

Beyond the First Touchpoint: How Initial Engagement, Marketing Communication, and Store Proximity Shape Multichannel Purchasing

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ABSTRACT

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In the evolving retail landscape, companies embrace multichannel retailing to address consumer needs. Central to this discussion is the initial purchasing channel's impact on multichannel engagements, which is complexified by the influential role of marketing communication methods (i.e., mail and email) and store proximity. This study focuses on a multinational consumer packaged goods company operating online and physical stores in Quebec, Canada. It explores two research questions: (1) how does a consumer's initial offline engagement impact total purchases in different channels? (2) how do communication methods and store proximity impact the relationship between the initial offline engagement and total purchases in different channels? The study focuses on the total quantity of products purchased for a specific category in online and offline channels. First, the findings suggest how consumers who first engage offline tend to make 92.88% fewer online purchases and 948.56% more offline purchases than consumers who first engage online. Second, for consumers who first engage offline, being on the direct mailing list may mitigate the decline in online purchases while potentially mitigating the increase in offline purchases. Third, for consumers who first engage offline, being on the email list may mitigate the decline in online purchases while potentially mitigating the increase in offline purchases. Fourth, for consumers who first engage offline, store proximity may amplify the decline in online purchases while potentially amplifying the increase in offline purchases. This study contributes to the existing knowledge of multichannel purchasing behavior, offering insights for retailers navigating the world of multichannel retailing.

Key Words: multichannel retailing, initial purchasing channel, marketing communication strategies, store location proximity

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1. Introduction

A survey conducted by McKinsey & Company (2019) reveals that 60% of shoppers in key markets—including Germany, the United Kingdom, and the United States—exhibit multichannel purchasing habits, navigating between online and offline platforms. Additionally, in a comprehensive study of over 40,000 customers published in the Harvard Business Review, those who engage in multichannel purchases spend on average 4% more in physical stores and 10% more online compared to single-channel users (Sopadjieva et al., 2017). The strong presence of multichannel purchasing signifies the importance for retailers to adapt their strategies to resonate with changing consumer preferences and to increase their revenues.

As defined by Liu et al. (2018), multichannel retailing is the strategic practice of selling products through various sales channels. This approach has evolved from an innovative choice to an indispensable staple for business success in a competitive landscape. Notably, companies such as Amazon, Google, and Warby Parker, who are renowned for their digital presence, expanded into the brick-and-mortar world, opening their first physical stores between 2013 and 2021 (Howland, 2022; Lindsey, 2015; Ross & Allen, 2021). Furthermore, in 2017, Costco, a retail giant known for its physical warehouses, made a strategic shift by venturing into e-commerce (Bhattacharai, 2017). Modern companies are thus faced with the complex task of seamlessly merging their sales platforms to provide a unified, efficient shopping journey, catering to the needs of consumers and enhancing overall brand interaction.

At the heart of this discussion is the crucial nature of the initial purchasing channel, which acts as the springboard for a consumer's retail journey and significantly dictates future multichannel engagements and buying choices with the brand (Ainsworth & Foster, 2017; Bell et al., 2017; Flavián et al., 2016; Sen et al., 2023). This initial touchpoint, whether in a physical storefront or online, is pivotal in molding consumers' loyalty to a brand, thus calling for a calculated focus on enhancing multichannel retail strategies.

This narrative is complexified by the influential role of marketing communication methods in the multichannel retail framework, mainly through direct mail and email campaigns. These modes of communication transcend their traditional informative functions, actively shaping consumer perceptions, inclinations, and purchasing habits (Mark et al., 2019; Merisavo & Raulas, 2004; Pulcinella, 2017; Valenti et al., 2023). Therefore, devising effective communication strategies requires an intricate understanding of the consumer's journey, ensuring personalized and influential interactions at every stage.

Furthermore, even with the rapid surge in retail digitalization, the location of physical stores still holds considerable influence over consumers' choices. Consumers' purchasing decisions are influenced by the opportunity to examine products in stores physically, engage socially, benefit from a straightforward return process, and avoid shipping fees (Balasubramanian et al., 2005; Forman et al., 2009; Huang and Bronnenberg, 2022; Zhang et al., 2022). Consequently, the strategic placement of these stores, working in tandem with digital platforms, is critical in maintaining a balanced and robust multichannel retail framework.

Building on existing research, this study delves deeply into two primary research questions: (1) how does a consumer's initial offline engagement impact total purchases in different channels? (2) how do communication methods and store proximity impact the relationship between the initial offline engagement and total purchases in different channels?

This research focuses on a multinational consumer packaged goods corporation company that operates online and physical stores in Quebec, Canada. By analyzing a dataset that includes purchases from over 100,000 consumers, we delve into the forces that shape consumer interactions and brand engagement. Essential variables under consideration include

the initial purchasing channel (i.e., online or offline), communication strategies (i.e., customers part of the direct mail or email distribution lists), store location proximity (i.e., within an hour's drive or more than an hour's drive), language preference (i.e., English or French), and the number of products purchased through each channel by each customer.

Our research unveils several key insights. First, we identify a clear impact of the initial purchasing channel on future consumer purchasing habits. In digital realms, consumers who first engage offline tend to make significantly fewer online purchases than consumers who first engage online, showing a decrease of 92.88%. In contrast, in physical storefronts, an initial offline engagement correlates with a considerable increase in offline purchases than consumers who first engage online, with a rise of 948.56%.

We then turn our focus to the effects of direct mail communications. In digital channels, using direct mail communications mitigates the decline in online purchases usually seen after an initial offline engagement. In physical storefronts, direct mail communications seem to mitigate the increase of in-store purchases that often follow an initial offline engagement.

In tandem, we assess the influence of email communications. In the context of online channels, our findings suggest that email communications can mitigate the negative impact of initial offline engagement on online purchases. In the offline context, email communications seem to mitigate the positive trend between initial offline engagement and total in-store purchases.

Additionally, we consider the moderating role of store proximity. Our analysis indicates that store proximity (i.e., customers within an hour's drive) can strengthen the negative impact of initial offline engagement on online purchases. For offline channels, it appears to strengthen the positive influence between an initial offline engagement and in-store purchases.

Our study substantially contributes to the existing body of knowledge on multichannel purchasing behavior, offering a more nuanced view of the relationship between initial purchasing channels and total purchases in different channels—a relationship that previous studies have often simplified. We challenge conventional marketing paradigms by highlighting the significant moderating effects of direct mail and email communications, suggesting that these tactics can profoundly shift consumer behavior trends established by initial channel engagements. Furthermore, by highlighting the enduring importance of physical store locations in the digital age, our research brings added insight to the comprehension of consumer behavior within multichannel purchasing.

From a pragmatic perspective, our insights are invaluable for retailers navigating the complex world of multichannel retailing. By underlining the substantial effect of the initial purchasing channel on future consumer decisions, we advocate for the development of targeted strategies that cater to consumers based on their entry point, thereby potentially improving engagements across both digital and physical platforms. For instance, recognizing that a consumer whose initial purchase is offline is less likely to purchase as much in online channels can prompt the development of targeted strategies to encourage online engagement, such as exclusive online discounts (Winkler & Lockhart, 2022), digital loyalty programs (Dorotic, 2019), and personalized recommendations based on previous purchases (Basu, 2021). Our revelations regarding the moderating influence of different types of communications push for personalized, channel-specific strategies. Additionally, companies should entice consumers to be on the direct mail and email distribution lists to potentially reach a wider audience, increase multichannel purchases, and increase revenues. The importance of store proximity emphasizes the need for a cohesive online-offline strategy, leveraging tactics such as buy-online-pickup-in-store, ship-to-customer, and buy-online-and-return-in-store services (Gallino & Moreno,

2014; Rankin, 2022; Huang & Jin, 2020). These insights provide retailers with crucial strategic instruments for maximizing consumer engagement and nurturing brand loyalty in a competitive multichannel landscape.

2. Literature Review and Hypotheses Development

As the retail landscape changes, companies increasingly embrace multichannel retailing strategies. This approach offers consumers the flexibility to purchase products and services online or offline (Government of Canada, 2013). This study defines an initial engagement with a purchasing channel as the first purchase in that specific channel. In addition, this study is centered on consumers' initial engagement with purchasing channels, notably those initiated through physical storefronts, and its interaction with communication strategies and store proximity. This study aims to understand how these factors affect how consumers shop over time.

