.895	.001	.705	.552	.826	.001
CCT	<---	MS-SQ	.529	.232	.739	.002	.569	.411	.695	.001
LOYALTY	<---	SAT	.572	.049	.923	.037	.952	.896	.993	.001
LOYALTY	<---	MS-SQ	.214	-.134	.685	.240				
SAT	<---	Gender					.074	-.032	.209	.181
SAT	<---	Age					-.021	-.157	.104	.691
SAT	<---	Income					-.008	-.145	.134	.870
SAT	<---	HVCIP					.035	-.069	.156	.469
SAT	<---	TCPoMD					-.138	-.273	-.023	.020
LOYATLY	<---	Gender					-.012	-.092	.066	.744
LOYATLY	<---	Age					-.007	-.090	.072	.804
LOYATLY	<---	Income					.050	-.026	.129	.193
LOYATLY	<---	HVCIP					.030	-.038	.096	.403
LOYATLY	<---	TCPoMD					.016	-.065	.106	.662

HVCI=Highest Value Clothing Item Purchased; TPCoMD=Times Clothing Purchased on Mobile Device in Last Six Months

Table 5: Standardized Coefficients and Bias-Corrected Confidence Intervals for Model 2

			Study 1				Study 2			
Relationship			**Estimate**	**Lower**	**Upper**	**P**	**Estimate**	**Lower**	**Upper**	**p**
SAT	<---	EFF	.408	.000	.836	.050	.617	.406	.831	.005
SAT	<---	FUL	.393	-.066	.836	.075	.300	-.171	.602	.098
SAT	<---	CCT	.305	.007	.567	.044	.035	-.112	.251	.596
SAT	<---	RES	-.164	-.730	.183	.327	-.023	-.258	.167	.625
LOYALTY	<---	SAT	.726	.376	1.068	.008	.950	.899	.990	.001
LOYALTY	<---	RES	.321	-.232	.906	.221				
LOYALTY	<---	EFF	-.133	-.632	.281	.493				
LOYALTY	<---	FUL	-.057	-.580	.686	.899				
LOYALTY	<---	CCT	-.013	-.353	.312	1.000				
SAT	<---	Gender					.096	-.017	.225	.093
SAT	<---	Age					-.049	-.184	.076	.485
SAT	<---	Income					-.027	-.178	.103	.576
SAT	<---	HVCIP					.061	-.059	.195	.262
SAT	<---	TCPoMD					-.142	-.298	-.022	.019
LOYATLY	<---	Gender					-.015	-.098	.062	.660
LOYATLY	<---	Age					-.006	-.093	.070	.807
LOYATLY	<---	Income					.046	-.028	.123	.213
LOYATLY	<---	HVCIP					.036	-.030	.105	.271
LOYATLY	<---	TCPoMD					.015	-.064	.102	.658

HVCI=Highest Value Clothing Item Purchased; TCPoMD=Times Clothing Purchased on Mobile Device in Last Six Months

Table 6: Standardized Indirect Effects and Bias-Corrected Confidence Intervals for Model 2

	Study 1				Study 2			
Relationship	**Estimate**	**Lower**	**Upper**	**p**	**Estimate**	**Lower**	**Upper**	**p**
EFF→SAT→LOYALTY	.296	.021	.807	.035	.586	.389	.798	.004
FUL→SAT→LOYALTY	.286	-.054	.688	.081	.285	-.158	.568	.095
CCT→SAT→LOYALTY	.221	.011	.571	.040	.033	-.103	.238	.594
RES→SAT→LOYALTY	-.119	-.718	.123	.319	-.022	-.246	.154	.622

Table 7: Summary of Hypothesis Testing

Hypothesis	**Relationship**	**Decision**
H1	MS-SQ ---> Customer Satisfaction	Supported
H1a	The dimensions of MS-SQ ---> Customer Satisfaction	Partially Supported
H2	MS-SQ ---> Customer Loyalty	Not Supported
H2a	The dimensions of MS-SQ ---> Customer Loyalty	Not Supported
H3	Customer Satisfaction ---> Customer Loyalty	Supported

