

MASTER
MARKETING

MASTER'S FINAL WORK
DISSERTATION

THE EFFECT OF PROMOTIONAL PUSH NOTIFICATIONS
FROM SUPERMARKET BRANDED APPS ON PURCHASE
BEHAVIOR

ROMULO ZARELLI COSTACURTA

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SUPERVISION:
PROF. PAULO JORGE DE ALMEIDA GONÇALVES

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Abstract

The mobile adoption in the world saw an exponential increase in the past years, which also reflected on the numbers mobile applications, or apps, available for download on all mobile operating systems. Following this growth, many companies developed their own apps to display their brand entities, to get financial and cognitive brand responses. As an evolution, companies started to use their branded apps as a channel of direct marketing with push notifications, displaying short messages on the mobile device's screen to draw the attention of the customer.

Therefore, the present research seeks to understand the dimension of the impact on purchase behavior of push notifications sent by branded apps of Portuguese Supermarkets chains. Specifically, this research seeks to measure the frequency of purchases, recency of the last purchase, and the monetary value expended on purchases, when comparing recipients and not recipients of push notifications. Moreover, since customers assess several costs and benefits before purchase, this research aims, in a preliminary attempt, to segment the results by the different groups of shoppers based on psychographic variables.

This explanatory research was conducted by adopting a quantitative approach and non-probability sampling. With an online questionnaire, all data was collected from 265 internet users, which was then treated using statistical procedures, such as descriptive, multivariate and cluster analysis.

The findings confirm that customers who received push notifications from a supermarket branded app have a higher average on the monthly expenses on supermarket when compared to customers who have branded apps but did not receive any push notification. However, these results were observed only for two of three clusters created: the shoppers deeply involved on all attributes of the purchase and the shoppers with a higher concern regarding the products.

Academically, this dissertation contributes to the discussion regarding push notifications from mobile apps as a direct marketing channel and on the effects of customer characteristics on the results of direct marketing communications. This investigation also offers insights for marketing practitioners by acknowledging that push notifications could be used to drive and increase user's offline purchases.

Keywords: mobile, branded apps, push notification, direct marketing, mobile marketing.

Resumo

A adoção de dispositivos móveis no mundo presenciou um aumento exponencial nos últimos anos, o que também se refletiu no número de aplicações móveis, ou *apps*, disponíveis para descarga em todos os sistemas operacionais móveis. Com este crescimento, muitas empresas desenvolveram suas próprias *apps* para exibir suas entidades de marca e obter respostas financeiras e cognitivas para as marcas. Como uma evolução, as empresas começaram a usar suas aplicações como um canal de marketing direto com notificações *push*, mensagens curtas no ecrã do dispositivo móvel para chamar a atenção do cliente.

Portanto, a presente pesquisa procura compreender a dimensão do impacto no comportamento de compra das notificações *push* enviadas por aplicações de marca das redes de supermercados portuguesas. Especificamente, esta pesquisa procura medir a frequência das compras, a recorrência da última compra e o valor monetário gasto nas compras. Além disso, como os clientes avaliam vários custos e benefícios antes da compra, esta pesquisa visa, de forma preliminar, segmentar os resultados para diferentes grupos de compradores com base em variáveis psicográficas.

Esta pesquisa explicativa foi realizada adotando-se uma abordagem quantitativa e amostragem não probabilística. Com um questionário *online*, todos os dados foram coletados de 265 respondentes, que foram tratados com procedimentos estatísticos, como análise descritiva, multivariada e de *cluster*.

As descobertas confirmam que os clientes que receberam notificações *push* de aplicações com a marca de supermercados têm uma média superior nos gastos mensais nos supermercados, em comparação com os clientes com aplicativos de marca que não receberam nenhuma notificação *push*. Entretanto, esses resultados foram observados apenas em dois dos três grupos criados: os compradores envolvidos profundamente em todos os atributos da compra e os compradores com uma maior preocupação com os produtos.

Academicamente, esta dissertação contribui para a discussão sobre notificações *push* de aplicações móveis como um canal de marketing direto e sobre os efeitos das características do cliente no efeito destas campanhas de marketing direto. Essa investigação também oferece informações para o profissional de marketing, afirmando que as notificações por *push* podem ser usadas para impulsionar e aumentar as compras *offline* dos usuários.

Palavras-chave: telemóveis, aplicações de marca, notificação *push*, marketing direto, marketing mobile.

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1. INTRODUCTION

1.1. Background

Mobile adoption is truly ubiquitous (Shankar *et al.*, 2010). By the end of 2018, according to GSMA (2019), 5.1 billion people around the world were subscribed to a mobile service, accounting for 67% of the global population, with one billion new subscribers been added since 2013. An expected average annual growth rate of 1.9% between 2018 and 2025 will bring the total number of mobile subscribers to 5.8 billion (71% of the population). Regarding the mobile devices, also according to GSMA (2019), they account in 2018 for over 5 billion internet connections, representing 60% of all the internet connections and it is expected by 2025 to account for 7 billion connections, what would represent 80% of all internet connections.

The increase of mobile adoption is also seen in Portugal, where 99.8% of the population are covered by mobile telecommunications networks (INE, 2018a) and 93.4% of Portuguese households have at least one mobile phone (Pordata, 2018a), with mobile holding a share of 83.8% of all the telephone traffic (Pordata, 2018b). The usage of internet in mobile devices had also seen an exponential increase in Portugal, from 42.17 petabytes (equivalent to 42 million gigabytes) of data traffic in mobile service in 2013 to 198.38 petabytes in 2017 (INE, 2018b).

This growth also reflects on the numbers mobile applications, or apps (software downloadable to a mobile device), which are becoming ubiquitous on all mobile operating systems and encourage users to spend an increasing amount of time on their phones (Alnawas & Aburub, 2016). By the end of 2018, there were over four million apps available for download (Statista, 2018b), with 205.4 billion apps downloads into mobile devices worldwide in 2018 (Statista, 2018a).

All these indicators of growth in markets for mobile devices and apps enabled an increasing importance in the business landscape of mobile marketing, the set of marketing initiatives that use mobile devices as the vehicles of communication (Shankar & Balasubramanian, 2009). Marketers began to create so-called branded apps, apps that display a brand identity in the name of the app and the appearance of a brand logo or icon, to increase the attention of users toward the sponsoring brand (Bellman *et al.*, 2011; Noort & Reijmersdal, 2019).

The mobile growth also established novel ways in which customers consume and interact with direct marketing campaigns (Lachner, Arnold, & Wangenheim, 2017). Nowadays, the mobile direct marketing (MDM) allows retailers to reach potential and current customers with meaningful and relevant messages anytime and anywhere, through asynchronous interactions with mobile devices through several different channels, including email, SMS or mobile apps push notifications. From the perspective of consumer behavior, MDM is a tool to build durable relationships between retailers and consumers, so companies are continually creating new marketing campaigns on these channels to leverage their results (Solomon, 2012; Kannan & Li, 2017; Andrews, Goehring, Hui, Pancras, & Thornswood, 2016; Gázquez-Abad, Cannière, & Martínez-López, 2011; Vriens, Scheer, Hoekstra, & Bult, 1998).

One of the MDM channels is push notifications, short messages invoked by mobile apps that show up on the device's home or lock screen, which help alert users and may lead them directly to the landing page of the app after a tap on the message (Lee & Gopal, 2016). Push notifications enable marketers to directly interact with their customers when used as direct marketing tools (Lachner, Arnold, & Wangenheim, 2017), to drive specific behaviors on customers in the short-term (Andrews *et al.*, 2016).

1.2. Research Problem

Situated in the consumer behavior area, specifically on business-to-consumer segment, with direct marketing and digital marketing as theoretical delimitations, the aim of this research is to explore the effect of promotional MDM campaigns sent via push notifications from the mobile applications owned by Portuguese retail supermarkets chains, with the objective of identifying the existence of an effect on purchase behavior. Specifically, this research sought to measure the effect of these app push notifications in terms of quantitative variables as the recency, frequency, and monetary value of expenditures.

Moreover, once different users can have different goals during the purchase process, it also becomes essential to explore the effect of push notifications on the purchase behavior of different segments users towards their psychographic characteristics.

Considering these research problems and objectives, the present questions of this investigation are threefold:

1. Is there an influence of push notifications from branded apps in the purchase behavior?
2. Are there different segments of supermarket shoppers in terms of psychographic characteristics?
3. Is the influence of push notifications from branded apps in the purchase behavior different for different segments of supermarket shoppers?

1.3. Academic and Managerial Relevance

Academically, while the use of mobile in marketing practice is growing dramatically and mobile apps play a central and critical role in stimulating purchases, the literature is limited and is evolving gradually (Shankar *et al.*, 2016; Liu, Zhao, & Li, 2017). This limitation on the literature is also seen on the branded apps subject on the topic about their uniqueness, and persuasive impact as a marketing channel (Noort & Reijmersdal, 2019).

Therefore, this research intends to contribute by increasing the literature on these topics, at the same time address some of the research agenda topics proposed by Kannan & Li (2017), where the authors indicate the need of a better understanding of the contribution of mobile devices to marketing outcomes to communicate promotions and the impact on customer spending regarding different psychological factors.

Another academic contribution is in the literature about mobile marketing in Portugal, because retail environments significantly differ based on cultural differences across countries, mobile marketing will have different effects (Shankar *et al.*, 2010; Ström, Vendel, & Vendel, 2014; Pantano & Priporas, 2016).

The results of the research would help retail managers and marketers to understand how to deploy more effective direct marketing campaigns (Gázquez-Abad *et al.*, 2011), with a better understanding of extension of the benefit of new technologies such as push notifications on retail performance in sales, especially with multi-channel customer touchpoints (Verhoef, Kannan, & Inman, 2015; Kannan & Li, 2017). This is a relevant characteristic on the Portuguese supermarket industry, where 98% of the purchases are made inside a store (Kantar, 2019), there over in an offline environment, what makes the reactions to push notifications a multi-channel webrooming action, once mobile channel was included to expand the webrooming construct of online access and processing and offline purchases (Santos & Gonçalves, 2019).

The Portuguese supermarket industry would also benefit from this research because they show a prolific use of promotional offers, once 45% of their 19.5 millions of euros in sales volume in 2016 was of products under promotional campaigns (Associação Portuguesa de Empresas de Distribuição, 2017) and 81% of the Portuguese consumers take advantage of the offers and promotions of the products they usually buy (Nielsen, 2018).

From a user perspective of the investigator, there is also seen a prolific usage of push notifications from the supermarket branded apps to draw the attention for promotional campaigns of the respective brands, leading to specific promotional pages within the app. The understanding of whether push notifications increase sales performance in different consumers would benefit retailers of this segment to understand how they can strategically add push notifications on their marketing channels strategy, which will allow them to deliver more effective MDM campaigns.

1.4. Structure of the Study

The present thesis is organized in six chapters, which are: introduction; literature review; research model and hypotheses; methodology; analysis and discussion of results; conclusions, contributions, limitations, and research suggestions.

Firstly, the introductory chapter presents a brief theoretical contextualization of the theme, followed by the enumeration of the study objectives and research problem, and the academic and managerial relevance of the present study.

As for the literature review segment, it contains a set of useful concepts to support the development of the research, namely: relationship; relationship marketing; direct marketing; mobile apps and branded apps; mobile marketing; mobile direct marketing and app push notifications; multi-channel consumer and webrooming.

In the following chapter, it is created the theoretical model that guided the study, as well the research hypotheses.

The fourth chapter concerns the methodological orientation of the research and is subdivided into: type of study; population and sampling technique; data collection; survey; measurement and scales; and data processing.

The penultimate section of this dissertation contains the analysis of results, where it is possible to verify the characterization of the sample, the synthesis of indices, the analysis of reliability and internal consistency, as well as the validation of the hypotheses under investigation and the results discussion.