2.1 Customer Multichannel Purchase

Liu et al. (2018) articulate multichannel retailing as selling products or services through multiple sales channels. As described by Neslin et al. (2006), these channels transcend their traditional roles as mere transactional platforms and emerge as critical platforms for customer-company engagements. The delineation of transaction channels encompasses online, offline, and mobile modalities. The differentiation is imperative — online channels imply web-based platforms and email communications, offline channels refer to physical storefronts and print catalogues, and mobile channels include websites and applications accessible via handheld devices. This classification is foundational in dissecting the trajectories of consumer behavior (Liu et al., 2018). Contemporary purchasing pathways are intricate, involve multiple touchpoints, and focus on online and offline interactions (Retail Insider, 2020). From a customer's point of view, multichannel purchasing is described as using at least two different channels during the buying process. This process includes gathering information, purchasing a product or service, and receiving after-sales service (Liu et al., 2018; Schröder and Zaharia, 2008). Multichannel purchasing may lead to distinct consumer phenomena, notably webrooming and showrooming.

Webrooming, defined by the consumer practice of online product research followed by in-store purchases, has gained substantial momentum (Flavián et al., 2016). The investigative survey conducted by McKinsey & Company (2017) illustrates that a considerable segment, approximately one-third of U.S. consumers, engage in webrooming during their purchasing process for consumer-packaged goods. Jing's scholarly contribution (2018) posits that webrooming can augment retail profitability by catalyzing increased consumer influx into stores for products that require physical inspection. In the domain of fashion retail, there is a pronounced consumer inclination towards webrooming instead of showrooming (Flavián et al., 2020). Furthermore, empirical evidence from Pauwels et al. (2011) indicate a positive correlation between physical store revenue and escalated web traffic. Interestingly, consumers may experience a greater sense of uncertainty when they lack the opportunity to physically examine products or engage in direct social interactions within online environments (Mitchell, 1999). Subsequently, those who engage in webrooming may visit stores due to their need to touch and inspect products, which in turn counters the uncertainty related to online shopping and increases their confidence in their purchasing decision (Flavián et al., 2016).

Showrooming entails consumers physically interacting with products in-store and finalizing their purchase online (Mitra, 2022; Neslin et al., 2014). An interesting derivative of showrooming is pseudo-showrooming, wherein consumers scrutinize products in-store but purchase a different product online, albeit from the same retailer (Gu & Tayi, 2017). Data

collected by Statista underscore that a quasi-equivalent proportion of Canadian consumers, nearly one-third, engage intermittently in showrooming behavior (Chevalier, 2022). Jing (2018) offers a cautionary perspective, suggesting that showrooming has the potential to exacerbate competitive market pressures and facilitate price comparison, thereby undermining profit margins. However, a counter-narrative by Bell et al. (2017) demonstrate how showrooms could offer advantages on both demand and supply facets. On the demand axis, consumers can visit showrooms to gather information about products, which allows them to make better decisions, potentially save money and reduce the risks associated with purchases. Correspondingly, on the supply axis, the pre-purchase physical interaction with merchandise can potentially decrease product return rates (Bell et al., 2017). Thus, it is evident that multichannel shopping yields reciprocal benefits for consumers and retailers.

This research seeks to navigate beyond the peripheries of existing literature by unravelling the nuanced influences of the initial purchasing channel. We expect consumers' decisions in their initial purchasing channel—offline versus online— may impact their future purchasing preferences. Flavián et al. (2016) and Jing (2018) found that the motivation to touch and physically inspect a product can encourage customers to visit a store. Based on these findings, we hypothesize that the tactile experience provides a sensory benefit that can deter customers from shifting to online purchases. Additionally, Ainsworth & Foster (2017), Jing (2018) and Sen et al. (2023) reveal that the richness of in-store experiences (i.e., consumer comfort, physical inspection of products, service convenience) can foster a sense of loyalty and comfort with the offline channel. This is a potential reason why offline shoppers prefer to keep purchasing offline after their initial purchase in stores. Hence, we propose the following:

Hypothesis 1a: Customers whose initial purchase is through offline channels are associated with a lower number of online product purchases compared to those whose initial purchase is through online channels.

Hypothesis 1b: Customers whose initial purchase is through offline channels are associated with a higher number of offline product purchases compared to those whose initial purchase is through online channels.

Subsequent hypotheses (i.e., 2a, 2b, 3a, 3b, 4a, 4b) are built on the assumption that the above hypotheses are supported.

2.2 Direct Mail and Email

In the dynamic landscape of consumer engagement, direct mail and email marketing persist as crucial elements. Each one wields significant influence in shaping purchasing behaviors. As digital integration advances, these traditional forms have adapted and evolved, underscoring their enduring relevance (Aufreiter et al., 2014; Plummer, 2022). In this context, the roles of direct mail and email marketing—two seemingly divergent strategies—are pivotal in bridging the gap between online and offline consumer engagement. The synergy between offline and online marketing strategies is a testament to the evolving dynamics of consumer engagement, especially concerning their interaction with multichannel consumer practices.

Direct mail marketing, the practice of disseminating promotional content directly to prospective customers' physical mailboxes, retains a pivotal role in contemporary marketing strategies (Chittenden & Rettie, 2003; Zhang, 2023). Research from the Digital Marketing Association underscores the potency of this approach, noting that direct mail can trigger response rates that are exponentially higher than those garnered by online advertisements, potentially leading to heightened consumer purchases (Pulcinella, 2017). This perspective is further bolstered by studies from Mark et al. (2019) and Valenti et al. (2023), which attest to the profound impact of direct mail on shaping consumer purchasing choices, in digital and

physical realms. Additionally, according to an ethnographic study by Canada Post (2015), direct mail drives more traffic online than in physical storefronts. However, a gap lies in exploring how direct mail, particularly for consumers on a mailing list, moderates the effect of the initial purchasing channel on channel-specific total purchases.

Email marketing is characterized by Hudák et al. (2017) as the targeted dispatch of commercial messages to individuals' email inboxes and offers unique advantages in fostering consumer engagement. Evidence suggests that recipients of permission-based emails are more predisposed to endorse the brand than others (Merisavo & Raulas, 2004). A correlation exists between the duration of a subscription to an email list, and consumer spending (Kumar et al., 2014). Additionally, email marketing extends its influence by prompting customers to visit physical and online stores (Merisavo & Raulas, 2004; Valenti et al., 2023). Yet, an understudied aspect remains concerning the depth of email marketing's impact, especially how it interplays with consumers' initial purchasing channel to influence channel-specific total purchases.

In summary, direct mail and email marketing are pivotal in influencing consumer behavior. On the one hand, direct mail is known for its high response rates and for triggering online and offline visits (Canada Post, 2015; Mark et al., 2019; Pulcinella, 2017). On the other hand, email marketing is known for increasing consumer spending and fostering brand loyalty (Kumar et al., 2014; Merisavo & Raulas, 2004). However, a discernible gap persists in understanding their combined effect, particularly concerning how these communication methods interact with consumers' initial purchasing channels. This research is poised to illuminate the nuanced interdependencies between these marketing strategies and the initial purchasing channel in the consumer packaged goods industry—be it direct mail or email—in influencing channel-specific total purchases.

We anticipate that specific marketing strategies, such as direct mail, can act as moderators in the relationship between the initial purchasing channel and channel-specific total purchases. Certain studies argue that direct mail influences customers to shop online and offline (Mark et al., 2019; Valenti et al., 2023). Also, direct mail can inspire consumers to venture into the brand's digital realms. The study conducted by Canada Post (2015) argues that direct mail drives further visits online than in physical storefronts. Therefore, this could be an effective instrument in counterbalancing the adverse association between initial offline purchases and future online shopping activities. This notion is supported by Pulcinella (2017), who underscores the high response rates elicited by direct mail. This may imply a robust consumer-brand relationship that could spur consumers' curiosity towards the brand's online platforms. Hence, we propose the following:

Hypothesis 2a: The negative association between an initial purchase through offline channels and the number of online product purchases is weaker for customers on the direct mailing list compared to those not on the direct mailing list.

Hypothesis 2b: The positive association between an initial purchase through offline channels and the number of offline product purchases is weaker for customers on the direct mailing list compared to those not on the direct mailing list.

Similarly, we hypothesize that marketing approaches, such as email, could also play a moderating role in the relationship between the initial purchasing channel and channel-specific total purchases. Regarding email marketing, studies by Merisavo and Raulas (2004) and Valenti et al. (2023) have underscored its capacity to increase customer visits on online and offline channels. This may illustrate that consistent, permission-based emails are likely to increase consumers' recognition and valuation of the ease provided by online shopping

platforms. This implies that email communications may act as digital conduits for consumers whose journey begins in physical stores, diminishing their hesitation towards online shopping. Consequently, we posit the following:

Hypothesis 3a: The negative association between an initial purchase through offline channels and the number of online product purchases is weaker for customers on the email list compared to those not on the email list.

