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Systematic Review

Consumers' Marketing Channel Choice and the Impact on Logistics and Operations: A Systematic Literature Review of the Fresh Food and Grocery Sector

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Abstract: *Background*: Diverse marketing channels have been developed with the advent of digitalization. In the fresh food and grocery retail sector, consumers may have a large choice of channels to shop from. In this case, an analysis of their behavior is crucial for retailers. Therefore, the present paper provides a state-of-the-art review of existing papers dealing with consumers' channel choice when buying groceries. *Methods*: A systematic literature review (SLR) is performed following the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) procedure, identifying 36 research papers published in the last decade. *Results*: The results present the principal methodologies adopted by the analyzed research papers to address this topic, along with the various channels available to consumers to date. Other important outcomes of this review include the main variables that can affect consumer choice when deciding between the available channels and the limitations of the analyzed papers, along with suggestions for future research directions to address these limitations. *Conclusions*: This paper discusses the essential effects of consumers' channel choice on the logistics and operation services of grocery retailers. It also provides an integrative framework linking the influencing factors of consumer choice with outcomes directly impacting grocery retailers' logistics services.

Keywords: grocery; fresh food; marketing channels; logistics

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1. Introduction

Digitalization has markedly changed the retail sector in recent decades. The emergence of the COVID-19 pandemic has accelerated this transformation in the fresh food and grocery sector. Sales channels have become more diverse but also more sophisticated with the use of new technologies. Multichannel systems first appeared with technological advent [1]. But such systems are moving toward the application of Omni-channel strategies where customers can seamlessly use all available channels [2]. In Omni-channel management, all channels are integrated and provide similar retail experiences with cross-channel objectives as the managerial objectives, rather than per-channel objectives in multichannel management [3]. A wide variety of channels are integrated into Omni-channel management, including all possible channels that can be used by consumers, namely, retail channels (stores, online websites, and direct marketing), mobile channels, social media, and customer touchpoints (including mass communication channels such as TV, radio, print, and C2C) [3].

However, from a customer point of view, different channels have different disadvantages. A customer's channel choice is, thus, based on several factors that the customer takes into consideration in an attempt to make a trade-off to choose the most suitable channel when they want to shop for groceries. Understanding the underpinning factors

and theories that drive customer choice of a given channel has been the focus of significant research efforts.

Within the context of this study, the terms fresh food and grocery encompass a spectrum of products integral to daily life. Fresh food refers to perishable items such as fruits, vegetables, meat, and dairy, which are often characterized by a shorter shelf life. On the other hand, grocery encompasses a broader range of products, including non-perishable items like canned goods, packaged snacks, and household essentials. The selection of these categories for examination is driven by their fundamental role in consumer lifestyles and their notable transformations in the wake of digitalization and the evolving retail landscape.

Although the number of research papers that have addressed customer channel choice is quite considerable, a framework that brings together influencing factors and the various channels that exist thus far is not yet available as a reference for these types of studies. Therefore, the purpose of this paper is to investigate different grocery and fresh food marketing channels and to identify factors that lie behind the choice of a channel by a customer through a systematic literature review (SLR) of 36 research papers. The aim is also to examine the significant impacts that channel choice could have on logistics. A second objective is to disentangle existing limitations in current research and offer future research directions for researchers aiming to address this topic. This paper also provides an overview of the methodologies and models used to analyze consumer behavior in the context of channel choice, along with the evolution of research through the years and by country. This review charts a course for scholars in this field by addressing the following key research questions:

1. What factors influence grocery and fresh food channel choice?
2. How do these channels impact logistics in the sector?
3. What methodologies are used to analyze consumer behavior in this context?
4. How has research evolved over time and across countries?
5. What are the current limitations and future research directions in this field?

A in-depth search in high-quality databases reveals limited reviews that partially cover fresh food and grocery marketing channels (Table 1). Indeed, Lagorio and Pinto [4] presented an SLR of food and grocery logistics issues, with a discussion of consumer behavior regarding channel choice in some sections. Similarly, Melacini et al. [1] examined logistics issues, mainly e-fulfillment, when switching to Omni-channel retailing. Hänninen et al. [5] provided a synthesis of the transition through the decades from stores to multi- and Omni-channel strategies in all sectors, along with some mentions about the grocery sector. A general SLR was also conducted by Verhoef et al. [3], which provides important findings about shopping channel choice in multi- and Omni-channel strategies but offers little attention to the fresh food and grocery sector. Another review focuses on the particular case of Short Food Supply Chains (SFSCs) and provides insights into the behavior of consumers related to this type of channel [6]. The transformation of food supply chains through technology was tackled by Abideen et al. [7], but they did not include the impact of channel choice on the supply chain. Therefore, a state-of-the-art paper on customer channel choice in the fresh food and grocery sector is needed.