The last chapter presents the conclusion, the contributions, both academic and business, the limitations of the study and, finally, some considerations for future research.

2. LITERATURE REVIEW

2.1 Mobile

The definition of mobile finds similarities in different researches. According to Shankar & Balasubramanian (2009), Shankar *et al.* (2010), Peng, Chen, & Wen (2014), Grewal *et al.* (2016) and Shankar *et al.* (2016), mobile can be defined as any centrally connected handheld portable devices with operating systems and communication capabilities, which can be used in motion. Besides, the mobile device is regarded by the authors as a highly individualized and essential personal communication tools, generally not shared. Moreover, because of its personal nature, the mobile device is not just a technological gadget, but a cultural object as well, being a constant companion to the consumer.

From a technology standpoint, Shankar *et al.* (2010) and Shankar *et al.* (2016) say that the frequent use of the mobile device as a cultural object has led to the mobile lifestyle way of life in which consumers routinely use mobile devices for several activities and make decisions on the move. According to the authors, they have genuinely enabled consumers' ubiquitous access to digital information, anytime and anywhere, which means that mobile devices allow marketers to reach consumers more directly and continuously, which is different from the real environment in the traditional retail channel.

The behaviors of consumers using mobile phones are different from desktop computer behaviors (Kim, Kim, Choi, & Trivedi, 2005), causing a dynamic shift in goal pursuit (Shankar *et al.*, 2016). Retail consumers use the mobile for a variety of activities relating to shopping, which include creating a shopping list, searching for the right products and prices, querying retailers, comparing different items, purchasing items, and indulging in post-purchase activities (Shankar *et al.*, 2010). Retailers, on the other hand, can facilitate the interactions with the consumer and develop buying process independent of time and location constraints (Steinhoff *et al.*, 2018).

2.1.1 Mobile Applications

As smartphones become more mainstream, it has been immensely prevalent the usage of mobile applications (apps), software applications installed and executed on smart mobile

devices, explicitly designed to add functionality and interact directly with the technical features of the phone (Peng, Chen, & Wen, 2014; Liu, Zhao, & Li, 2017).

Mobile devices allow shoppers to use multiple apps, surf the web, and use audiovisual features such as talking and viewing (Shankar *et al.*, 2016). The app effectively stimulates communication and encourages customers to share their personal information (Steinhoff *et al.*, 2018), and enables personalization, which is beneficial for building relationships between customers and business (Steinhoff *et al.*, 2018).

In addition, the mobile apps with the highest chance of success in a crowded device environment are those that balance functional needs with hedonic and social affiliation needs (Shankar *et al.*, 2016). Enjoyment, usefulness, and ease of use had positive, significant impacts on consumers' intention to use mobile apps (Peng, Chen, & Wen, 2014).

2.1.2 Branded Mobile Applications

Along with the proliferation of mobile apps, there has been a rapid growth in branded mobile applications (branded apps), being defined by Peng, Chen, & Wen (2014) and Alnawas & Aburub (2016) as software for mobile devices which prominently displays a brand identity via the name of the app and the appearance of a brand logo throughout the user experience, either pre-installed or downloaded from various mobile app stores such as Google Play and Apple's App Store.

Mobile apps have generated substantial interest among marketers, because of their high level of user engagement and the positive impact on a user's attitude toward the sponsoring brand (Bellman *et al.*, 2011), once they voluntarily and deliberately download and install an app and spend time using them (Noort & Reijmersdal, 2019).

Peng, Chen, & Wen (2014) and Alnawas & Aburub (2016) say that branded apps are developed to satisfy a range of different needs including entertainment, communication, information, and commerce, with the hope that consumers' past engagement and experience with the brand can influence their consumption behaviors in mobile app markets.

Zhao and Balague (2015) identified five business objectives when developing branded apps, namely: communication (i.e. improve brand image and awareness); Customer Relationship Management (i.e. managing firm interactions with customers); sales (i.e. location awareness, context sensing and product customization); product innovation (i.e. allowing consumers to generate new ideas for products); and marketing research (i.e. helping firms survey their customers in new ways).

When the company's brand name is attached to the app, the company's loyal customers would continually appreciate their relationship with the brand and therefore adopt the app (Peng, Chen, & Wen, 2014). Moreover, branded apps increase interest in the brand and product categories, subsequent spending on a brand and specific cognitive and affective brand responses (Noort & Reijmersdal, 2019).

The use of interactive features of a branded app improve shopper awareness of products and increases app adopters' spending levels, but when shoppers discontinue using the app, their spending levels decrease (Shankar *et al.*, 2016). So, adopting a firm's mobile app positively affects customers' overall consumption values and subsequent purchases, primarily if customers use more features provided by the app and rely on the app repeatedly (Peng, Chen, & Wen, 2014; Steinhoff *et al.*, 2018).

2.2 Relationship Marketing

A relationship between the buyer and the seller consists of ongoing, intentional, non-accidental interactions, like purchases and communications, moving beyond discrete transactional exchanges (Dwyer, Schurr, & Oh, 1987). It is developed through trust and commitment achieved after repeated satisfactory interaction between both sides of the transactions, as they perceive some net benefit relative to the available existing alternatives, acquire experience and know what to expect from one another (Gázquez-Abad *et al.*, 2011; Pansari & Kumar, 2016; Steinhoff, Arli, Weaven, & Kozlenkova, 2018).

Relationship marketing definition encompasses marketing activities directed toward establishing, developing, and maintaining these fruitful relational exchanges (Steinhoff *et al.*, 2018). The repeated exposure to advertising can lead to a positive attitude towards the company, and less likelihood of the customer 'forgetting' the company over time (Gázquez-Abad *et al.*, 2011).

According to Sheth & Parvatlyar (1995), Buckinx & Poel (2005) and Steinhoff *et al.* (2018), relationships simplify buying and consuming tasks, information processing, reduce uncertainty and perceived risks, maintain cognitive consistency and a state of psychological comfort. When consumers make such relationship commitments, they repeatedly purchase the same brand of products or services and forgo the opportunity to choose another product and service that also serves their needs when they engage in choice situations, such as buying and consuming foods and beverages (Sheth & Parvatlyar, 1995). As result,

companies have better results in terms of share-of-wallet and profitability, when compared with the average customer (Pansari & Kumar, 2016).

The advances in technology have influenced consumer behavior and the relationship between consumers and companies as a result of the access to a variety of online and mobile devices (Kannan & Li, 2017) to interact with the retailer (Neslin *et al.*, 2006) and to make the purchases (Konus *et al.*, 2008; Dholakia *et al.*, 2010).

Companies make considerable efforts how to build, grow, and retain strong relationships with their customers (Steinhoff *et al.*, 2018), and staying ‘in touch’ has become a pivotal determinant to this relationship-building process (Gázquez-Abad *et al.*, 2011), once the consumer's expectations of future positive reinforcement is one of the motives that they engage in relationships with brands (Sheth & Parvatlyar, 1995).

Consumers need some guiding force to determine which properties are relevant and useful for creating meaning, especially in scenarios with a significant number of different products options and features to be chosen. Therefore, marketers can create a purposeful choice reduction behavior on consumers and engage in an ongoing loyalty relationship in terms of repeat sales, by communicating messages that are involving (Sheth & Parvatlyar, 1995; Puccinelli *et al.*, 2009; Pansari & Kumar, 2016) through a variety of strategies and tactics of consumer–channel interactions (Dholakia *et al.*, 2010).

Relationship marketing practices can improve marketing productivity by making it more effective and efficient in meeting consumer needs, which leads to an increase of the customer involvement with the organization (Sheth & Parvatlyar, 1995). Marketers who follow this philosophy interact with customers regularly and give them reasons to maintain a bond with the company over time (Solomon, 2012) by establishing and enhancing a long-term, mutually beneficial relationship between the consumer and the marketer (Sheth & Parvatlyar, 1995).

Much of what marketers do is to attract the attention of the consumer and communicate a message, but an equally important attribute lies with the consumer: the degree to which he or she is involved, engaged or views the message as important. (Puccinelli *et al.*, 2009). In this context, it is necessary to understand what motivates consumers to reduce their available market choices and engage in a relational market behavior (Sheth & Parvatlyar, 1995).

Moreover, the channel choice is a crucial decision in terms of creating resonance and strengthen brand attachment, once it permits feedback opportunities for consumers with a

brand and engages different segments of consumers by reflecting their particular interests and behaviors (Keller, 2009; Dholakia *et al.*, 2010).

2.3 Mobile Marketing

Formerly in the traditional offline channels, following Shankar *et al.* (2010), retailers could interact with a potential customer only when they were near the store. In the mobile channel, according to the authors, the retailers can constantly enter the customer's environment and interact with the customers everywhere, leading to the development of the mobile marketing.

Shankar & Balasubramanian (2009) define mobile marketing as the two-way or multi-way communication between a retailer and its customers using a mobile medium, device, or technology, which include mobile advertising, promotion of an offer, customer support, and other relationship-building activities.

The growing mass audience for mobile electronic communication made mobile a popular channel for marketers to reach customers according to segmentations, with marketing campaigns in the form of text, audio, or video, with the intention of generate awareness, draw attention to aspects of the product, influence the purchase behavior and build relationship (Rettie, Grandcolas, & Deakins, 2005; Shankar & Balasubramanian, 2009; Shankar *et al.*, 2010; Lee & Gopal, 2016; Lachner, Arnold, & Wangenheim, 2017).

Due to the time-sensitive and location-sensitive nature of the mobile medium and devices, mobile marketing changed the paradigm of retailing, according to Shankar *et al.* (2010). The influence of mobile on shopping affects every stage in the shopping cycle of the shopper, and the implications of mobile marketing extend far beyond the physical store, on all the planning and execution steps of the purchase (Shankar *et al.*, 2016).

Because the mobile device stays with the consumer, retailers can now enter the consumer's environment through these devices, anywhere and anytime (Shankar *et al.*, 2010) with increasingly relevant offers (Grewal *et al.*, 2016), which result in increased loyalty to retailers and a higher perceived relative values due to an assumable "stickiness" of mobile marketing (Ström, Vendel, & Vendel, 2014). For these authors and Liu, Zhao, & Li (2017), by adopting a strategy of engaging consumers in two-way interactions, mobile marketing also assumed two distinct functions. The first is improving transaction-based results as traffic to stores and sales. The second is brand relationship results in brand awareness, associations, attitudes, satisfaction, purchase intentions, and loyalty.

For relationship marketers, mobile apps are powerful tools to communicate and stay close to customers at all times in an interactive and relevant manner (Liu, Zhao, & Li, 2017; Steinhoff *et al.*, 2018). For Andrews *et al.* (2016) and Shankar *et al.* (2010), marketers can plan and execute mobile-based marketing promotions that aim to drive specific consumer behavior in the short term and influence shoppers along and beyond the path-to-purchase: from shopping trigger, to purchase, consumption, repurchase, and recommendation stages. To the authors, the purchase behavior does not necessarily have to be planned. Instead, they say that mobile promotions may help stimulate unplanned or impulse buys at or near the point of purchase.

2.4 Direct Marketing

In a multi-channel marketing environment, companies need to motivate customers to shop more frequently through increased interaction and to build lasting customer relationships (Chang & Zhang, 2016). Gázquez-Abad *et al.* (2011) and Verma, Sharma, & Sheth (2015) states that direct marketing (DM) is one of the instruments that aid in relationship marketing efforts to achieve the objectives of customer satisfaction, loyalty, and retention. The same authors also say that the frequent use of DM in many retail sectors in a highly profitable way suggests that there is a belief that such campaigns do influence customer behavior.

Moreover, companies can contact their customer base through multiple DM channels, such as direct mail, direct response advertising, telemarketing, email, and sales personnel, to inform customers about the multitude of options available for purchasing products (Kumar & Venkatesan, 2005; Rettie, Grandcolas, & Deakins, 2005), to reduce the uncertainty and the effort surrounding a decision (Vafainia, Breugelmans, & Bijmolt, 2019).