Hypothesis 3b: The positive association between an initial purchase through offline channels and the number of offline product purchases is weaker for customers on the email list compared to those not on the email list.

2.3 Physical Store Presence

The retail landscape is intricately woven with diverse consumer touchpoints, each harbouring its own unique experiential attributes. Brick-and-mortar stores, for instance, have carved a niche for themselves by providing a tactile arena where customers can instantly interact with and validate the quality of products, a phenomenon documented by Balasubramanian et al. (2005) and Zhang et al. (2022). This direct interaction facilitates critical evaluative processes such as quality verification and product selection. It also incorporates experiential elements like socializing and relaxation into the shopping journey, thereby transcending the mere transactional nature of purchasing (Balasubramanian et al., 2005).

In this tactile domain, consumers are offered more than just products; they are immersed in a rich, multi-sensory experience that significantly influences their purchasing decisions and brand loyalty. Frambach et al. (2007) dive into this, highlighting the various stages of the shopping experience enhanced by physical stores, from the initial information gathering to the post-purchase phase. These interactions, although subtle, play a crucial role in shaping consumer preferences and potentially fostering enduring loyalty.

In addition to these studies, Huang and Bronnenberg (2022), Lim et al. (2021), and Pancras et al. (2012) emphasize one main disadvantage of physical stores: the greater the distance between a customer and a store, the greater the travel cost. This may imply that products are less accessible, and shopping is more costly than those living closer to a store. In contrast, Forman et al. (2009) discuss the financial benefits of offline shopping, with its absence of shipping charges and a more straightforward return process, advantages that online platforms often struggle to match.

In summary, the existing literature resoundingly confirms the diverse benefits afforded by brick-and-mortar stores, ranging from the tangible assurance of product quality to the economic practicalities of reduced ancillary costs. However, a gap lies in the nuanced understanding of how consumers' proximity to these stores may interact with their initial choice of purchasing channel. This research aims to bridge the gap, investigating the complex interplay between consumers' store proximity to physical storefronts and their initial purchasing avenue. In doing so, it seeks to shed light on consumer patterns that could be instrumental in sculpting informed retail strategies.

We anticipate that proximity to a physical store can sway the balance between online and offline shopping, especially after an initial offline purchase. Balasubramanian et al. (2005), Forman et al. (2009), and Zhang et al. (2022) emphasize the advantages of physical stores. They argue that offline shopping enables customers to physically examine products, interact socially, experience a straightforward return process, and avoid shipping fees. These factors may encourage customers to continue purchasing offline following their initial in-store purchase. Albeit Huang and Bronnenberg (2022), Lim et al. (2021) and Pancras et al. (2012) show that customers incur greater transportation costs the further they are from a store; we

hypothesize that if they are located within an hour's drive, they are more likely to visit the store to make a purchase. Therefore, we argue the following:

Hypothesis 4a. The negative association between an initial purchase through offline channels and the number of online product purchases is stronger for customers located within an hour's drive to a store compared to those located further away.

Hypothesis 4b. The positive association between an initial purchase through offline channels and the number of offline product purchases is stronger for customers located within an hour's drive to a store compared to those located further away.

Our research focuses on the complex dynamics between a consumer's initial engagement with purchasing avenues, especially those initiated via offline channel, and how this intersects with marketing communication methods and store proximity, collectively illuminating their influence on the ensuing patterns of consumer purchase behaviors. Figure 1 illustrates the theoretical framework of this study.

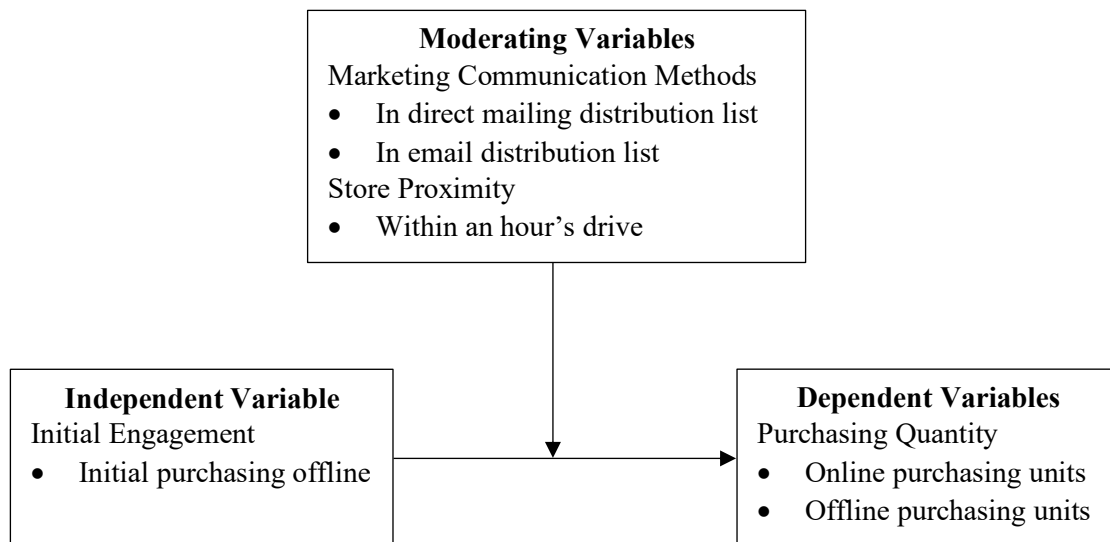


Figure 1: Theoretical Model

3. Research Methodology

3.1 Data and Variables

3.1.1 Data Collection

We gathered data from a multinational consumer packaged goods (CPG) company that operates online and physical stores. Our focus was on customers who had created an account with the company, as we lacked key variables of interest for those without an account. Among these, we specifically targeted existing customers who have held an account for more than a year. Initially, the data spanned from March 2022 to April 2023. However, to mitigate the impact of COVID-19 on our analysis, we consulted with the CPG company and decided to focus on data from March and April 2023. This decision was informed by the need to analyze the dependent variables, which measure the number of products purchased in a specific category through either online or offline channels over the preceding 12 months. This period is particularly relevant since, by March 2022, Quebec had lifted its COVID-19 restrictions on

both essential and non-essential businesses, as reported by the Retail Council of Canada (2022). These restrictions, enacted by the Quebec government in response to the pandemic first identified in February 2020, as per the Institut National de Santé Publique du Québec, included customer limits, mandatory social distancing, and mask-wearing in retail stores and shopping centers (INSPQ, 2022). The final dataset from the CPG company encompasses purchasing information from over 100,000 consumers in Quebec.

3.1.2 Variable Definitions

The dependent variables measure the number of products purchased through a channel within a specific product category in the last 12 months. As suggested by Mullahy and Norton (2022), we apply the natural log to the dependent variables and add the arbitrary constant “+1” to ensure that all observations are defined due to the data being positive and skewed to the right. The dependent variable, $\ln \text{online_purchase}_{it}$, is the natural log of the number of products purchased through the online channel in the last 12 months for customer i in month t . To estimate the number of offline products and the aggregate total (i.e., online and offline channels) number of products purchased in the last 12 months, we use $\ln \text{offline_purchase}_{it}$ and $\ln \text{total_purchase}_{it}$, respectively. Following the trimming method proposed by Sullivan et al. (2021), we remove the bottom and top 1 percentile of total purchases to remove outliers. Additionally, the dependent variables in this study have been multiplied by a factor to preserve the company’s anonymity.

The main independent variable is the customer’s initial purchasing channel, which contains $\text{initial_purchase_off}_{it}$ and $\text{initial_purchase_on}_{it}$. The dummy variable $\text{initial_purchase_off}_{it}$ can take the value of 1, representing an initial purchase made offline (i.e., in-store) or 0, representing an initial purchase made online. The dummy variable $\text{initial_purchase_on}_{it}$ can take the value of 1, representing an initial purchase made online or 0, representing an initial purchase made offline. In this study, we focus on initial purchasing offline; therefore, we only include $\text{initial_purchase_off}_{it}$ in the estimation model to avoid multicollinearity.

The first set of moderating variables pertains to marketing communication methods. The communication channel contains is_mail_{it} , is_email_{it} , and $\text{no_mail_no_email}_{it}$. The dummy variable is_mail_{it} can take the value of 1, representing customers as part of the mail distribution list or 0, representing customers not part of the mail distribution list. The dummy variable is_email_{it} can take the value of 1, representing customers as part of the email distribution list or 0, representing customers not part of the email distribution list. The dummy variable $\text{no_mail_no_email}_{it}$ can take the value of 1, representing customers not part of any distribution list or 0, representing customers part of at least 1 distribution list. Likewise, we include is_mail_{it} and is_email_{it} in the estimation models to avoid multicollinearity.