Table 8: Sample Demographics Study 2

Participants (N=150)		Frequency	Percent
Gender	Female	70	46.7
	Male	78	52.0
	Prefer not to say	2	1.3
Age	18 to 25	27	18.0
	26-35	60	40.0
	36-45	48	32.0
	46-55	8	5.3
	56-65	7	4.7
Education	Secondary School	7	4.7
	High School	29	19.3
	Bachelor's degree	69	46.0
	Master's degree	35	23.3
	PhD	5	3.3
	Others	5	3.3
Employment	Full time employment	85	56.7
	Part time employment	22	14.7
	Student	15	10.0
	Unemployed	18	12.0
	Retired	4	2.7
	Other	6	4.0
Monthly Income	less than £500	20	13.3
	£501 to £1000	26	17.3
	£1001 to £2000	59	39.3
	£2001 to £3000	28	18.7
	£3001 to £4000	11	7.3
	more than £4000	6	4.0
M-Shopping Experience	less than 12 months	6	4
	12-24 months	14	9.3
	25-36 months	16	10.7
	More than 3 years	114	76
M-Shopping: Times Clothing Purchased in Last Six Months	1-2	34	22.7
	3-4	56	37.3
	5-6	22	14.7
	More than 6	38	25.3
M-Shopping: # of Clothing Items Purchased in Last Six Months	1-2	76	50.7
	3-4	46	30.7
	5-6	12	8.0
	More than 6	16	10.7
M-Shopping: Amount Spent on Clothing in Last Order	less £10	3	2.0
	£11- £30	30	20.0
	£31-£50	51	34.0
	£51-£70	33	22.0
	£71-£90	7	4.7
	More than £90	26	17.3
M-Shopping: Most Expensive Clothing Item in Last Order	<= £30	77	51.3
	£31 - £60	57	38.0
	£61+	16	10.7
M-Shopping: Device Used	Smartphone	135	90
	Tablet	15	10

Table 9: CFA Results, Study 2

		1st Order			2nd Order CFA	2nd Order CFA		
Constructs - Items	**Cr a**	**FL**	**CR**	**AVE**	**FL**	**FL**	**CR**	**AVE**
MS-SQ: Efficiency	**0.904**				**0.843**	**0.888**	0.860	0.614
EF1		0.832	0.901	0.647	0.836	0.829		
EF2		0.803			0.812	0.819		
EF3		0.773			0.769	0.765		
EF4		0.891			0.895	0.895		
EF5		0.712			0.699	0.705		
MS-SQ: Fulfilment	**0.664**				**0.876**	**0.914**		
FU1		0.703	0.731	0.483	0.691	0.658		
FU3		0.821			0.747	0.808		
FU4		0.529			0.504	0.449		
MS-SQ: Responsiveness	**0.854**				**0.873**	**0.703**		
RO1		0.747	0.807	0.583	0.780	0.878		
RO2		0.798			0.831	0.941		
RO3		0.744			0.714	0.641		
MS-SQ: Contact	**0.957**				**0.641**	**0.580**		
CC1		0.920	0.957	0.847	0.920	0.920		
CC2		0.930			0.930	0.930		
CC3		0.922			0.923	0.924		
CC4		0.910			0.908	0.908		
Satisfaction							0.942	0.765
SAT1						0.804		
SAT2						0.864		
SAT3						0.912		
SAT4						0.902		
SAT5						0.888		
Loyalty							0.943	0.734
LO1						0.912		
LO2						0.809		
LO3						0.872		
LO4						0.836		
LO6						0.906		
LO7						0.797		
		χ^2=129.392 (p<0.01), χ^2/df=1.578, GFI=0.898, NFI=0.929, IFI=0.973, TLI=0.965, CFI=0.973, RMSEA=0.062			χ^2=153.258 (p<0.001), χ^2/df=1.825, GFI=0.879, NFI=0.916, IFI=0.960, TLI=0.949, CFI=0.960, RMSEA=0.074	χ^2=515.208 (p<0.001), χ^2/df=1.808, NFI=0.877, IFI=0.941, TLI=0.932, CFI=0.940, RMSEA=0.074		

Note: All factor loadings are significant at p<0.001. Cr a = Cronbach alpha

Table 10: Correlations and Discriminant Validity Study 2

1st Order MS-SQ Measurement Model				
	RES	**EFF**	**FUL**	**CCT**
RES	**0.763**			
EFF	0.705	**0.804**		
FUL	0.666	0.792	**0.695**	
CCT	0.701	0.505	0.318	**0.921**

Note: Significance level: p<0.001. Correlations are shown below diagonals in bold which represent the square root of AVE.