For Gázquez-Abad *et al.* (2011), the objectives of DM are categorized as cognitive (transferring information, brand awareness), affective (image building) and behavioral (accomplishing sales or information inquiries). In addition, according to Vafainia, Breugelmans, & Bijmolt (2019), DM communications positively influence consumer behavior because retailers' investments in customer relationships result in psychological bonding perceived by the customers. The authors conclude that, as customers increase their confidence associated with the decision after the DM campaigns, they feel obliged to return "good for good" by making a purchase.

One of the uses of DM is to encourage consumers to react immediately by including a specific ‘call to action’ (CTA) with short-term rewards that can create interest in a product/service and thereby lead to a final purchase (Gázquez-Abad *et al.*, 2011). CTA DMs that include an incentive have a higher positive impact on customer's purchase compared with those without an incentive (Vafainia, Breugelmans, & Bijmolt, 2019).

According to Vriens *et al.* (1990), once DM can engage in precision targeting to a higher degree than other media, it offers the opportunity to personalize to any desired degree, and have substantial flexibility concerning formats, timing, and testing. DM also has as advantages of the absence of direct competition for the attention of the customer, and the capacity to involve the respondent (Gázquez-Abad *et al.*, 2011).

However, DM also serves as a long-term reinforcement of the retailer's message, especially with campaigns that seek to enhance the retailer's image, to foster the relationship with the customer and to encourage long-term loyalty by merely informing customers (about products or the retailer itself), with messages without explicitly rewarding for taking an action, or without overtly inviting any specific action (Gázquez-Abad *et al.*, 2011; Vafainia, Breugelmans, & Bijmolt, 2019).

2.4.1 Mobile Direct Marketing

The widespread use of mobile devices has changed how customers consume direct marketing campaigns and entail new opportunities and challenges for marketing managers, according to Lachner, Arnold, & Wangenheim (2017). To satisfy customer needs profitably, retailers engage in many mobile marketing practices, which include providing alerts, fulfilment updates, advertisements, or coupons for the consumers to access instantly, to grab this particular consumer's attention and move her closer to a store (Shankar *et al.*, 2010; Grewal *et al.*, 2016).

Mobile direct marketing (MDM) is defined by Rettie, Grandcolas, & Deakins (2005) and Grewal *et al.*, (2016) as marketing activities that deliver advertisements to mobile devices to generates awareness, stronger brand attitudes, and direct behavioral responses. MDM can be used as a tool to improve consumer brand relationships between purchases or interactions, which can be seen as brand satisfaction and relationship investments (Ström, Vendel, & Vendel, 2014).

By using these direct forms of mobile marketing, retailers can foster a main channel use and increase loyalty to a store network as well, using mobile push media to drive traffic

to mobile pull media, with a higher interactivity and media richness, making it an effective category in terms of branding effects (Ström, Vendel, & Vendel, 2014). The repeated presentation of stimuli, such as the notifications from the retailer on the mobile app, increases the positive effect on customers based on elements, such as liking and emotions, induced by mere exposure to the advertisement (Lee & Gopal, 2016).

To be effective, MDM should be permission-based (Bellman *et al.*, 2011). In the initiation stage of the relationship with the retailer, the consumer voluntarily agree to receive MDM communications from a specific online retailer because their offerings are relevant to their needs and expects to be notified about new product releases and special promotions that provide relevant solutions to their specific consumption needs (Shankar *et al.*, 2010; Reimers, Chao, & Gorman, 2016).

A common strategy for marketers is sending mobile offers and coupons that can be redeemed at the retailer's stores, using a wide range of MDM channels such as mobile emails, short messages service (SMS) and app push notification, to those who formally accepted opted to receive these marketing messages (Shankar *et al.*, 2010; Andrews *et al.*, 2016; Lee & Gopal, 2016; Kumar & Salo, 2016; Steinhoff *et al.*, 2018).

The SMS channel was first introduced in 1992 and has proliferated as a proficuous MDM channel (Rettie, Grandcolas, & Deakins, 2005). Marketers used SMS services as a media in the consumer communication channel structure, alone or paired with existing channels, for promotional activities of different marketers (Shareef, Dwivedi, Kumar, & Kumar, 2017). Any product/service manufacturer, retailer, or third party can send messages through SMS to millions of prospective customers with minimal effort, time, and cost in the hope that customers might respond to the intended meaning of the message anywhere and at any time (Shareef *et al.*, 2017).

Other MDM channel, according to Reimers, Chao, & Gorman (2016) and Zhang, Kumar, & Cosguner (2017), is email marketing, a promotional email sent to consumers who have given consent to receive such messages. Although the email marketing had a predominance in desktop environment, this channel has seen an migration to mobile, with 55% of the emails been open in this channel in 2017, an increase of 89% when compared with the 29% of emails opened in mobile devices in 2012 (ReturnPath, 2017).

Email marketing makes it easier for online retailers to penetrate the promotional clutter that characterizes the modern-day marketplace (Reimers, Chao, & Gorman, 2016), serving as a means for two-way interaction between an online retailer and its customers, in

a cost-effective way (Reimers, Chao, & Gorman, 2016). This has persuaded many organizations to make email marketing the cornerstone of their communications strategy (Reimers, Chao, & Gorman, 2016; Zhang, Kumar, & Cosguner, 2017).

2.4.2 App Push Notification

Nowadays, marketing managers are increasingly required to integrate their offers and marketing initiatives with the still ongoing expansion of the mobile Internet, and require more and better direct marketing tools that provide bi-directional communication and mobile push notifications meet these requirements (Lachner, Arnold, & Wangenheim, 2017), by enabling customer interaction with short messages invoked by mobile apps that show up on the device's home or lock screen (Lee & Gopal, 2016).

Push notifications represent an innovative channel for drawing the attention of the mobile app customer, and viewing the landing page of a targeted product, allowing customers to purchase at their convenience (Lee & Gopal, 2016). Greater attention leads to a deeper processing of the advertisement and the implied promotion of a product/service and a more advanced cognitive process of evaluation (Lee & Gopal, 2016), leading posteriorly to a higher purchase intentions and brand loyalty (Lachner *et al.*, 2017).

In addition, following Lee & Gopal (2016), even though the format of the push notification is consistent, each specific notification varies in terms of the product being promoted and the message theme, what enhance the unexpected nature of the advertisement, and thus the extent to which the notification is able to lead to positive affect. Lee & Gopal (2016) complement that the greater the exposure of the customer to the push notification, by virtue of prior downloads of the retailer's app, the higher is the likelihood that the customer will view the landing page of the targeted product, and purchase the targeted product.

Although mobile advertisements have potential downside effect for consumers, such as inappropriate time and information overload (Andrews *et al.*, 2016), push notifications are less obtrusive while being concise and succinct when compared to other mobile advertisement channels, once push notifications are easy to check with a glance and ignore if so desired (Lee & Gopal, 2016). Related with the concept of permission-based marketing, users can individually choose whether they want to receive (opt-in) push notifications messages or when they want to unsubscribe (opt-out) from the service (Lachner *et al.*, 2017). Moreover, strategies of over-marketing can make users withdraw more quickly, making

mandatory to retailers evaluate the frequency and the relevance of their messages to avoid reactance with the customer (Lachner *et al.*, 2017).

2.4.3 RFM Model

In the field of direct marketing, Buckinx & Poel (2005) states that RFM variables are well-known predictors for separating behaviorally loyal customers from non/less-loyal clients. According to Coussement, Bossche, & Bock (2014), RFM analysis originates from the practice of direct marketing in catalogue sales companies in the 1960s to identify a segment of customers who have a high probability of responding to a marketing campaign.

Buckinx & Poel (2005) summarize the RFM model on its three attributes. The first is 'recency', which represents the number of days that passed between the last transaction and the end of our observation period. The second is 'frequency', which is related to the number of shop visits, which a customer purchases/uses a product/service. The third is 'monetary value', referring to the accumulated amount of money spent by a customer on purchase from a company.

The studies of Coussement, Bossche, & Bock (2014) and Dursun & Caber (2016) show that customers who purchased recently, frequently, and spent large amounts of money are more likely to respond to direct mailings, and therefore, represent more attractive prospects for future marketing campaigns.

About the importance of RFM model, Gázquez-Abad *et al.* (2011), Coussement, Bossche, & Bock (2014), Chang & Zhang (2016) and Dursun & Caber (2016) refers to RFM model as a well-known powerful method and the simplest marketing technique for generating knowledge from customers data, which extracts the customer profile by using few numbers of criterions, and reducing the complexity of analysis. The authors mention that the RFM model is popular in customer segmentation in the business to consumer area and that statistics of RFM variables are often readily available because many companies keep track of their customers' purchase histories in databases. The authors also say that RFM approach has been extensively used to analyse past purchase behavior in several contexts to predict the customers' short-term future behavior, identification of profit-generating customers, generation of new products or services, and on the measurement of the customer lifetime value for the retailers.

2.5 *Omni-channel Consumer*

The advent of the online channel and new additional digital channels such as mobile channels, and the integration of these new channels in online and offline retailing, have changed retail business models, the execution of the retail marketing mix, and shopper behavior, not only broadening the scope of channels, but also integrating consideration of customer-brand-retail channel interactions (Verhoef, Kannan, & Inman, 2015).

Multi-channel consumers are those that use multiple channels during the purchase process to better satisfy their shopping needs, to search for information about products, corroborate this information and make the purchase, switching and combining the virtual and physical channels in order to gather information about the product, to make the purchase decision (Verhoef, Kannan, & Inman, 2015; Frassetto, Mollá, & Ruiz, 2015).

In response to this multi-channel consumer behavior, marketers are challenged to communicate and deliver goods and services via two or more synchronized channels, thus create multi-channel marketing strategies, consisting on the design, deployment, coordination, and evaluation of channels to enhance customer value through effective customer acquisition, retention, and development (Payne, Peltier, & Barger, 2017). In this context, SMS, email and push notifications can be considered as separate channels within the online medium (Verhoef, Kannan, & Inman, 2015).

However, the meteoric growth of mobile platforms as a consumer touchpoint has necessitated a change in the perspective to a omni-channel marketing, a customer-centered focus featuring a “holistic” shopping experience, one in which a customer’s buying journey is smooth and seamless, irrespective of the channels used (Payne, Peltier, & Barger, 2017).

Multi-channel marketing and omni-channel marketing share similar traits and particularly with regard to message consistency across customer touchpoints (Payne, Peltier, & Barger, 2017). Firms seeking to optimize performance for each channel are practicing multi-channel marketing, whereas firms focusing on overall customer profitability across all channels are using omni-channel (Verhoef, Kannan, & Inman, 2015), seeking to understand the consumers and what determines their channel choice (Neslin *et al.*, 2006) and integrating channels to retain consumers along the entire purchase process (Frassetto, Mollá, & Ruiz, 2015).

Instead of viewing communication touchpoints in the context of customer choices, omni-channel marketing requires a unification of the total collection of available tools and platforms into a single-choice environment (Payne, Peltier, & Barger, 2017). With this

increasingly dominant omni-channel approach, emerges the need of a synergistically management of these DM channels, in such a way that the customer experience across channels and the performance over channels are optimized (Steinhoff *et al.*, 2018), providing a seamless omni-channel experience as the consumer switch across channels and devices (Verhoef, Kannan, & Inman, 2015), which motivate customers to shop more frequently through increased interaction and to build lasting customer relationships (Chang & Zhang, 2016).

2.5.1 Webrooming

The proliferation of mobile channel formats in retailing has extended the consumers' channel choices beyond the traditional catalogue, store, and online channels, which make omni-channel consumer behaviors more complex (Santos & Gonçalves, 2019). In their purchase process, consumers can use different combinations of online and physical channels to search for information about products (Frasquet, Mollá, & Ruiz, 2015). Shoppers now frequently search for information on the store and simultaneously search on their mobile device to get more information about offers and may find more attractive prices, which is called showrooming (Verhoef, Kannan, & Inman, 2015).