The second set of moderating variables pertains to store proximity. Store proximity contains $\text{is_close_store}_{it}$ or is_far_store_{it} . The dummy variable $\text{is_close_store}_{it}$ can take the value of 1, representing customers who live close to a store (i.e., within an hour’s drive) or 0 representing customers who live far from a store (i.e., more than an hour’s drive). The dummy variable is_far_store_{it} can take the value of 1 representing customers who live far from a store or 0, representing customers who live close to a store. Similarly, we include $\text{is_close_store}_{it}$ in the estimation models to avoid multicollinearity.

In our research, we focus on the province of Quebec, Canada. Hence, we include customers' preferred language (i.e., French or English) as a control variable. Existing literature suggests that French and English-speaking customers may exhibit distinct shopping and consumption behaviors. For example, Michon and Chebat (2004) found that in Ontario,

Canada, French-speaking shoppers tend to frequent malls primarily to make purchases, in contrast to English speakers who are more inclined to visit malls for hedonic reasons (e.g., relax, and socialize). Additionally, Schaninger et al. (1985) shed further light on the Canadian consumer landscape, revealing significant distinctions in the consumption patterns of consumer-packaged goods, specifically food and beverages, among French-speaking, bilingual, and English-speaking households. In our study, the dummy variable lg_en_{it} can take the value of 1 representing customers whose preferred language is English or 0 representing customers whose preferred language is French. The dummy variable lg_fr_{it} can take the value of 1 representing customers whose preferred language is French or 0 representing customers whose preferred language is English. Likewise, we only include lg_en_{it} in the estimation models to avoid multicollinearity.

Table 1 presents the summary statistics. On average, customers purchased 2,694.69 products online, 1,023.86 products offline, and 3,718.55 products in total in the previous 12 months with standard deviations of 3,116.01, 1,832.08 and 3,003.16, respectively. A high standard deviation compared to the average signifies that there is a significant variation in products purchased by customers. Table 2 shows the correlation matrix of our variables. All pairwise correlations for independent variables included in our models are less than the absolute value of 0.50, meaning multicollinearity is not a significant concern in our econometric model (Kutner et al., 2005).

Table 1: Summary Statistics

Variable	Unit	Obs	Mean	SD	Min	Max
$online_purchase_{it}$	Units	369,398	2,694.69	3,116.01	0	15,520
$offline_purchase_{it}$	Units	369,398	1,023.86	1,832.08	0	15,520
$total_purchase_{it}$	Units	369,398	3,718.55	3,003.16	160	15,520
$initial_purchase_on_{it}$	Dummy Variable	369,398	0.54	0.50	0	1
$initial_purchase_off_{it}$	Dummy Variable	369,398	0.46	0.50	0	1
is_mail_{it}	Dummy Variable	369,398	0.65	0.48	0	1
is_email_{it}	Dummy Variable	369,398	0.69	0.46	0	1
$no_mail_no_email_{it}$	Dummy Variable	369,398	0.09	0.29	0	1
$is_close_store_{it}$	Dummy Variable	369,398	0.87	0.34	0	1
$is_far_store_{it}$	Dummy Variable	369,398	0.13	0.34	0	1
lg_en_{it}	Dummy Variable	369,398	0.28	0.45	0	1
lg_fr_{it}	Dummy Variable	369,398	0.72	0.45	0	1

Table 2: Correlation Matrix

NO.	Variables	1	2	3	4	5	6	7	8	9	10	11	12
1	<i>ln online_purchase_{it}</i>	1.00											
2	<i>ln offline_purchase_{it}</i>	-0.73	1.00										
3	<i>ln total_purchase_{it}</i>	0.55	-0.08	1.00									
4	<i>initial_purchase_on_{it}</i>	0.48	-0.47	0.15	1.00								
5	<i>initial_purchase_off_{it}</i>	-0.48	0.47	-0.15	-1.00	1.00							
6	<i>is_mail_{it}</i>	0.21	-0.19	0.09	0.32	-0.32	1.00						
7	<i>is_email_{it}</i>	0.08	0.00	0.14	-0.11	0.11	-0.06	1.00					
8	<i>no_mail_no_email_{it}</i>	-0.17	0.12	-0.11	-0.13	0.13	-0.44	-0.48	1.00				
9	<i>is_close_store_{it}</i>	-0.19	0.22	-0.04	-0.22	0.22	-0.07	0.00	0.04	1.00			
10	<i>is_far_store_{it}</i>	0.19	-0.22	0.04	0.22	-0.22	0.07	-0.00	-0.04	-1.00	1.00		
11	<i>lg_en_{it}</i>	-0.05	0.04	-0.06	0.02	-0.02	0.04	-0.08	0.01	0.10	-0.10	1.00	
12	<i>lg_fr_{it}</i>	0.05	-0.04	0.06	-0.02	0.02	-0.04	0.08	-0.01	-0.10	0.10	-1.00	1.00

3.2 Estimation Models

Equation 1 looks at how the initial purchasing channel directly impacts the number of products purchased online for customer i in month t . This equation also includes the moderating impact of communication methods and store proximity on the initial purchasing channel and the number of products purchased online. Similarly, equation 1 can also be used to evaluate the number of offline purchases. In equation 1, γ_i measures the consumer effects, v_t measures the monthly time effects, and ε_{it} represents the error term.

$$\begin{aligned}
 \ln \text{ online_purchase}_{it} &= \beta_0 \\
 \ln \text{ offline_purchase}_{it} &+ \beta_1 \cdot \text{initial_purchase_off}_{it} \\
 &+ \beta_2 \cdot \text{is_mail}_{it} \\
 &+ \beta_3 \cdot \text{is_email}_{it} \\
 &+ \beta_4 \cdot \text{is_close_store}_{it} \\
 &+ \beta_5 \cdot \text{initial_purchase_off}_{it} \cdot \text{is_mail}_{it} \\
 &+ \beta_6 \cdot \text{initial_purchase_off}_{it} \cdot \text{is_email}_{it} \\
 &+ \beta_7 \cdot \text{initial_purchase_off}_{it} \cdot \text{is_close_store}_{it} \\
 &+ \beta_8 \cdot \text{lg_en}_{it} \\
 &+ \beta_9 \cdot \text{month_eff}_t \\
 &+ \gamma_i + v_t + \varepsilon_{it}
 \end{aligned}$$

Equation (1)

4 Estimation Results

Table 3 contains the estimation results where the dependent variable is the natural log of the number of products purchased online and the natural log of the number of products purchased offline by the customer in the last 12 months. Models 1.1 and 2.1 present the baseline model which includes *initial_purchase_off_{it}*, *is_mail_{it}*, *is_email_{it}*, *is_close_store_{it}* and the control variable *lg_en_{it}*. Models 1.2 and 2.2 include the moderating effect of communication methods. Models 1.3 and 2.3 include the moderating effect of store proximity. Models 1.4 and 2.4 show the full model including all moderating effects. We perform random effects panel data regression models to answer our research questions.

4.1 Direct Effect of Initial Purchasing Channel

First, centering on the online channel, Hypothesis 1a states that *customers whose initial purchase is through offline channels are associated with a lower number of online product purchases compared to those whose initial purchase is through online channels*. In model 1.1, *initial_purchase_off_{it}* has a significantly negative impact on online product purchases, -2.64 ($p < 0.01$). This means that customers initially engaged through offline channels purchase 92.88%¹ fewer units of a product online than those initially engaged through online channels. Thus, Hypothesis 1a is supported. The coefficient of *initial_purchase_off_{it}* in model 1.4 decreases to -3.15 ($p < 0.01$) and remains significant. This suggests that the effect of the initial purchase offline on the number of online products purchased depends on the moderating variables, which include communication methods and store proximity.

Next, centering on offline channel, Hypothesis 1b states that *customers whose initial purchase is through offline channels are associated with a higher number of offline product purchases compared to those whose initial purchase is through online channels*. In model 2.1, *initial_purchase_off_{it}* has a significantly positive impact on offline product purchases, 2.35 ($p < 0.01$). This means that customers initially engaged through offline channels purchase 948.56% more units of a product offline than those initially engaged through online channels. Thus, Hypothesis 1b is supported. The coefficient of *initial_purchase_off_{it}* in model 2.4 increases to 2.73 ($p < 0.01$) and remains significant. This suggests that the effect of the initial purchase offline on the number of offline products purchased depends on the moderating variables, which include communication methods and store proximity.