Table 1. Previous review papers.

Reference	Retailing Sector	Focus	Timespan	Size
[3]	Non-food	Shopping channel choice	2014–2015	11
[1]	General	Logistics issues	2002–2017	58
[4]	Food and grocery	Logistics issues	2008–2017	56
[5]	General	Technological and digital developments	1990–2019	60

Table 1. *Cont.*

Reference	Retailing Sector	Focus	Timespan	Size
[7]	Food	Technological and digital developments	2010–2021	112
[6]	Food	Short food supply chain issues	2020–2021	44
This Review	Fresh food and grocery	Shopping channel choice, logistics, and operational issues	2012–2022	36

The first contribution of the present SLR is that it identifies drivers of channel choice by an individual. The second contribution is that it offers a gap analysis and suggests a research agenda to guide researchers aiming to address this field.

The structure of this paper is as follows: The second section describes the methodology used to conduct the SLR. The third section outlines the main results, followed by the fourth section that addresses the main impact on operations and logistics services. The fifth section summarizes the limitations in current research and suggests a future research agenda. Lastly, the sixth section summarizes the paper with some concluding remarks.

2. Methodology

SLR represents a research methodology that is different from primary research studies. Indeed, SLR offers an investigation on a specific topic over a designated time frame by analyzing the extent of the related literature. SLR aids in elucidating variations among studies conducted on a particular topic [8]. It enables us to comprehensively understand a subject by both synthesizing existing knowledge and uncovering unexplored realms, thus often surpassing the insights derived from a single study [9]. The present SLR follows the PRISMA procedure [10]. The PRISMA procedure was created to assist authors in generating clear and comprehensive reports of their reviews [11]. To this end, PRISMA-P serves as a guide for good planning and organization of reviews [10]. Therefore, we developed a review protocol specifying the various steps that would be followed by us when conducting the review [12]. Details about the methodology are explained in this paper to enhance our review's replicability and transparency [13]. The PRISMA checklist is presented in Table S1 in the Supplementary Materials of this paper.

After iterative refinement, the search query documented in Table 2 and the criteria for inclusion and exclusion outlined in Table 3 were ultimately employed. The search made for this review covered ten years. Web Of Science (WOS) and Scopus were the two high-quality databases used for this purpose, along with Google Scholar. Combinations of relevant keywords using logical operators (OR, AND) were employed, as shown in Table 2. Only research papers written in English and published after undergoing a peer-review process were included. Therefore, review papers, books, book chapters, and conference proceedings were excluded. Moreover, papers on irrelevant subject areas were excluded. We went through several selection steps to obtain the final list of papers we included in the review.

Table 2. Search query.

((Marketing channel) OR (Distribution channel)) AND (Food OR Grocery)

Table 3. Filtering criteria.

Only retain publications that satisfy the following conditions: Type: journal article. Language: English. Time: from 2012 onwards. Excluded subject areas: medicine and dentistry, neuroscience, psychology, computer science, geography, and tourism.

Figure 1 presents the search and selection steps that we used.