The opposite combination also occurs. According to Kim, Libaque-Saenz, & Park (2018), although consumers make purchases through offline stores, they do not necessarily rely only on this channel for searching for information about products. The authors say that consumers may use online channels for searching information from various stores in a natural way before purchasing a product at offline stores where they can test and touch the product, which is known as webrooming. This behavior is expected to be especially significant because of the development of mobile technologies (Frasquet, Mollá, & Ruiz, 2015) with its characteristic unrestricted physical and temporal access to information for online decision (Santos & Gonçalves, 2019).

The effects for retailers of integration of mobile marketing, in all the numerous available channels and customer touchpoints, increased the effectiveness of brand communication, and improved service interactions in-store and post-purchase (Ström, Vendel, & Vendel, 2014). The outcome value of combined MDM channels increased compared to direct marketing for companies, while the integration of mobile push and pull advertising outperformed traditional advertising (Ström, Vendel, & Vendel, 2014).

2.6 Grocery Shoppers

Konus *et al.* (2008) state that specific segments of consumers might align with specific channels and, in this case, marketers must understand the characteristics or covariates of these segments to determine how to design and target their multi-channels experience. Grewal *et al.* (2016) say that the success of marketing campaigns depends on an ever better understanding of environmental, consumer, and technological context variables. Lachner *et al.* (2017) highlight the marketers need to consider additional dimensions when creating or fine-tuning their campaigns.

Regarding supermarkets, Atkins, Kumar, & Kim (2016) highlights that the European food retail sectors are undergoing a dramatic shift because of changing consumer and retail trends. According the authors, the grocery category has been traditionally classified as convenience goods that involve minimal purchasing effort or time and little consumer preference, but this view has been challenged to treat groceries as preference products instead of convenience products, while customers seek to maximize the benefits associated with the shopping experience.

Moreover, Atkins, Kumar, & Kim (2016) say that, to be able to segment grocery shoppers, the first step is to understand the activities that shoppers engage in prior and during to grocery shopping. They conclude by saying that the understanding of consumer evaluations enables retailers to focus on customer satisfaction and customer relationship management in the competitive external environment.

Konus *et al.* (2008) and Atkins, Kumar, & Kim (2016) consider the customer decision making as a forward-looking process to maximize their utility, by assessing several costs and benefits that may be coloured by the customer's psychographic profile. Such customer differences in psychographic variables, according to Konus *et al.* (2008), should elicit different benefits and costs from searching and purchasing phases.

From all the psychographic variables analyzed by Konus *et al.* (2008), four of them find resonance on the work of and Atkins, Kumar, & Kim (2016) in the segmentation of grocery shoppers on the purchase process: saving effort (switching brands and retailers demands costs from consumers, therefore consumers may tend to remain loyal and deliberately cut off other options); right product (hedonic value and enjoyment gained from shopping), saving money (consumer seeks to minimize the price paid for an item); and saving time (consumer's predisposition to consider time a scarce resource and plan its use carefully).

3. CONCEPTUAL FRAMEWORK AND RESEARCH HYPOTHESES

The role of direct marketing on changing the consumers' purchase behavior has been examined in the marketing literature. Gázquez-Abad *et al.* (2011) consider direct marketing campaigns as a mechanism to reinforce relationships and to influence a customer's behavior both in terms of making a purchase decision. Vriens *et al.* (1990) say that these behavioral effects (e.g. accomplishing sales or information inquiries) can be defined by the so-called RFM-variables model (recency, frequency, and monetary value), which allow to analyse the consumer behavior by measuring the consumer response of the direct marketing campaigns.

Konus *et al.* (2008) clustered consumers based on hedonic and economic variables, and Atkins, Kumar, & Kim (2016) reinforced this subject by segmenting grocery shoppers based on their psychographics variables on the purchase process.

These factors form the basis for the conceptual model of the present study, which is shown in Figure 1, adapted from the conceptual models of Gázquez-Abad *et al.* (2011) and Konus *et al.* (2008). The factors in the model are discussed in greater detail below.

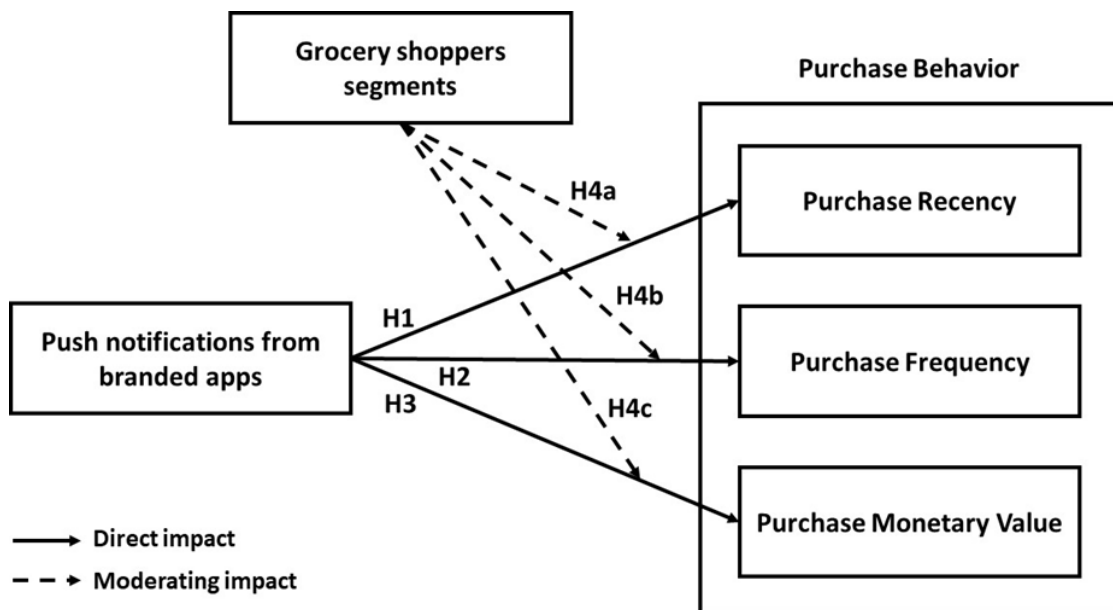


FIGURE 1 - Conceptual framework

In the direct marketing context, Gázquez-Abad *et al.* (2011) and Vafainia, Breugelmans, & Bijmolt (2019) states that RFM variables have been shown to be significant response of consumer to direct mail campaigns and its positive influence customers' purchase in a higher purchase frequency, lower purchase recency, and longer relationship duration.

About the different DM channels, Ieva, Gázquez-Abad, & Dattoma (2017) analyzed several studies on the difference between print and online promotional communication and found no difference in effect between them on purchase behavior and consumer memory, concluding that these media are equally effective.

Specifically about MDM, Ström, Vendel, & Vendel (2014), states that push notifications can substitute other forms of direct marketing and increase communication effectiveness for low involvement categories. Lachner *et al.* (2017) complete by stating that mobile push notification is a direct marketing tool comparable to regular SMS, but takes less effort to react. Furthermore, the authors say that mobile push notifications seem to offer more convenience for the customer than other direct marketing tools.

Connecting MDM channels and the RFM model, Park, Park, & Schweidel (2018) described in their study about RFM variables and SMS on the mobile phones that there were a smaller average of the elapsed time since a customer's last purchase, a higher average of number of purchases made by the customer in the past over the data period, and a higher average of purchases value amount at the most recent transaction on the group who received a coupon via SMS compared with the group who did not receive a coupon.

From the above discussion, for this investigation, push notifications replace direct mail as promotional direct marketing channel that may influence purchase behavior on the model created by Gázquez-Abad *et al.* (2011). Therefore, it is proposed the three following hypothesis:

H1: Customers who received promotional push notifications in a branded app of supermarkets have a smaller elapsed time since the last purchase.

H2: Customers who received promotional push notifications in a branded app of supermarkets have a higher number of purchases made.

H3: Customers who received promotional push notifications in a branded app of supermarkets have a higher average of purchases value amount at the most recent transaction.

To deploy more effective campaigns, according to Vriens *et al.* (1998), marketers need to know how promotional campaigns influence the behavioral components of this direct response process. Dholakia *et al.* (2010) states that consumers choose and use channels based on their specific goals at a particular point in time, and various channels

provide consumers with unique affordances and constraints as they vary in terms of how much they can facilitate or hinder shopping goals.

On the direct marketing subject, Reimers, Chao, & Gorman (2016) studied how email marketing positively influences the perceived usefulness, ease of use and enjoyment derived from the shopping process. Furthermore, by highlighting relevant new products and special promotions, email marketing can reduce consumers' search and purchase costs.

Gázquez-Abad *et al.* (2011) and Vafainia, Breugelmans, & Bijmolt (2019) identified the existence of a high heterogeneity on the customers' response to direct marketing and have called for further research on the moderating effects of customer characteristics and how retailers can differentiate their DM communications based on customers differences.

Over this topic, together with the statement from Konus *et al.* (2008) that consumer behavior is driven more by psychographics than demographic variables, and with the statement from Atkins, Kumar, & Kim (2016) that different segments of grocery shoppers have different purchase behaviors, the fourth hypothesis is therefore proposed:

H4a: Different grocery shoppers segments affect the recency of the last purchase.

H4b: Different grocery shoppers segments affect the frequency of purchases.

H4c: Different grocery shoppers segments affect the monetary value spent on purchases.

4. METHODOLOGY

4.1. Type of Research

Considering the objective of the present study, the research was conducted under a pragmatic philosophy that argues that the epistemology, ontology, and axiology adopted are the ones more appropriate to answer the research questions (Saunders, Lewis, & Thornhill, 2012).

A deductive approach was used to the research, with a hypothesis deduced from theory, expressed in operational terms and tested, followed by an examination of the outcome to confirm or not confirm the theory (Saunders *et al.*, 2012; Malhotra, Birks, & Wills, 2012). Having the purpose of explaining the relationship between the variables under study, the nature is defined as explanatory (Saunders *et al.*, 2012), to establish relationships between the psychographic characteristics of consumers and their attitudes towards purchases on supermarkets.

The strategy adopted for this research was a questionnaire survey, which can facilitate analysis and comparison and used to conclusively answer the research questions (Malhotra *et al.*, 2012), and, at the same time, is economically accessible, making it possible to obtain a large number of data (Saunders *et al.*, 2012). Due to time constraints, this research is a cross-sectional study (Saunders *et al.*, 2012).

4.2. Population and Sample

A non-probabilistic purposive heterogeneous sampling was adopted for this research. This technique is based on the investigator's judgment in selecting the cases that make up the sample enabling to answer the proposed questions with selected cases, what was expected to bring results that can add value to the research (Saunders *et al.*, 2012).

According to Malhotra *et al.* (2012), the population is a set of elements that share a particular characteristic among them, from which information is intended to be acquired. Thus, the target was men and women between 20 and 60 years, customers of the listed Portuguese supermarkets who have at least one of the listed apps of Portuguese supermarket chains: Aldi, Cartão Continente, Continente, El Corte Inglés, Jumbo (currently Auchan), Lidl, Minipreço and Pingo Doce. Paid advertisement of the questionnaires was made in the social networks Facebook and Instagram, to target who already followed the listed supermarket chains on these social networks, or that has an interest in the supermarket subject according to the advertising tool of the social network.

4.3. Data Collection

This research is characterized as quantitative research, the methodological choice being the single method, more precisely a inquiry. Thus, the primary data was acquired by a structured survey strategy with self-administered internet-mediated questionnaires, to examine and explain the relationship between the analyzed variables (Saunders *et al.*, 2012).

The questionnaire took place online, namely through the social networks Facebook and Instagram, using the Qualtrics and SurveyMonkey platforms, between May 18 and June 8, 2019.