4.2 Moderating Effect of Communication Methods

Direct Mail Communication

First, focusing on the online channel, Hypothesis 2a states that *the negative association between an initial purchase through offline channels and the number of online product purchases is weaker for customers on the direct mailing list compared to those not on the direct mailing list*. In model 1.4, the coefficient for *initial_purchase_off_{it}* is -3.15 ($p < 0.01$) and the coefficient for *initial_purchase_off_{it} · is_mail_{it}* is 0.84 ($p < 0.01$); both being significant. As the direct effect is negative and the moderating effect is positive, the moderator makes the direct effect less negative. Thus, Hypothesis 2a is supported and is represented in Figure 2(a).

Next, focusing on the offline channel, Hypothesis 2b states that *the positive association between an initial purchase through offline channels and the number of offline product purchases is weaker for customers on the direct mailing list compared to those not on the direct*

¹ When the dependent variable (Y) is subjected to a natural log transformation and a dummy variable is included as an independent variable, Halvorsen and Palmquist (1980) recommend using the following equations: Let g represent the relative effect of the presence of the dummy variable on Y. As a result, $g = (Y_1 - Y_0) / Y_0$, where Y_1 and Y_0 signify the dependent variable values when the dummy variable is set to one and zero, respectively. As a result, the coefficient of the dummy variable is $c = \ln(1 + g)$. The relative effect on Y can be expressed as $g = \exp(c) - 1$, and the percentage effect is $100 \cdot g = 100 \cdot \{\exp(c) - 1\}$. For example, in Table 3, the coefficient for *initial_purchase_off_{it}* in model 1.1 is -2.64; thus, the relative effect on Y is $g = \exp(-2.64) - 1 = -0.9288$ and the percentage effect is $100 \cdot -0.9288 = -92.88\%$.

mailing list. In model 2.4, the coefficient for $initial_purchase_off_{it}$ is 2.73 ($p < 0.01$) and the coefficient for $initial_purchase_off_{it} \cdot is_mail_{it}$ is -0.52 ($p < 0.01$); both being significant. As the direct effect is positive and the moderating effect is negative, the moderator makes the direct effect less positive. Thus, Hypothesis 2b is supported and is represented in Figure 2(b).

Email Communication

For the online channel, Hypothesis 3a states that *the negative association between an initial purchase through offline channels and the number of online product purchases is weaker for customers on the email list compared to those not on the email list*. In model 1.4, the coefficient for $initial_purchase_off_{it}$ is -3.15 ($p < 0.01$) and the coefficient for $initial_purchase_off_{it} \cdot is_email_{it}$ is 0.76 ($p < 0.01$); both being significant. As the direct effect is negative and the moderating effect is positive, the moderator makes the direct effect less negative. Thus, Hypothesis 3a is supported and is represented in Figure 3(a).

For the offline channel, Hypothesis 3b states that *the positive association between an initial purchase through offline channels and the number of offline product purchases is weaker for customers on the email list compared to those not on the email list*. In model 2.4, the coefficient for $initial_purchase_off_{it}$ is 2.73 ($p < 0.01$) and the coefficient for $initial_purchase_off_{it} \cdot is_email_{it}$ is -0.47 ($p < 0.01$); both being significant. As the direct effect is positive and the moderating effect is negative, the moderator makes the direct effect less positive. Thus, Hypothesis 3b is supported and is represented in Figure 3(b).

4.3 Moderating Effect of Store Proximity

For the online channel, Hypothesis 4a states that *the negative association between an initial purchase through offline channels and the number of online product purchases is stronger for customers located within an hour's drive to a store compared to those located further away*. In model 1.4, the coefficient for $initial_purchase_off_{it}$ is -3.15 ($p < 0.01$) and the coefficient for $initial_purchase_off_{it} \cdot is_close_store_{it}$ is -0.63 ($p < 0.01$); both being significant. As the direct and moderating effects are negative, the moderator makes the direct effect more negative. Thus, hypothesis 4a is supported and is represented in Figure 4(a).

For the offline channel, Hypothesis 4b states that *the positive association between an initial purchase through offline channels and the number of offline product purchases is stronger for customers located within an hour's drive to a store compared to those located further away*. In model 2.4, the coefficient for $initial_purchase_off_{it}$ is 2.73 ($p < 0.01$) and the coefficient for $initial_purchase_off_{it} \cdot is_close_store_{it}$ is 0.32 ($p < 0.01$); both being significant. As the direct and the moderating effects are positive, the moderator makes the direct effect more positive. Thus, hypothesis 4b is supported and is represented in Figure 4(b).

Interestingly, consistent with previous studies, our findings also reveal that French and English-speaking customers exhibit distinct consumption behaviors via online and offline channel. This can be observed through the direct effect models (i.e., models 1.1 and 2.1). In model 1.1, lg_en_{it} has a significantly negative impact on online product purchases, -0.30 ($p < 0.01$). This means that customers whose preferred language is English purchase 25.92% less units of a product online compared to those whose preferred language is French. In model 2.1, lg_en_{it} has a significantly positive impact on online product purchases, 0.19 ($p < 0.01$). This means that customers whose preferred language is English purchase 20.52% more units of a product offline than those whose preferred language is French.

Table 3: Estimation Results

Variables	DV: $\ln \text{online_purchase}_{it}$				DV: $\ln \text{offline_purchase}_{it}$			
	Model 1.1	Model 1.2	Model 1.3	Model 1.4	Model 2.1	Model 2.2	Model 2.3	Model 2.4
$\text{initial_purchase_off}_{it}$	-2.64***(0.01)	-3.73***(0.03)	-2.04***(0.04)	-3.15***(0.05)	2.35***(0.01)	3.02***(0.03)	2.04***(0.04)	2.73***(0.04)
is_mail_{it}	0.40***(0.01)	-0.08***(0.02)	0.40***(0.01)	-0.08***(0.02)	-0.21***(0.01)	0.09***(0.02)	-0.21***(0.01)	0.09***(0.02)
is_email_{it}	0.80***(0.01)	0.47***(0.02)	0.80***(0.01)	0.47***(0.02)	-0.25***(0.01)	-0.04***(0.01)	-0.25***(0.01)	-0.04***(0.01)
$\text{is_close_store}_{it}$	-0.70***(0.02)	-0.70***(0.02)	-0.56***(0.02)	-0.57***(0.02)	0.90***(0.02)	0.90***(0.02)	0.83***(0.02)	0.84***(0.02)
$\text{initial_purchase_off}_{it} \cdot \text{is_mail}_{it}$		0.84***(0.03)		0.84***(0.03)		-0.52***(0.02)		-0.52***(0.02)
$\text{initial_purchase_off}_{it} \cdot \text{is_email}_{it}$		0.76***(0.02)		0.76***(0.02)		-0.47***(0.02)		-0.47***(0.02)
$\text{initial_purchase_off}_{it} \cdot \text{is_close_store}_{it}$			-0.65***(0.04)	-0.63***(0.04)			0.33***(0.04)	0.32***(0.04)
lg_en_{it}	-0.30***(0.01)	-0.29***(0.01)	-0.30***(0.01)	-0.29***(0.01)	0.19***(0.01)	0.19***(0.01)	0.19***(0.01)	0.19***(0.01)
month_eff_i	-0.02***(0.00)	-0.02***(0.00)	-0.02***(0.00)	-0.02***(0.00)	-0.01***(0.00)	-0.01***(0.00)	-0.01***(0.00)	-0.01***(0.00)
CONSTANT	7.07***(0.02)	7.67***(0.03)	6.96***(0.02)	7.57***(0.03)	2.97***(0.02)	2.60***(0.02)	3.03***(0.02)	2.65***(0.02)
Number of Observations	369,398	369,398	369,398	369,398	369,398	369,398	369,398	369,398
Wald-Chi	65,408.19***	68,069.87***	65,716.36***	68,360.00***	60,337.90***	61,494.04***	60,430.38***	61,578.53***