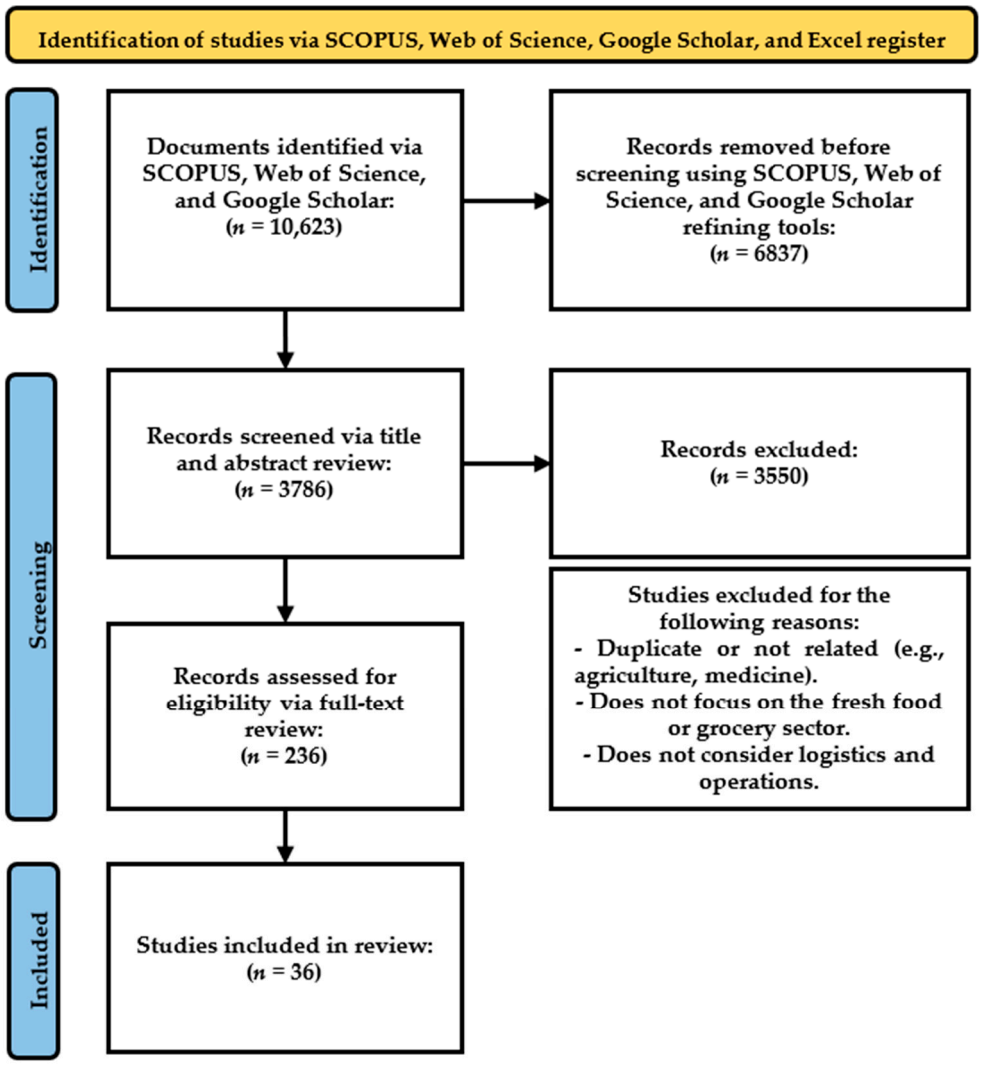

Figure 1. Flow chart of the study selection process based on the Systematic Reviews and Meta-Analyses (PRISMA) protocol.

The first step after the search refinement using the filtering criteria consisted of a scan of the identified papers' titles and abstracts. The next step provided us with the final number of papers to include in the SLR and consisted of a cross-reading followed by a deep reading of the selected papers. Both backward and forward snowballing reference searching approaches were employed to ensure the coverage of all relevant papers. The focus was on the fresh food and grocery sector. The aim was to select papers that deal with consumer channel choice in the scope of the fresh food and grocery sector. Consequently, we found that all papers studying consumer behavior naturally target grocery retailers and fresh food providers. While they may constitute just a fraction of the entire sector, they are the primary connection to the final consumers. Moreover, all selected papers discuss consumer channel choice's impact on the logistics and operations services of grocery retailers and fresh food providers, which is one of the main objectives of this review.

The data extraction form contains general information such as each paper's title and year of publication. It also includes specific data that allow us to analyze and better understand existing fresh food and grocery marketing channels. This dataset was created by extracting all identified marketing channels in the researched papers included in this review and variables, attributes, or factors that could influence consumer channel choice. This also included the extraction of information about these papers' limitations and future directions.

3. Results

3.1. Bibliometric Analysis

This section shows the overall statistical results regarding the publication year of the selected papers and the country where each study was held. Figure 2 shows the number of papers published per year between 2012 and 2022. A significant number of papers were published in the last two years due to the increasing share of e-grocery during the COVID-19 pandemic. More than 75% of the papers published in 2020 and 2021 compare consumer behavior between online and offline shopping channels. Online shopping channels expanded when all countries faced the COVID-19 pandemic [14], and consumers bought more groceries online than before due to social distancing [15]. Consumers' valuation of food and their willingness to pay for food increased during this crisis period [16].