4.4. Survey

In order to meet the objectives of the present study and test the hypotheses developed, a questionnaire was formulated to meet the indications suggested by Malhotra *et al.* (2012) with: study identification, cooperation request, instructions, intended information (recency,

frequency and monetary value expended in purchases in supermarkets, the possession of a supermarket app from the target list, the receipt of push notifications and psychographic characteristics towards supermarket purchases) and socio-demographic data with characteristics of the respondents for classification.

In order to rule out any problem that the respondents might have in performing the questionnaire and also to verify the validity of the questions, as well as the reliability of the data collected, a questionnaire pre-test was performed. It had 13 complete answers by individuals with the same characteristics of the intended sample. Subsequent changes were made and their final version available for consultation in Appendix 2.

4.5 Survey Structure

In summary, a filter question was used in order to prevent the progression in the questionnaire by individuals who do not possess a supermarket app on their mobile smartphones. In sequence, another filter question is used to remove respondents who did not make any purchase in a supermarket in the 30 days previous answering the survey.

Then, those who answered the previous two questions positively were asked a question regarding which apps they have and the recency, frequency and monetary value expenditures in purchases in the previous 30 days in the supermarkets that they have the apps. Subsequently, the section on measuring consumer attitudes towards supermarket purchases was composed by three subsections with four questions each, measuring in each sub-section respectively the perceptions of the respondents about the last purchase toward saving effort, getting the right product, saving time and saving money.

In the next part, there were questions about the receipt of push notifications from the supermarket apps and a list of the apps to choose from which they received the promotional notifications. The last part of the questionnaire included the identification of socio-demographic data of the respondents, such as gender, age, educational attainment, number of household constituents and monthly net income.

A detailed version of the structure can be consulted on the Appendix 1 and the survey itself is available on Appendix 2.

4.6. Measurement and Scales

The items presented to supermarket consumers that has installed in their mobile phones a branded app were intended to measure the constructs under study, as described on Table I. The constructs from recency, frequency and monetary value for RFM analysis used

in the survey, as well the construct of push notification were adapted from Buckinx & Poel (2005). Regarding the psychographic variables regarding the purchase process, the constructs used were in Likert-type importance/agreement scales, which were previously developed and tested by Atkins, Kumar, & Kim (2016). Further details are available on the Appendix 3.

TABLE I - Measurement Scales

Construct	Format	Reference Authors
Recency	Integer number (days)	Buckinx & Poel (2005)
Frequency	Integer number (days)	
Monetary Value	Rational number (monetary unit)	
Saving effort	Seven-points Likert (1 - Strongly Disagree and 7 - Strongly Agree)	Atkins, Kumar, & Kim (2016)
Right product		
Saving money		
Saving time		

Source: Own elaboration

4.7. Data Processing

The collected data analysis was analyzed after its collection was completed, with the help of computer-aided data analysis software, namely SPSS for descriptive and inferential statistical analysis, due to their quantitative nature.

The total number of answers obtained in the questionnaire was 554. However, only 265 are considered valid. A total of 221 responses were excluded because they did not belong to the study population (Malhotra *et al.*, 2012), from which 190 of the respondents did not have a supermarket app, and 31 of the respondents did not make a purchase in a supermarket in the 30 previous days. Others 68 incomplete answers were also removed from the data analysis (Malhotra *et al.*, 2012).

5. DATA COLLECTION, ANALYSIS AND DISCUSSION

5.1. Sample Characterization

The 265 users that completed the questionnaire and were considered valid and therefore consist the population sample, were analysed regarding their characterization, with more details on Appendix 5. Most respondents are female, consisting in 74.7% of the respondents, with the 25.3% identifying themselves as men. Regarding the age, the mean of

the respondents is 39.4 years old, that could be divided in quartiles between 20 and 31 years old (25.3%), 32 and 37 years old (25.3%), 38 and 48 years old (25.3%) and 48 to 65 years old (24.2%). On the marital status question, 67.9% of the respondents are married (54.7%) or cohabiting with another person as husband and wife (13.2%) and 32.1% of the respondents live alone, composed majorly by singles (22.6%) and divorced (7.2%).

With regard to the household, it is made up of three people in 22.6% of the cases, four people in 21.5% and five people in 19.6%. It is also noted that 8.3% of the respondents declare to be the sole constituent of the household. Regarding educational attainment, approximately 30.6% have studies at secondary level, 21.9% of respondents are graduates, 20.4% concluded postgraduate studies and 18.9% hold a master's degree. Finally, regarding the average gross income (monthly and individual), 30.2% are in the range between 501€ and 1000€, 21.1% between 1001€ a 1500€ and 17.4% that preferred not to answer.

5.2. Descriptive Analysis

5.2.1. Supermarket Branded Apps

Once the possession of a branded app of a Portuguese supermarket was a filter question, all the 265 valid answers possess at least one app, with an average of 1.84 app per respondent ($SD = 1.054$), and 51.3% have in their smartphones two or more supermarket branded apps. Regarding the receipt of promotional push notifications from these apps, 63,8% have received them from a supermarket branded apps, with an average of receipt from 1.33 apps ($SD = 0.643$). The distribution app possession per supermarket branded app, divided by the receipt or not of push notifications, is illustrated on Figure 2.

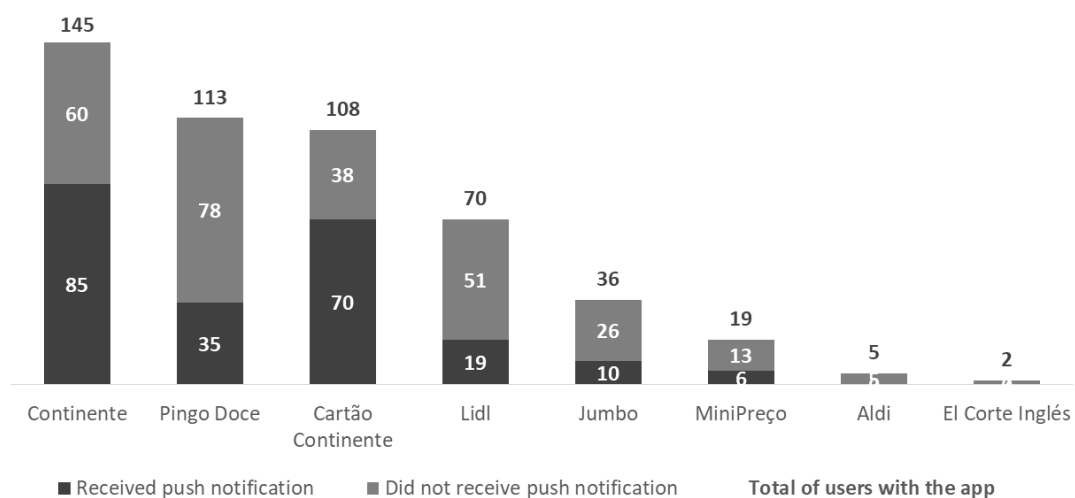


FIGURE 2 - Distribution of the supermarket branded apps possessed by respondents, divided by receipt or not of promotional push notifications

5.2.2. Purchase Behavior

All the 265 valid answers made a purchase on a supermarket from which they have an app in the previous 30 days of the survey, since it was a filter question on the survey. From them it is possible to see that people went in average more than 7 times in this time window ($M=7.72$, $SD=6.43$), where 24.2% went from one to three times, 23.8% went four or five times, 18.5% went from six to nine times and 33.6% went over ten times. About the recency of the last purchase, it was almost 4 days previous the answer of the survey ($M=4.29$, $SD=5.07$), with 53.6% of the answer with a recency of two days or less. Regarding the monetary value spent on these purchases, the average was of 146.50€ ($SD=113.13$), with 23.4% with expenditures up to 50€, 23.8% above 50€ until 110€, 32.5% above 110€ until 200€ and 20.4% above 200€.

5.2.3. Purchase Psychographic Attributes

The Table II summarize the level of agreement of the sample towards the psychographic attributes of the purchase process.

Analysing internet users' purchase psychographic attributes, the Saving Money category register the most opposite answers. The importance of having the best price had the dimension which registered higher levels of agreement ($M=5.92$, $SD=1,26$), meanwhile ableness of paying less than usual got the lowest level of agreement ($M=4.38$, $SD= 1.78$), meaning that was a difference between expectations and reality regarding the price of the products during the purchase. It was also verified that the attribute regarding purchasing the right product got the second to fourth highest levels of agreement, which indicates the importance of output of the purchase fulfil the needs of the users.

TABLE II - Level of agreement of the purchase psychographic attributes

Psychographic Attributes	Questions	Mean	Std. Deviation
Saving effort	Making this purchase was not a hassle.	5,44	1,61
	I didn't have to go out of my way to make this purchase.	5,20	1,69
	I did not have to spend extra effort to make this purchase.	5,28	1,56
Right product	I got all the products I wanted in this purchase.	5,55	1,47
	This purchase perfectly met my needs.	5,79	1,25
	I was able to buy exactly what I was looking for.	5,60	1,38
Saving time	I made this purchase as soon as I could.	5,49	1,40
	I wasted no time making this purchase.	5,15	1,57
	I was able to make this purchase quickly.	5,17	1,51
Saving money	I got the products I wanted at a price I was willing to pay.	5,35	1,38
	I was able to pay less for this purchase than I usually pay.	4,38	1,78
	It was important for me to have the best price for the products I wanted to buy.	5,92	1,26

5.3. Impact of the Push Notifications in the Purchase Behavior

Considering the constructs present in the proposed research model, and aiming to test the first three hypotheses formulated, it was conducted three Independent Sample T-test to analyse the impact of the push notifications sent via the supermarket branded apps on the purchase behavior. The Table III illustrates the differences of the RFM analysis based on the receipt or not of push notifications for different psychographic attributes.

The first one (H1), related to the frequency of purchase, there was no statistically significant difference ($t(263)=1,490$; $p=0,137$) in the total of visits to supermarket store between the people who received push notifications ($M=8.16$, $SD=7.01$) and who did not receive them ($M=6.94$, $SD=5.19$), therefore it is rejected.

Regarding the second hypothesis (H2), it was also found no statistically significant difference ($t(225,767)=0,700$; $p=0,485$) in the total of days past since the previous purchase on supermarket store between the people who received push notifications ($M=4.44$, $SD=5.36$) and who did not receive them ($M=4.01$, $SD=4.52$), which make it be also rejected.

About the hypothesis regarding monetary value of the expenses in supermarket purchase (H3), there is a statistically significant difference ($t(231,485)=3,848$; $p=0,000$) of 51.42 euros higher for the people who received push notifications ($M=165.13$, $SD=118.02$), compared to who did not receive them ($M=113.71$, $SD=96.07$).