Note: Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

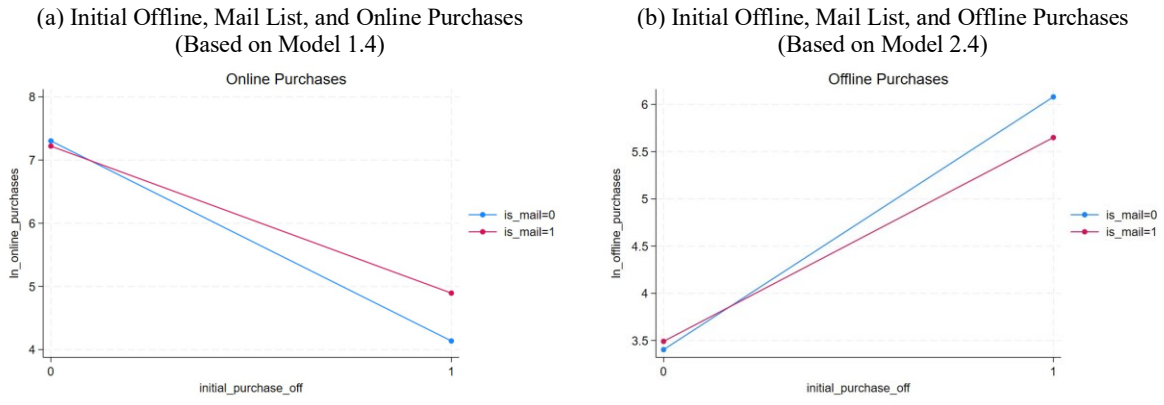


Figure 2: Margins for Initial Purchasing Channel and Mail

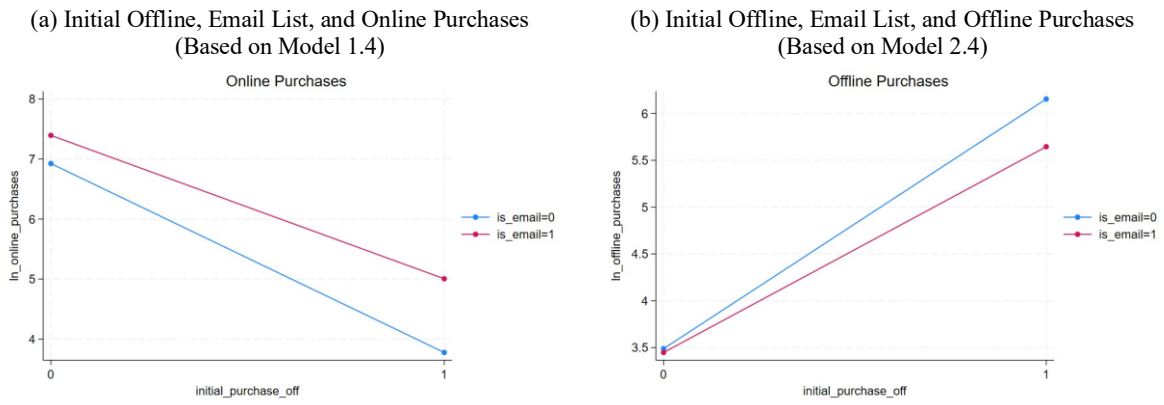


Figure 3: Margins for Initial Purchasing Channel and Email

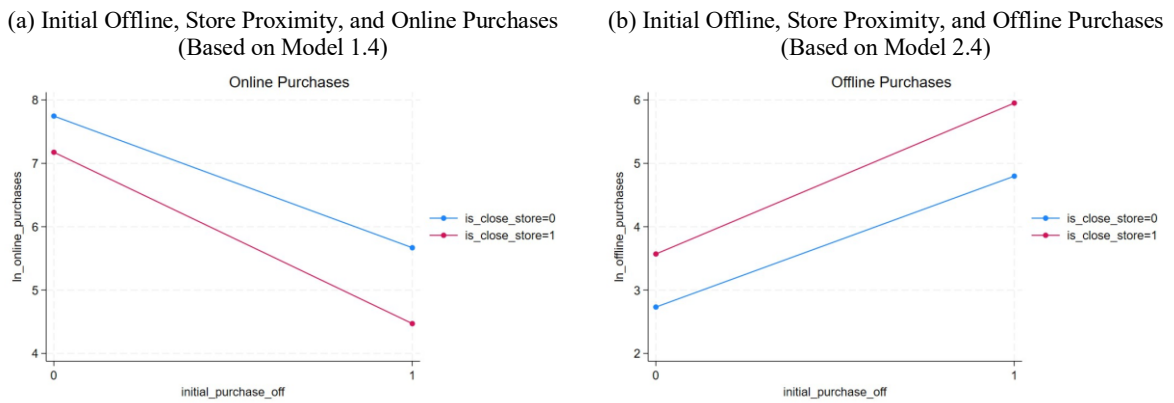


Figure 4: Margins for Initial Purchasing Channel and Store Proximity

5. Extended Analysis I

5.1 Estimation Models

Equation 2 looks at how the initial purchasing channel directly impacts the aggregate total number of products purchased (i.e., online, and offline combined) for customer i in month t . This equation also includes the moderating impact of communication methods and store proximity on the initial purchasing channel and the total number of products purchased. In equation 2, γ_i measures the consumer effects, ν_t measures the monthly time effects, and ε_{it} represents the error term.

$$\begin{aligned} \ln \text{total_purchase}_{it} &= \beta_0 \\ &+ \beta_1 \cdot \text{initial_purchase_off}_{it} \\ &+ \beta_2 \cdot \text{is_mail}_{it} \\ &+ \beta_3 \cdot \text{is_email}_{it} \\ &+ \beta_4 \cdot \text{is_close_store}_{it} \\ &+ \beta_5 \cdot \text{initial_purchase_off}_{it} \cdot \text{is_mail}_{it} \\ &+ \beta_6 \cdot \text{initial_purchase_off}_{it} \cdot \text{is_email}_{it} \\ &+ \beta_7 \cdot \text{initial_purchase_off}_{it} \cdot \text{is_close_store}_{it} \\ &+ \beta_8 \cdot \text{lg_en}_{it} \\ &+ \beta_9 \cdot \text{month_eff}_t \\ &+ \gamma_i + \nu_t + \varepsilon_{it} \end{aligned}$$

Equation (2)

5.2 Estimation Results

Table 4 contains the estimation results where the dependent variable is the natural log of the aggregate total quantity of products purchased for a specific category in the aggregate channels (i.e., offline and online combined) in the last 12 months. Model 3.1 presents the baseline model, which includes *initial_purchase_off_{it}*, *is_mail_{it}*, *is_email_{it}*, *is_close_store_{it}* and the control variable *lg_en_{it}*. Model 3.2 includes the moderating effect of communication methods. Model 3.3 includes the moderating effect of store proximity. Model 3.4 shows the full model, including all moderating effects. We perform random effects panel data regression models.

5.2.1 Direct Effect of Initial Purchasing Channel

In model 3.1, *initial_purchase_off_{it}* has a significantly negative impact on total product purchases, -0.30 ($p < 0.01$). This means that customers initially engaged through offline channels purchase 26.25% less units of a product than those initially engaged through online channels. The coefficient of *initial_purchase_off_{it}* in model 3.4 decreases to -0.38 ($p < 0.01$) and remains significant. This suggests that the effect of the initial purchase offline on the total number of products purchased may depend on the moderating variables, which include communication methods and store proximity.

5.2.2 Moderating Effect of Communication Methods

In model 3.4, the coefficient for $initial_purchase_off_{it}$ is -0.38 ($p < 0.01$) and the coefficient for $initial_purchase_off_{it} \cdot is_mail_{it}$ is 0.13 ($p < 0.01$); both being significant. As the direct effect is negative and the moderating effect is positive, the moderator makes the direct effect less negative. The moderating effect of mail communication method is illustrated in Figure 5.

In model 3.4, the coefficient for $initial_purchase_off_{it}$ is -0.38 ($p < 0.01$) and the coefficient for $initial_purchase_off_{it} \cdot is_email_{it}$ is 0.12 ($p < 0.01$); both being significant. As the direct effect is negative and the moderating effect is positive, the moderator makes the direct effect less negative. The moderating effect of email communication method is illustrated in Figure 6.

Overall, these results show that the negative effect of the initial purchase through offline channels on the total quantity of product purchases is weaker for customers on the direct mail and email distribution lists than those not on these distribution lists.

5.2.3 Moderating Effect of Store Proximity

In model 3.4, the coefficient for $initial_purchase_off_{it}$ is -0.38 ($p < 0.01$) and the coefficient for $initial_purchase_off_{it} \cdot is_close_store_{it}$ is -0.10 ($p < 0.01$); both being significant. As the direct and the moderating effects are negative, the moderator makes the direct effect more negative. The moderating effect of store proximity is illustrated in Figure 7.

Interestingly, the negative association between an initial purchase through offline channels and total quantity of product purchases is stronger for customers within an hour's drive to a store than those located further away.