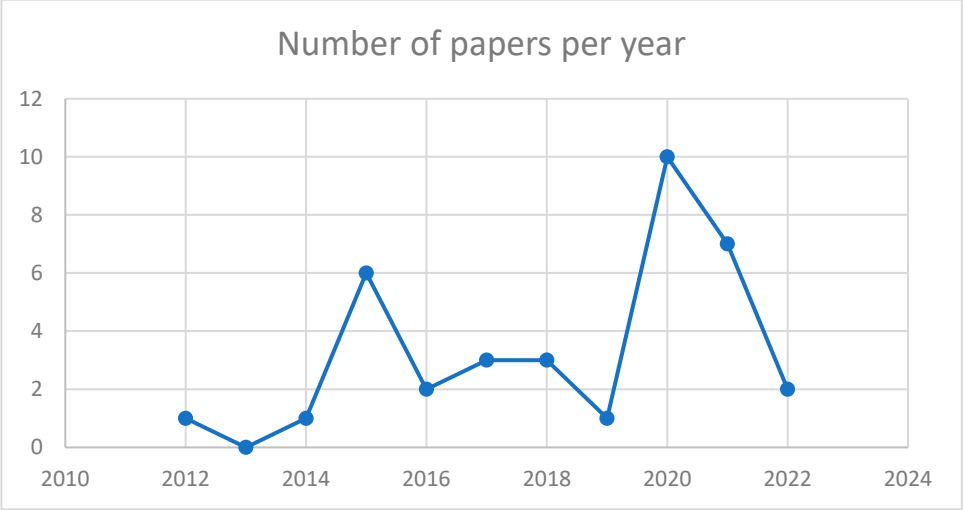

Figure 2. Number of papers per year.

The results shown in Figure 3 are related to the number of studies per country and reflect the worldwide trends regarding the leading countries in the e-grocery sector. Most published studies were undertaken in the UK, Europe's leading country in online grocery [17] and one of the top five countries around the world [18]. The second major contributors were China, Italy, Germany, and the USA. Indeed, China is the top global online grocery market [19], while Italy and Germany are catching up to other countries. Hence, efforts should be intensified in all fields, including research on the development of online shopping channels [17]. Previous reports expect the USA to be the world's second leader in e-grocery, which justifies the amount of research conducted in this country to understand consumer behavior when choosing between channels [19].

3.2. Modeling Technics

The present SLR focuses on papers dealing with consumer channel choice in regard to groceries and fresh food. Most of the selected studies (86%) are quantitative. They have based their analysis either on survey results or on available data such as panel data [20–22] and loyalty card information [23]. Indeed, researchers more often use quantitative methods due to the availability of 'big data' [24], and the problem regarding consumer channel choice is better addressed by understanding the influencing factors of a specific outcome [25]. Quantitative methods are the best choice for analysis in our context to understand factors and variables that push a consumer to choose a specific grocery channel. Moreover, most studies recruited a representative sample, thereby strengthening their results' generalizability and validity.