TABLE III - Level of agreement of the purchase psychographic attributes

		Frequency (means - in days)			Recency (means - in days)			Monetary Value (means - in Euros)		
		Total Sample	With PN	Without PN	Total Sample	With PN	Without PN	Total Sample	With PN	Without PN
		N=256	n=169	n=96	N=256	n=169	n=96	N=256	n=169	n=96
Means		7,72	8,16	6,94	4,29	4,44	4,01	146,50	165,13	113,71
Demographic Characteristics										
Gender	Masculine	5,40	5,40	5,40	4,92	5,32	4,34	103,34	124,34	73,33
	Feminine	8,81	9,32	7,82	3,99	4,08	3,82	166,89	182,27	136,88
Age	20-31 years old	6,16	5,95	6,48	3,36	3,95	2,48	112,59	145,68	63,57
	31-37 years old	5,34	5,08	5,74	5,04	3,83	6,85	122,75	149,50	83,11
	30-35 years old	10,24	12,33	6,72	2,99	2,86	3,20	195,30	208,33	173,40
	48-65 years old	9,19	8,94	9,88	5,83	6,81	3,12	155,79	156,38	154,15
Academic Qualifications	High school or less	8,65	8,82	8,15	4,45	4,97	2,88	162,88	165,86	154,06
	Bachelor degree	7,88	8,27	7,30	3,87	4,24	3,33	142,38	171,61	100,44
	Postgraduate / Master / Doctorate	5,44	5,92	4,92	4,90	3,38	6,54	122,00	146,54	95,42
Monthly Gross Income	<=1000€	7,54	8,17	5,96	4,62	5,18	3,19	151,12	162,34	123,08
	1000€-1500€	5,73	4,87	6,73	4,70	6,13	3,04	149,85	140,20	160,98
	1500€-2000€	6,31	6,17	6,67	3,56	3,91	2,67	174,47	223,04	50,33
	>2000€	8,93	11,42	5,19	4,08	2,92	5,81	126,18	175,42	52,31
	Did not answered	10,41	10,59	10,16	3,83	2,59	5,58	131,52	141,08	117,93

5.4. Segmentation by Purchase Psychographic Attributes

5.4.1. Clustering process

To identify the segments of the respondents towards the psychographic attributes, it was replicated the strategy adopted by Atkins, Kumar, & Kim (2016). First, a principle component analysis with varimax rotation was employed, to generate the initial seed from the Ward method (hierarchical). As result, three clusters were identified as the best solution, by the use of squared Euclidean distance projected graphically, which determines the distance between clusters (Punj & Stewart, 1983), available on Appendix 6. After this procedure, the solution of three clusters was used to conduct a K-means procedure, a nonhierarchical cluster agglomeration procedure. The results are illustrated in the Table IV, containing the average perception for each questions and for the constructs of psychographic attributes, which reliability were tested using Cronbach's alpha coefficient, varying from 0,600 for the "Saving Time" construct to 0,902 for the "Right Product" construct, as listed on Appendix 4. The constructs have also been tested for correlation, where there was no strong correlation found, as listed on Appendix 7. More details about the socio-demographic characteristics of the clusters on Appendix 8.

TABLE IV - Clusters' Profile

Psychographic Attributes (means)		Total Sample	Cluster 1	Cluster 2	Cluster 3
		N=265	n=163	n=70	n=32
Saving effort	Making this purchase was not a hassle.	5,44	6,00	4,34	4,97
	I didn't have to go out of my way to make this purchase.	5,20	5,89	3,59	5,22
	I did not have to spend extra effort to make this purchase.	5,28	5,88	3,97	5,06
	Means	5,30	5,92	3,97	5,08
Right product	I got all the products I wanted in this purchase.	5,55	6,15	5,70	2,19
	This purchase perfectly met my needs.	5,79	6,25	5,89	3,28
	I was able to buy exactly what I was looking for.	5,60	6,12	5,54	3,13
	Means	5,65	6,17	5,71	2,86
Saving time	I made this purchase as soon as I could.	5,49	5,98	4,60	4,94
	I wasted no time making this purchase.	5,15	5,87	3,56	5,03
	I was able to make this purchase quickly.	5,17	5,80	4,10	4,28
	Means	5,27	5,88	4,09	4,75
Saving money	I got the products I wanted at a price I was willing to pay.	5,35	5,74	5,09	3,97
	I was able to pay less for this purchase than I usually pay.	4,38	4,99	3,63	2,94
	It was important for me to have the best price for the products I wanted to buy.	5,92	6,02	5,97	5,28
	Means	5,22	5,59	4,90	4,06

5.4.2. Cluster Analysis

The analysis identified three segments based on the supermarket shoppers behaviors: involved, product-oriented and apathetic shoppers.

"The Involved Shopper" (Cluster 1): this segment is responsible for 62% of the answers and show in terms of psychographic attributes higher values in all the attributes,

compared with the average, with a highlight to the category “Right Product” (M=6,17), the only one where all the questions has an average above six in a scale of accordance from one to seven. At the same time, it is the cluster with the highest percentage of women, of people above the 48 years old and with a bachelor degree and is the cluster with the highest share of people with a monthly gross income up to 1.000 euros.

“The Product-oriented Shopper” (Cluster 2): consisted by 26% of the answers, this segment has as principal attribute the higher rates attributed to the questions of the category “Right Product” (M=5,71) when compared to the average (M=5,65), with the other three categories showing results below the average in all the questions. Demographically, it is slightly above the average in the feminine gender, the highest share of people between 31 and 37 years old and the highest share of people with a monthly gross income over the value of 1.000 euros.

“The Apathetic Shopper” (Cluster 3): the smallest cluster with 12% of the answers contains the answers below the average in all the psychographic attributes questions inquired, with the lowest answers in the “Right Product” category. This is the cluster with the highest percentage of males and almost composed in its majority by people under 31 years and of people with high school or less as academic qualifications.

5.4.2. Impact of the Clusters in the Purchase Behavior

With the clusters calculated, in order to validate hypotheses H4a, H4b and H4c, several Mann-Whitney U-test was performed, once the clusters do not have a normal distribution (K-S=0,348; p=0,000). Being the dependent variable the Purchase Psychographic clusters and as independent variables the appear the recency, frequency and monetary value of the purchases in supermarkets. In addition to the provisions of this section, more detailed information can be found in Table V.

Analysing the value of the results, it can be concluded that once there is no statistical significance in the differences between the results in Frequency and Recency of the purchases in any of the clusters, H4a and H4b are rejected.

However, there is statistical significance on the effect of the Monetary Value of the clusters 1 (of 35,45 euros) and 2 (of 67,88 euros), when comparing the answers of who received push notifications from supermarket apps to who did not receive them, which

partially confirm the hypothesis H4c, once this effect is not statistical significance to the Cluster 3.

TABLE V - Purchase behavior per cluster of Purchase Psychographic Attributes

		Cluster 1		Cluster 2		Cluster 3	
		With PN n=107	Without PN n=56	With PN n=47	Without PN n=23	With PN n=15	Without PN n=17
Frequency	Mean (days)	8,83	7,20	6,68	5,70	8,00	7,76
	Mann-Whitney U-test	(U=2507; z=-1,730; p=0,084)		(U=498,5; z=-0,530; p=0,596)		(U=230,5; z=0,511; p=0,526b)	
Recency	Mean (days)	4,51	4,50	4,89	4,22	2,53	2,12
	Mann-Whitney U-test	(U=2711; z=-1,013; p=0,311)		(U=500,5; z=-0,505; p=0,614)		(U=225,5; z=0,371; p=0,411b)	
Monetary Value	Mean (euros)	156,23	120,79	187,45	119,57	158,67	82,47
	Mann-Whitney U-test	(U=2355; z=-2,245; p=0,025)		(U=370; z=-2,156; p=0,031)		(U=233; z=0,071; p=0,076b)	

b. Not corrected for ties.

5.5. Discussion

For this research, it was formulated three research questions with the formulation of four hypotheses. The first question is related to the existence of a relationship between the receipt of push notifications from supermarket branded apps and the purchase behavior in terms of RFM variables. The findings of this study indicate that, contrary to expectations, promotional push notifications did not show averages with significative statistical differences between the recipients and not recipients, regarding the average time of recency of the last purchase and the average of the frequency of purchases, which rejects both H1 and H2 hypothesis. However, push notifications from supermarket branded apps were confirmed to increase the average purchase amount per transaction (monetary value) in comparison to who did not receive them in 45.22%, which allow to accept the H3 hypothesis and confirm that push notifications influence the purchase behavior of buyers in terms of total expenditure.

This conclusion, although applied in the mobile push context, is following previous results obtained in the context of direct marketing. Lee & Gopal (2016) found that push notifications lead to reasonably larger sales effect of targeted products. Gázquez-Abad *et al.* (2011), with direct mailing, found that promotional mailings work well in the short term results of total expenditure, once they are more opportunistic in seeking a short-term response. Park, Park, & Schweidel (2018) found an increase of expenditure of 9.5% with

promotional coupons sent via message services (SMS) on the mobile phones of customers, compared to the expenditure of who did not receive them.

This effect of increasing the expenditure can be explained because the consumer–brand communication does not occur in a vacuum while using a branded app, but within a certain context or environment that influences cognitive and affective brand responses (Noort & Reijmersdal, 2019). By voluntarily and deliberately downloading and installing the app, these users already indicated that they appreciate their relationship with the brand, so branded apps advertising are welcomed as “useful,” which positively affects the purchases made (Bellman *et al.*, 2011; Peng, Chen, & Wen, 2014; Noort & Reijmersdal, 2019).

Moreover, previous positive experience with a retailer leads to more positive attitudes, what make consumers more likely to rely on the information shared by the brand, and thus increases the likelihood of response to promotional marketing activities, which includes promotional direct marketing campaigns (Kopalle & Lehmann, 1995; Gázquez-Abad *et al.*, 2011). In the mobile environment, the promotional push notifications is a form of direct marketing that calls the attention of customers, what leads to a remarkably high effect on customers engagement with the brand and purchase intention, which lead to a reasonably significant sales effect (Lee & Gopal, 2016).

Regarding the second research question, by adapting the survey questions and using the clusterization strategy of Atkins, Kumar, & Kim (2016), this research was able to find two clusters similar to these authors research. One of them is “The Involved Shopper” (Cluster 1), which also scored the highest of the three segments in all the purchase psychographic attributes, being “getting the right product” the construct that also had the highest average among the four constructs.

Another cluster is “The Apathetic Shopper” (Cluster 3), which similarly shown the lowest in all the purchase psychographic attributes when compared to the other two clusters, but in the original study the construct “saving time” was the one with the lowest average, instead of “right product” construct.

“The Product-oriented Shopper” (Cluster 2) did not found resonance with the work of Atkins, Kumar, & Kim (2016), by presenting all the purchase psychographic attributes below the average but the “getting the right product” construct, although, like the original research, has also shown medium mean values on all four of the characteristics when compared with the other two clusters.

The distinguish factor that “getting the right product” construct had on the definition of the clusters is important because groceries are typically considered convenience goods that involve minimal time or effort. A high mean for this construct may suggest that this consumer segment perceives a much higher utilitarian and hedonic risks in the shopping motives, which make users more willing to put forth more effort in the purchase process (Atkins, Kumar, & Kim, 2016; Kim, Libaque-Saenz, & Park, 2018). Furthermore, this information-processing and uncertainty-reduction motivation can be configurations of a webrooming behavior (Santos & Gonçalves, 2019), by searching information in the online mobile app previous the purchase on offline stores.

Intending to answer the third research question, it was investigate the effect of these three clusters, defined on previous step, on the RFM variables of supermarket purchases. Regarding the frequency and recency of the last purchase, it was not found any cluster with significant statistical differences between who receives and who did not receive promotional push notifications from supermarket branded apps, which leads to the rejection of the hypothesis H4a and H4b.

Concerning the monetary value spent on purchases, even though in H3 it was found that push notifications increase the total spent, this effect was observed only in the Cluster 1 (Involved Shopper) in 29% (35,45€), and in the Cluster 2 (Product-oriented Shopper) by 57% (67,88€), which leads to a partial acceptance of the hypothesis H4c, once there was no statistically significant difference for Cluster 3 (Apathetic Shopper).

Although it has been affirmed by Gázquez-Abad *et al.* (2011) and Vafainia, Breugelmans, & Bijmolt (2019) that there is a heterogeneity on the response of customers to direct marketing, there is no academic research that has analyzed the effect of push notifications and psychographic attributes on purchase behavior, to the best of the knowledge of the investigator, what made not possible any comparison with the findings of this study. However, this result could be explained by the fact that branded apps increase interest in the brand and product categories, consequently on-brand responses and subsequent spending on a brand (Noort & Reijmersdal, 2019). Moreover, this positive brand response does not appear to the “apathetic” cluster, by showing significant lowest values in terms of post purchase evaluations, especially towards the satisfaction (Atkins, Kumar, & Kim, 2016).