Table 4: Estimation Results

Variables	DV: $\ln total_purchase_{it}$			
	Model 3.1	Model 3.2	Model 3.3	Model 3.4
$initial_purchase_off_{it}$	-0.30***(0.00)	-0.47***(0.01)	-0.21***(0.02)	-0.38***(0.02)
is_mail_{it}	0.09***(0.00)	0.02**(0.01)	0.09***(0.00)	0.02**(0.01)
is_email_{it}	0.32***(0.00)	0.27***(0.01)	0.32***(0.00)	0.27***(0.01)
$is_close_store_{it}$	0.01** (0.01)	0.01* (0.01)	0.04***(0.01)	0.03***(0.01)
$initial_purchase_off_{it} \cdot is_mail_{it}$		0.13***(0.01)		0.13***(0.01)
$initial_purchase_off_{it} \cdot is_email_{it}$		0.12***(0.01)		0.12***(0.01)
$initial_purchase_off_{it} \cdot is_close_store_{it}$			-0.11***(0.02)	-0.10***(0.02)
lg_en_{it}	-0.11***(0.00)	-0.11***(0.00)	-0.11***(0.00)	-0.11***(0.00)
$month_eff_{it}$	-0.03***(0.00)	-0.03***(0.00)	-0.03***(0.00)	-0.03***(0.00)
CONSTANT	7.74***(0.01)	7.83***(0.01)	7.72***(0.01)	7.81***(0.01)
Number of Observations	369,398	369,398	369,398	369,398
Wald-Chi	13,092.96***	13,441.93***	13,138.76***	13,484.45***

Note: Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

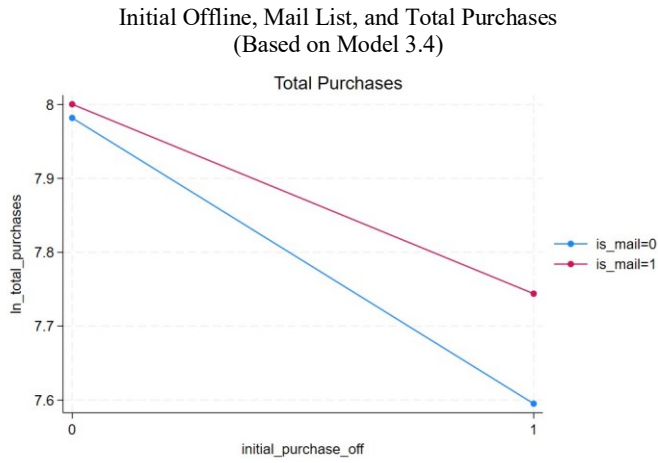


Figure 5: Margins for Initial Purchasing Channel and Mail



Figure 6: Margins for Initial Purchasing Channel and Email



Figure 7: Margins for Initial Purchasing Channel and Store Proximity

6. Extended Analysis II

We aim to elucidate the impact of customer attributes on their purchasing patterns and determine whether this relationship exhibits variance across different purchasing channels, including online, offline, and the aggregate total. We employ the principal component analysis (PCA) to delineate customer profiles based on their initial purchasing channels (i.e., online or offline), communication methods (i.e., direct mail, email or no communication), store proximity (i.e., customers located within an hour's drive or located further away), and preferred language (i.e., English or French). The principal component analysis is defined by Jolliffe and Cadima (2016) as a statistical technique for reducing the number of dimensions in a dataset. It reduces the dimension by creating linearly independent variables to maximize the variance.

6.1 Customer Profile

Table 5 provides the eigenvalues per principal component. According to Jolliffe and Cadima (2016), we keep principal components where the cumulative account for variance is at least 95%. Therefore, we keep the first five principal components representing 97% of the variance. Table 6 contains the loadings of the principal components. The loadings for the five principal components kept can be utilized to delineate customer profiles.

- 1) The first component, Comp1, has high positive loadings (≥ 0.28) for customers whose initial purchase is online, who are on the direct mail distribution list and who live far from a store. It has high negative loadings (≤ -0.28) for customers whose initial purchase is offline and who live close to a store. Based on the high positive loadings, we name this dimension *IONL_ML_FAR*.
- 2) The second component, Comp2, has high positive loadings (≥ 0.28) for customers whose preferred language is English. It has high negative loadings (≤ -0.28) for customers whose preferred language is French. Based on the high positive loadings, we name this dimension *EN*.
- 3) The third component, Comp3, has high positive loadings (≥ 0.28) for customers on the direct mail and email distribution lists and who live close to a store. It has high negative loadings (≤ -0.28) for customers who are not on a distribution list and live far from a store. Based on the high positive loadings, we name this dimension *ML_EML_CLO*.
- 4) The fourth component, Comp4, has high positive loadings (≥ 0.28) for customers whose initial purchase is offline, who are on the email distribution list and who live far from a store. It has high negative loadings (≤ -0.28) for customers whose initial purchase is online, who are not on a distribution list and who live close to a store. Based on the high positive loadings, we name this dimension *IOFF_EML_FAR*.
- 5) The fifth component, Comp5, has high positive loadings (≥ 0.28) for customers whose initial purchase is offline and who are on the direct mail distribution list. It has high negative loadings (≤ -0.28) for customers whose initial purchase is online and who are on the email distribution list. Based on the high positive loadings, we name this dimension *IOFF_ML*.

Table 5: Eigenvalue per Principal Component

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	2.61	0.52	0.29	0.29
Comp2	2.09	0.44	0.23	0.52
Comp3	1.65	0.17	0.18	0.70
Comp4	1.48	0.61	0.16	0.87
Comp5	0.86	0.55	0.10	0.97
Comp6	0.32	0.32	0.04	1
Comp7	0	0	0	1
Comp8	0	0	0	1
Comp9	0	.	0	1

Note: Bold indicates retained principal components

Table 6: Eigenvector per Principal Component

Variables	Comp1	Comp2	Comp3	Comp4	Comp5
	<i>IONL_ML_FAR</i>	<i>EN</i>	<i>ML_EML_CLO</i>	<i>IOFF_EML_FAR</i>	<i>IOFF_ML</i>
<i>initial_purchase_on_{it}</i>	0.50	0.22	0.16	-0.31	-0.29
<i>initial_purchase_off_{it}</i>	-0.50	-0.22	-0.16	0.31	0.29
<i>is_mail_{it}</i>	0.28	0.17	0.35	0.07	0.72
<i>is_email_{it}</i>	-0.02	-0.12	0.34	0.54	-0.54
<i>no_mail_no_email_{it}</i>	-0.18	-0.03	-0.50	-0.48	-0.11
<i>is_close_store_{it}</i>	-0.43	0.17	0.44	-0.30	-0.05
<i>is_far_store_{it}</i>	0.43	-0.17	-0.44	0.30	0.05
<i>lg_en_{it}</i>	-0.10	0.63	-0.20	0.22	-0.04
<i>lg_fr_{it}</i>	0.10	-0.63	0.20	-0.22	0.04

6.2 Estimation Results

We perform random effects panel data regression models for online, offline, and total purchases, using all five principal components. Based on the coefficients in Table 7, these components are ranked based on how they contribute to the purchasing quantity in Table 8. In this case, a component ranked first has the most significant impact, while a component ranked fifth has the lowest impact. The most critical component that likely leads to greater online, offline, and total purchases is *IONL_ML_FAR*, *IOFF_ML*, and *ML_EML_CLO*, respectively.

Table 7: Coefficient per Principal Component

Variables	$\ln \text{online_purchase}_{it}$	$\ln \text{offline_purchase}_{it}$	$\ln \text{total_purchase}_{it}$
<i>IONL_ML_FAR</i>	0.82***(0.00)	-0.75***(0.00)	0.09***(0.00)
<i>EN</i>	0.15***(0.00)	-0.15***(0.00)	-0.01***(0.00)
<i>ML_EML_CLO</i>	0.34***(0.00)	-0.16***(0.00)	0.10***(0.00)
<i>IOFF_EML_FAR</i>	-0.14***(0.00)	0.21***(0.00)	0.02***(0.00)
<i>IOFF_ML</i>	-0.42***(0.01)	0.30***(0.01)	-0.09***(0.00)
<i>month_eff_i</i>	-0.02***(0.00)	-0.01***(0.00)	-0.03***(0.00)
CONSTANT	5.99***(0.01)	4.58***(0.01)	7.86***(0.00)
Number of Observations	369,398	369,398	369,398
Wald-Chi	65,150.38***	60,490.00***	12,328.57***

Note: Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 8: Ranking of Principal Components by Coefficient

Rank	$\ln \text{online_purchase}_{it}$	$\ln \text{offline_purchase}_{it}$	$\ln \text{total_purchase}_{it}$
1	<i>IONL_ML_FAR</i>	<i>IOFF_ML</i>	<i>ML_EML_CLO</i>
2	<i>ML_EML_CLO</i>	<i>IOFF_EML_FAR</i>	<i>IONL_ML_FAR</i>
3	<i>EN</i>	<i>EN</i>	<i>IOFF_EML_FAR</i>
4	<i>IOFF_EML_FAR</i>	<i>ML_EML_CLO</i>	<i>EN</i>
5	<i>IOFF_ML</i>	<i>IONL_ML_FAR</i>	<i>IOFF_ML</i>

7. Conclusion and Discussion

7.1 Conclusion

The main analysis focuses on the total quantity of products purchased for a specific product category in online and offline channels, respectively. First, our analysis reveals how consumers who first engage offline tend to make 92.88% fewer online purchases and 948.56% more offline purchases than consumers who first engage online. Second, for consumers who first engage offline, being on the direct mailing list may mitigate the decline in online purchases while potentially mitigating the increase in offline purchases. Third, for consumers who first engage offline, being on the email list may mitigate the decline in online purchases while potentially mitigating the increase in offline purchases. Fourth, for consumers who first engage offline, store proximity may amplify the decline in online purchases while potentially amplifying the increase in offline purchases.