6. CONCLUSIONS, LIMITATIONS AND FUTURE RESEARCH

6.1. Conclusion

Given the identified gaps in the literature about mobile app push notifications as a direct marketing channel, this investigation attempted to explain the effect promotional marketing campaigns with this channel on the purchase behavior, with the goal of gaining a richer understanding on this topic and providing advertising practitioners with insights that may help them to have better expectations towards the results by using this channel. The findings of this study indicate that promotional push notifications sent via supermarket branded apps increase the expenditure in purchases in these supermarkets.

Regarding the clusters of purchase psychographic attributes, by exploiting a nationwide non-representative sample of the Portuguese population that have a branded app from a supermarket retailer, this investigation identified three supermarket shopper segments in terms of post purchase evaluations, with significant differences existing among them. In addition, it was identified that only two segments of purchase psychographic attributes show the increased expenditure. In summary, promotional push notification from branded apps proved to be a relevant MDM channel to influence purchase behavior.

In the Portuguese supermarket industry environment, where almost all purchases are made offline (Kantar, 2019), the usage of supermarket mobile branded apps consists of a webrooming action, once follows the definition of previous online interaction with a product and decision at the physical store (Flavián, Gurrea, & Orús, 2016). And excluding this uninvolved shoppers profile, the other customers clusters that reveal favorable attitudes toward multiple channels for search and purchase, which means they have a tendency to use the Internet-based channels for information search, and to have favorable attitudes toward companies that have a physical presence and offer face-to-face customer experiences, which includes supermarkets (Konus *et al.*, 2008).

These users that are motivated to adopt store-focused behavior are more likely to use mobile devices (e.g., smartphones, tablets) than stationary devices (e.g., desktops) when searching for information online (Kim, Libaque-Saenz, & Park, 2018), and push notifications represent a relevant tool to draw the attention of the mobile app device users (Shankar *et al.*, 2016).

6.2. *Theoretical Contributions*

From an academic point of view, this research provided meaningful insights that diminish existing gaps in the literature and contribute to the discussion regarding mobile marketing, by being the first, to the investigator's knowledge, to investigate the effect of push notifications from branded apps for different psychographic segments.

The results obtained from the data gathered were able to acknowledge the significant importance of direct marketing in the short-term user responses on the value spent on purchases (Gázquez-Abad *et al.*, 2011; Kannan & Li, 2017; Park, Park, & Schweidel, 2018). Moreover, building over the concept of push notification from mobile apps as a direct marketing channel (Ström, Vendel, & Vendel, 2014; Lachner *et al.*, 2017), the results allow to acknowledge the effectivity of this marketing channel to drive positive financial results by affecting the customers' purchase behavior.

Additionally, in the context of branded apps, this research was able to measure effectively the increase of the spending levels generated by usage of mobile app previously described on the literature (Peng, Chen, & Wen, 2014; Shankar *et al.*, 2016; Steinhoff *et al.*, 2018; Noort & Reijmersdal, 2019), with push notifications driving the attention of users to the branded app that they already have on their smartphones.

The research was also helped to answer the call for further researches of Kannan & Li (2017) and Vafainia, Breugelmans, & Bijmolt (2019) on the moderating effects of customer characteristics on the effect of direct marketing communications at the different stages of the conversion funnel, by acknowledging the effect of different psychographic profiles of the customers in the purchasing phases (Vriens *et al.*, 1998; Konus *et al.*, 2008; Atkins, Kumar, & Kim, 2016; Lee & Gopal, 2016).

Finally, the different levels of concern regarding "getting the right product" in the clusters was found to generate different results in the value spent on supermarket purchases, confirming that grocery consumers are willing to put forth more effort and are more interested in brand names than ever before (Atkins, Kumar, & Kim, 2016).

6.3. *Managerial Implications*

Mobile apps provide marketing opportunities that can be delivered via a platform which consumers have strong emotional attachments. This fact led to a rush into the marketplace by many brands looking to capitalize on the experience that apps provide (Bellman *et al.*, 2011). Once channel-consumer interactions occur within the domain of a

marketer's control, marketers can influence these consumer–channel interactions (Dholakia *et al.*, 2010) by providing information on new collections, personalized offers and deals (Pantano & Priporas, 2016).

Since push notifications are increasingly becoming commonplace to trigger the attention of the customers (Lee & Gopal, 2016), this investigation offers meaningful insights that may be of interest to practitioners, specially companies that already use or wish to use as a direct marketing channel to interact with the audience that possess their branded apps. Although acknowledging that there was no effect on frequency or recency of purchases on this research, practitioners must be aware of the potential of increasing sales in the average value of purchases with push notifications from the branded app users.

As suggested by Lachner *et al.* (2017), in contrast to other direct marketing tools, push notifications have the possibility to draw the attention of the customers with temporal and location-specific campaigns. This is particularly important in the webrooming context of grocery retail, where marketers can use online push notifications to drive these users to offline purchases, considering a user moving to an area near to a supermarket store or considering the offers available in the supermarket store nearest to the user.

Companies should also have in consideration that the success of such push notifications campaigns depends on an ever better understanding of consumers variables (Grewal, Bart, Spann, & Zubcsek, 2016), and different segments of customers may require unique marketing strategies (Atkins, Kumar, & Kim, 2016). This research was successful in showing that not all customers segments presents the same reaction to promotional branded push notifications in terms of total expenditure in purchases, even though they possess a branded app, which is supposed to make the existing bond between the consumers and the brand stronger (Peng, Chen, & Wen, 2014).

Besides the fact that an increase of monetary value in expenses in groceries is seen with push notifications on the “involved cluster” and “product-oriented cluster” in the data collected, the second clusters is less likely than the first to respond to promotional marketing campaigns that emphasizes the aspects of saving money, saving time and saving effort. Moreover, the “apathetic cluster” seems not to respond also to the emphasizes on promotional messages about getting the right product, what indicates the need for marketers of using other types of segmentation to identify the reasons that would trigger a user response to a push notification.

These results exemplify the need of marketers to not reach customers all-at-once with the same message, which can be considered intrusive or irrelevant, and therefore ignored. In fact, marketers need to tailor the push notifications according to segmentations created based on socio-demographic, psychographic, purchase and online behavioral variables, targeting them with different marketing campaigns, such as push notifications, that better answer their needs, which likely enhances their ability to influence the purchase behavior of consumers with mobile devices (Lachner *et al.*, 2017).

6.4. Limitations and Future Research

This research has acknowledged several limitations, which limit the applicability of its results. Firstly, the sampling method adopted is the non-probabilistic, mainly purposive heterogeneous sampling, indicate selection bias and less representativeness, which means that the findings are neither generalizable to the entire population of Portuguese app users, nor to supermarket branded apps users of other countries. Since the sampling involve only the Supermarket industry, the results are not generalizable to other industries, what make interesting investigations to understand the dissimilarity of purchasing behavior among other business sectors and in other markets.

Secondly, the data collection methodology is characterized by a unique method, notably quantitative, which consists limitation. A qualitative collection, such as in-depth interviews or focus groups with consumers, could give a better understanding of the clusters found, their effect on the purchase behavior and bring results that are more reliable.

Thirdly, since this study uses a cross-sectional strategy, the results are limited to a short-term perspective of the effect of the promotional push notifications. Once the existing literature indicates that promotional direct marketing results can vary in a long-term perspective, future research with a longitudinal perspective could address this limitation.

Finally, this research does not acknowledge the effect of other marketing strategies that the consumers may also received through many devices together with push notifications from the supermarket brands analyzed, in the same time window used for this research, which could also stimulate purchases. Further investigations are needed to understand if the combination of push notifications with other forms of marketing strategy would enhance or not the purchase behavior effects found on this research, especially with others MDM channels. These findings would allow marketers to design adequate promotional campaigns in a omni-channel environment with a higher accuracy.

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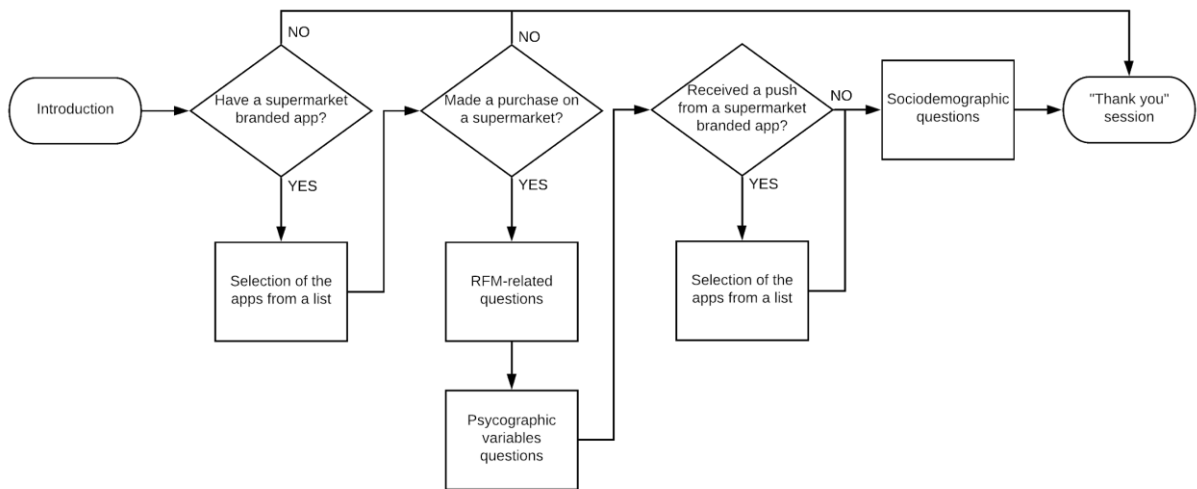
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APPENDICES

Appendix 1. Survey Structure



Appendix 2. Online Survey

Section 1. Introduction

O presente questionário insere-se no âmbito da realização de um trabalho final de Mestrado em Marketing no ISEG - Instituto Superior de Economia e Gestão da Universidade de Lisboa. O questionário demora apenas cerca de 5 minutos a preencher. Todas as respostas coletadas são anónimas e serão usadas exclusivamente para este estudo.

Agradeço antecipadamente pela colaboração.

Section 2. Possession of Branded Apps

Q1. Você possui a aplicação de algum supermercado em seu telemóvel?

Sim (1) / Não (2)

Q2. Quais destas aplicações de supermercados você possui?

Continente (1) / Cartão Continente (2) / Lidl (3) / Pingo Doce (4) / Jumbo (5) / MiniPreço / (6) / Aldi (7) / Outros (8)

Section 3. Supermarket purchases

Q3. Você fez nos últimos 30 dias uma compra em um supermercado do qual possui a app?

Sim (1) / Não (2)

Q4. Qual o número de vezes você foi a este supermercado nos últimos 30 dias?

Q5. Há quantos dias foi a sua última visita neste supermercado?

Q6. Qual foi o valor gasto total em euros neste supermercado nos últimos 30 dias?

Section 4. Psychographic Attributes - Saving Effort

Q7. Referente a sua última compra neste supermercado do qual possui uma app, indique seu grau de concordância.

	Discordo totalmente (1)	Discordo (2)	Discordo parcialmente (3)	Nem concordo nem discordo (4)	Concordo parcialmente (5)	Concordo (6)	Concordo totalmente (7)
Fazer esta compra não foi um aborrecimento. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eu não tive que desviar do meu caminho para fazer essa compra. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eu não tive que gastar um esforço extra para fazer essa compra. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Section 5. Psychographic Attributes - Getting the Right Product

Q8. Referente a sua última compra neste supermercado do qual possui uma app, indique seu grau de concordância.

	Discordo totalmente (1)	Discordo (2)	Discordo parcialmente (3)	Nem concordo nem discordo (4)	Concordo parcialmente (5)	Concordo (6)	Concordo totalmente (7)
Eu consegui todos os produtos que eu desejava nesta compra. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Esta compra atendeu perfeitamente às minhas necessidades. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eu consegui comprar exatamente o que eu estava procurando. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Section 6. Psychographic Attributes - Saving Time

Q9. Referente a sua última compra neste supermercado do qual possui uma app, indique seu grau de concordância.

	Discordo totalmente (1)	Discordo (2)	Discordo parcialmente (3)	Nem concordo nem discordo (4)	Concordo parcialmente (5)	Concordo (6)	Concordo totalmente (7)
Eu fiz essa compra o mais rápido que pude. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eu não perdi tempo fazendo essa compra. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eu consegui fazer essa compra rapidamente. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Section 7. Psychographic Attributes - Saving Money

Q9. Referente a sua última compra neste supermercado do qual possui uma app, indique seu grau de concordância.

	Discordo totalmente (1)	Discordo (2)	Discordo parcialmente (3)	Nem concordo nem discordo (4)	Concordo parcialmente (5)	Concordo (6)	Concordo totalmente (7)
Eu consegui os produtos que queria a um preço que estava disposto a pagar. (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eu consegui pagar um valor menor nesta compra do que costumo pagar. (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Era importante para mim ter o melhor preço para os produtos que queria comprar. (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Section 8. Push Notifications Receipt

Q10. Você recebeu alguma mensagem promocional enviada por uma destas aplicações de supermercado nos últimos 6 meses? (Não considerar mensagens promocionais enviadas por SMS ou por email).

Sim (1) / Não (2)

Q11. De quais destas aplicações de supermercados você recebeu uma mensagem promocional nos últimos 6 meses?

Continente (1) / Cartão Continente (2) / Lidl (3) / Pingo Doce (4) / Jumbo (5) / MiniPreço / (6) / Aldi (7) / Outros (8)

Section 9. Demographic Information

Informe, por favor, alguns dados pessoais.

Q12. Sexo.

Masculino (1) / Feminino (2)

Q13. Idade (em anos)

Q14. Estado civil

Solteiro(a) (1) / Casado(a) (2) / Viúvo(a) (3) / Divorciado(a) (4) / União de facto (5) / Prefiro não informar (6)

Q15. Número de pessoas que fazem parte do seu agregado familiar.

0 (Moro sozinho) (1) / 1 (2) / 2 (3) / 3 (4) / 4 (5) / 5 ou mais (6)

Q16. Nível de escolaridade.

Sem nível de escolaridade (1) / Básico - 1º ciclo (2) / Básico - 2º ciclo (3) / Básico - 3º ciclo (4) / Secundário e pós-secundário (5) / Superior (6) / Pós-graduação (7) / Mestrado ou superior (8)

Q17. Rendimento bruto (mensal e individual).

Até 500€ (1) / 501€ a 1000€ (2) / 1001€ a 1500€ (3) / 1501€ a 2000€ (4) / 2001€ a 3000€ (5) / 3001€ a 5000€ (6) / 5001€ ou mais (7) / Prefiro não informar (8)

Appendix 3. Original and Adapted Scales of Measurements

Reference Authors	Constructs	Original items	Adapted items
Buckinx & Poel (2005)	Recency	Number of days since last shop incidence.	Há quantos dias foi a sua última visita neste supermercado?
	Frequency	Number of shop visits during last month.	Qual o número de vezes você foi a este supermercado nos últimos 30 dias?
	Monetary Value	Total monetary amount of spending.	Qual foi o valor gasto total em euros neste supermercado nos últimos 30 dias?
Atkins, Kumar, & Kim (2016)	Saving effort	Making this purchase was not a hassle.	Fazer esta compra não foi um aborrecimento.
		I did not go out of my way to make this purchase.	Eu não tive que desviar do meu caminho para fazer essa compra.
		I did not spend extra effort on this purchase.	Eu não tive que gastar um esforço extra para fazer essa compra.
	Getting the right product	This purchase was exactly what I was looking for.	Eu consegui comprar exatamente o que eu estava procurando.
		This purchase perfectly fit my needs.	Esta compra atendeu perfeitamente às minhas necessidades.
		I have gotten everything I expected from this purchase.	Eu consegui todos os produtos que eu desejava nesta compra.
	Saving money	In making this purchase, I got what I wanted at a price I was willing to pay.	Eu consegui os produtos que queria a um preço que estava disposto a pagar.
		I got a lower price on this purchase than normal.	Eu consegui pagar um valor menor nesta compra do que costumo pagar.
		I got a reasonable price on this purchase.	Era importante para mim ter o melhor preço para os produtos que queria comprar.
	Saving time	I made this purchase as quickly as I could.	Eu fiz essa compra o mais rápido que pude.
I didn't waste time making this purchase.		Eu não perdi tempo fazendo essa compra.	
I was able to make this purchase quickly.		Eu consegui fazer essa compra rapidamente.	

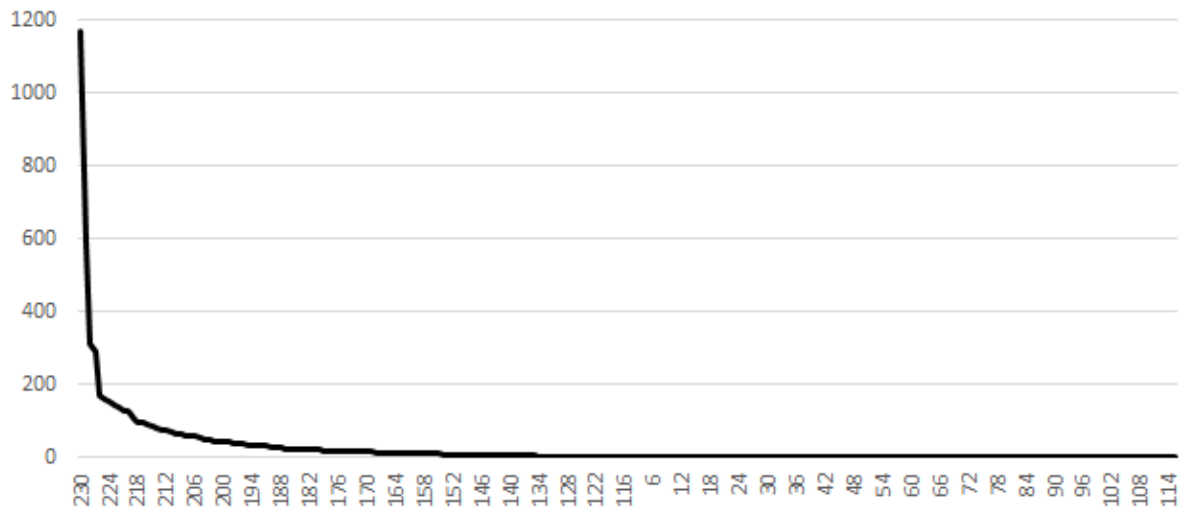
Appendix 4. Descriptive Statistics, Creation of Dimensions and Principal Component Analysis

Constructs	Original items	N	Minimum	Maximum	Mean (M)		Std. Deviation (SD)		Cronbach's Alpha
					Item	Construct	Item	Construct	
Recency	Number of days since last shop incidence.	265	1	30	7,72	-	41,36	-	-
Frequency	Number of shop visits during last month.	265	0	30	4,29	-	25,71	-	-
Monetary Value	Total monetary amount of spending.	265	1,35	500,00	146,50	-	12.798,03	-	-
Saving effort	Making this purchase was not a hassle.	265	1	7	5,4	-	2,6	-	-
	I did not go out of my way to make this purchase.	265	1	7	5,2	5,3	2,8	1,2	0,679
	I did not spend extra effort on this purchase.	265	1	7	5,3	-	2,4	-	-
Getting the right product	This purchase was exactly what I was looking for.	265	1	7	5,6	-	2,2	-	-
	This purchase perfectly fit my needs.	265	1	7	5,8	5,7	1,6	1,3	0,902
	I have gotten everything I expected from this purchase.	265	1	7	5,6	-	1,9	-	-
Saving money	In making this purchase, I got what I wanted at a price I was willing to pay.	265	1	7	5,5	-	1,9	-	-
	I got a lower price on this purchase than normal.	265	1	7	5,2	5,3	2,5	1,3	0,722
	I got a reasonable price on this purchase.	265	1	7	5,2	-	2,3	-	-
Saving time	I made this purchase as quickly as I could.	265	1	7	5,4	-	1,9	-	-
	I didn't waste time making this purchase.	265	1	7	4,4	5,2	3,2	1,1	0,600
	I was able to make this purchase quickly.	265	1	7	5,9	-	1,6	-	-

Appendix 5. Sample's Characterization

Per supermarket branded app			Sociodemographic				
		n	%	n	%		
Continente	Without push notifications	85	32,08	Gender	Masculine	67	25,28
	With push notificatios	60	22,64		Feminine	198	74,72
	Total	145	54,72	Age	20-31 years old	67	25,28
Cartão Continente	Without push notifications	70	26,42		31-37 years old	67	25,28
	With push notificatios	38	14,34		30-35 years old	67	25,28
	Total	108	40,75		48-65 years old	64	24,15
Lidl	Without push notifications	19	7,17	Civil Status	Single, divorced or widow	85	32,08
	With push notificatios	51	19,25		Married or unmarried couples	180	67,92
	Total	70	26,42	Academic Qualifications	High school or less	103	38,87
Pingo Doce	Without push notifications	35	13,21		Bachelor degree	112	42,26
	With push notificatios	76	28,68		Postgraduate/Master/Doctorate	50	18,87
	Total	111	41,89	Household	0 (Live alone)	22	8,30
Jumbo	Without push notifications	10	3,77		1	49	18,49
	With push notificatios	16	6,04		2	60	22,64
	Total	26	9,81		3 or more	134	50,57
MiniPreço	Without push notifications	6	2,26	Monthly Gross Income	<=1000€	91	34,34
	With push notificatios	13	4,91		1000€-1500€	56	21,13
	Total	19	7,17		1500€-2000€	32	12,08
Aldi	Without push notifications	0	0,00		>2000€	40	15,09
	With push notificatios	5	1,89	Did not answered	46	17,36	
	Total	5	1,89				
El Corte Inglés	Without push notifications	0	0,00				
	With push notificatios	2	0,75				
	Total	2	0,75				

Appendix 6. Distance between Agglomeration Coefficients (Ward's Method)



Appendix 7. Correlation among constructs of Psychographic Attributes

Pearson Correlation	Saving effort	Getting the right product	Saving money	Saving time
Saving effort	1	,195**	,388**	,191**
Getting the right product		1	,293**	,385**
Saving money			1	,296**
Saving time				1

** . Correlation is significant at the 0.01 level (2-tailed).

Appendix 8. Cluster distribution per sociodemographic variables

		Total Sample N=265	Cluster 1 n=163	Cluster 2 n=70	Cluster 3 n=32
Gender	Masculine	25,3%	22,7%	24,3%	40,6%
	Feminine	74,7%	77,3%	75,7%	59,4%
Age	20-31 years old	25,3%	22,7%	21,4%	46,9%
	31-37 years old	25,3%	20,2%	31,4%	37,5%
	30-35 years old	25,3%	27,0%	27,1%	12,5%
	48-65 years old	24,2%	30,1%	20,0%	3,1%
Academic Qualifications	High school or less	38,9%	36,2%	41,4%	46,9%
	Bachelor degree	42,3%	48,5%	35,7%	25,0%
	Postgraduate/Master/Doctorate	18,9%	15,3%	22,9%	28,1%
Monthly Gross Income	<=1000€	34,3%	35,6%	34,3%	28,1%
	1000€-1500€	21,1%	22,1%	14,3%	31,3%
	1500€-2000€	12,1%	14,1%	12,9%	0,0%
	>2000€	15,1%	12,3%	20,0%	18,8%
	Did not answered	17,4%	16,0%	18,6%	21,9%