Extended analysis I focuses on the total quantity of products purchased for a specific category in the aggregate channels (i.e., offline, and online combined). First, our analysis reveals how consumers who first engage offline tend to make 26.25% fewer total purchases than consumers who first engage online. Second, for consumers who first engage offline, being on the direct mailing list may mitigate the decline in total purchases. Third, for consumers who first engage offline, being on the email distribution list may mitigate the decline in total

purchases. Fourth, for consumers who first engage offline, store proximity may amplify the decline in total purchases.

Extended analysis II aims to elucidate the impact of customer attributes on their purchasing patterns and determine whether this relationship exhibits variance across different purchasing channels, including online, offline, and the aggregate total. We employ the principal component analysis to delineate customer profiles. Our findings suggest that the most critical principal component that likely leads to greater online, offline, and total purchases is *IONL_ML_FAR*, *IOFF_ML*, and *ML_EML_CLO*, respectively.

7.2 Theoretical Implications

The theoretical contributions of our research are manifold, providing substantial advancements in understanding multichannel purchasing behavior. First, by establishing a correlation between the initial purchasing channel and channel-specific total purchases, we illuminate the complexities of the initial purchase, extending beyond the simplified consumer-retailer interactions previously theorized (Ainsworth & Foster, 2017; Bell et al., 2017; Flavián et al., 2016; Sen et al., 2023). This aspect of consumer behavior, often overshadowed in existing literature, is critical as it underpins the entirety of the shopping journey, influencing not just immediate purchase decisions but also long-term loyalty.

Furthermore, our findings on the effects of direct mail and email communications on purchasing behavior offer a nuanced perspective that challenges traditional marketing theories. Traditionally, communications were understood as linear and direct in their influence (Mark et al., 2019; Merisavo & Raulas, 2004; Valenti et al., 2023). However, our study reveals a moderating role, wherein these communications can significantly alter predetermined behavior patterns established by the initial purchasing channel, suggesting a more intricate interplay between communication strategies and consumer decision-making processes.

Moreover, the emphasis on store proximity as a pivotal factor in consumer purchasing decisions reinstates the relevance of geographical considerations in the digital age. This reaffirms that despite the digital surge, traditional factors like the ability to inspect a product, interact with other people, straightforward returns, and cost savings with the absence of shipping fees are likely to hold considerable influence in shaping consumer preferences and may override digital conveniences under certain circumstances (Balasubramanian et al., 2005; Forman et al., 2009; Huang and Bronnenberg, 2022; Zhang et al., 2022).

7.3 Managerial Implications

From a practical standpoint, our research offers several actionable insights that retail managers and industry leaders can leverage to enhance operational strategies and consumer engagement. Understanding the influence of the initial purchasing channel on consumer behavior allows retailers to allocate resources strategically and devise channel-specific marketing initiatives. For instance, recognizing that a consumer whose initial purchase is offline is less likely to purchase as much in online channels can prompt the development of targeted strategies to encourage online engagement, such as exclusive online discounts (Winkler & Lockhart, 2022), digital loyalty programs (Dorotic, 2019), and personalized recommendations based on previous purchases (Basu, 2021).

According to a study by McKinsey & Company (2023), companies that send tailored messages to consumers, also known as personalization, can significantly increase their revenues by 5 to 15 percent. Furthermore, the research conducted by Arora et al. (2021) demonstrates that 71% of consumers expect personalized communications from companies. The insights that direct mail and email communications can moderate purchasing behaviors highlight the retailer's need to invest in robust, personalized communication frameworks.

These frameworks should be agile, allowing for tailoring messages that resonate with the consumers' initial purchasing experiences and preferences, thereby fostering a more connected and harmonious brand experience across channels. This study also indicates how consumers on the direct mail and email distribution lists tend to purchase more products in total than those who are not part of these distribution lists. Therefore, it is essential for companies to entice consumers to be on the direct mail and email distribution lists to potentially reach a wider audience, increase multichannel purchases, and increase revenues.

Additionally, the pronounced effect of store proximity on purchasing decisions underscores the importance of strategically located physical stores. It suggests an integrated approach that leverages the tangible allure of in-store experiences and the convenience of online services. Retailers, especially those in the consumer packaged goods industry, should consider hybrid models such as buy-online-pickup-in-store, ship-to-customer, and buy-online-and-return-in-store services, which seamlessly blend online and offline channels (Gallino & Moreno, 2014; Rankin, 2022; Huang & Jin, 2020).

Overall, our study not only bridges theoretical gaps but also equips practitioners with nuanced understandings and strategic tools that are indispensable in navigating the increasingly complex multichannel retail landscape. By acknowledging and adapting to these multifaceted consumer behaviors, retailers can cultivate resonant brand experiences, drive sustained engagement, and secure a competitive advantage in a dynamic marketplace.

8. Limitations and Future Research Directions

This study is subject to several limitations. First, our analysis is confined to a single multinational consumer packaged goods company, relying solely on data from Quebec, Canada. Future research should broaden its scope since consumer behavior can vary markedly across regions due to cultural nuances and socio-economic factors. Determining if the observed patterns are consistent in other Canadian provinces with their distinct cultural and economic landscapes is crucial. Moreover, extending this investigation to diverse international settings would be valuable to assess our findings' universality and to understand how different cultural and market conditions might influence consumer behavior, thereby confirming or challenging the generalizability of our conclusions beyond Quebec's unique context.

Second, the dependent variables measure the number of products within a specific product category purchased through a channel (i.e., online, offline) in the last 12 months. This approach may obscure shorter-term fluctuations in purchasing behavior. Future research could address this by adopting a more granular analysis. This would capture the impact of seasonal variations and allow for the examination of temporal purchasing trends. Additionally, exploring purchasing patterns during promotional events could serve as a quasi-experimental method to discern whether our findings are consistent or vary during periods of marketing campaigns compared to regular times. Such an approach would offer a more detailed understanding of purchasing behaviors under different temporal and situational conditions.

Third, within the scope of our study, we analyze the dependent variables at the product category level. Future studies could explore a different method by looking at the dependent variables at the stock-keeping unit (SKU) level. This approach can potentially accentuate variations in consumer behavior that arise from the specific SKUs or highlight a consistent pattern across the entire range. Moreover, this method could elucidate any occurrences of product substitution or complementary effects.

Fourth, our study is limited to customers on mail and email distribution lists, potentially overlooking communication frequency, communication overload and content nuances. A more expansive approach would entail a detailed analysis of the volume and nature of customer

communications. Quantifying the frequency of emails and direct mail each customer receives would shed light on the intensity of company-customer interaction. In addition, future studies can examine how an overload of communications sent to customers might influence purchasing patterns. Also, examining the content of these communications (e.g., promotional material, informational content, call to action) could reveal insights into how different messaging strategies may influence purchasing behavior. This comprehensive analysis could uncover intricate relationships between communication strategies and consumer responses, offering valuable insights for more targeted and effective customer engagement.

Fifth, our approach to gauging consumer store proximity bears limitations, as it currently hinges on categorizing consumers based on whether they reside within an hour's drive to a physical store. Future research could adopt more precise measures for assessing store proximity. For example, calculating the distance from a consumer's household to the physical store using postal codes would offer a more accurate representation of proximity. Additionally, it is important to consider the retail agglomeration around the store's location. Consumers often visit shopping areas for multiple purposes; therefore, understanding the retail agglomeration in the store's vicinity could provide insights into shopping behavior and store choice. This expanded perspective would allow a more nuanced understanding of how store proximity and the retail environment influence consumer purchasing decisions.

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