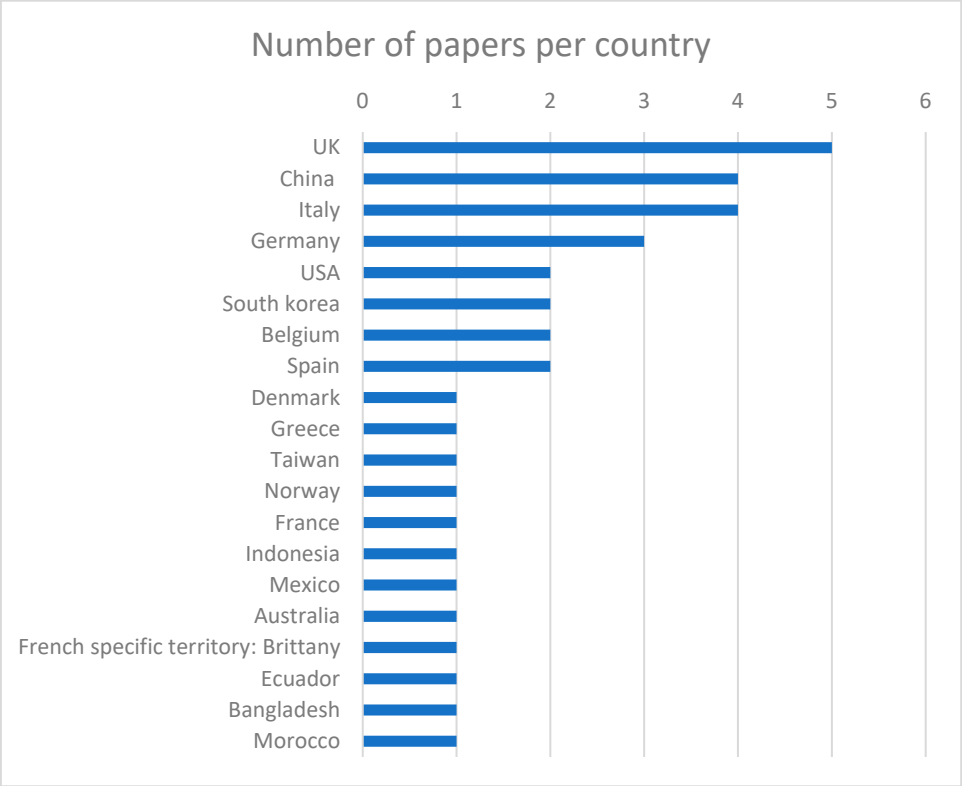

Figure 3. Number of papers per country.

Some quantitative studies use regression analysis as a statistical modeling technique to estimate the relationship between variables. Among regression models, discrete choice models analyze individual choices such as purchase decisions [26]. Decision makers face a set of alternatives and show their preferences through their choice [26]. In this perspective, studies on consumer preferences for marketing channels use discrete choice models to analyze the behavior of consumers toward different grocery shopping channels. Multinomial models are widely used to assess an individual's behavior when they are faced with two or more choices and choose the one that maximizes their utility [26,27]. Grocery shoppers have access to different online channels (home delivery, pick-up, delivery to grocery lockers, etc.) as well as offline channels (proximity stores, hypermarkets, alternative markets, etc.). Maltese et al. [28] collected quantitative data to estimate a multinomial logit model for assessing Italian consumers' preferences concerning grocery channels, including physical stores, home delivery (HD), and click and pick. Their estimated multinomial model also evaluated consumers' willingness to pay taking into account various attributes considered in the model, such as lead time and product range, which are essential when using an online grocery channel [28]. Melis et al. [21] used a similar modeling technique to analyze online store choice and its underlying effects. In one study, a multinomial model was also employed to study consumers' behavior and, more precisely, their loyalty to an online channel [29]. More advanced models incorporate channel choice and travel mode choice simultaneously by using both multinomial and nested logit models, given that multinomial models do not account for unobserved attributes and assume no correlation between random terms [30]. Probit models also offer the possibility to relax the independence assumption of multinomial logit models [26]. Probit models were also used by several studies included in the present SLR to analyze consumer channel choice. A probit model was used to estimate consumer decisions about purchasing or not purchasing fresh food online in one study [31], and another study used a probit model to investigate consumers' online choice from various specific multichannel choices [20]. Chintagunta et al. [32] integrated transaction costs in a channel choice model integrating a probit model. In another study, a

probit model was used to estimate consumers' willingness to pay for vegetables and meat via different channels [16]. In sum, discrete choice models are apt for examining consumer behavior in response to a range of alternatives, which are represented by different grocery channels in this context.

Another modeling technique used in the selected papers studying consumers' grocery channel choices is structural equation modeling (SEM). This is a powerful multivariate technique that is increasingly used in research to evaluate multivariate causal relationships [33]. This technique has been used to estimate consumers' willingness to shop for groceries online [34], identify factors affecting consumers' intention to switch from traditional to online grocery shopping [14], and identify factors creating value for customers in their use of a click-and-collect channel [35]. SEM can be used in various other investigations in marketing and management research [34], hence offering a robust tool for understanding the causal relations between multiple variables.

Most selected papers involved the use of discrete choice models over SEM in their analysis of consumer behavior regarding marketing channel choice. Despite being a sophisticated statistical technique that helps understand the relationships between latent constructs or unobservable variables, SEM cannot handle categorical variables, which means this method is not suitable for choice modeling. On the contrary, discrete choice models are predictive models, which not only allows the prediction of the preferred choice made by consumers but also the probability of a choice being chosen. These models also provide coefficients that help understand how variable-level changes affect the likelihood of selecting an alternative. Therefore, the decision to utilize discrete choice modeling to assess consumer preferences for a marketing channel is well-founded.

3.3. Food and Grocery Channels

The present SLR investigates diverse grocery channels available to consumers. Most selected papers (64%) compare consumers' behavior between online and offline channels (Figure 4). Few of them discuss online channels and offline channels separately. Furthermore, digitalization has brought forth a comfortable way of buying goods online while performing other activities [36], affecting how individuals interact with physical shopping [37]. Thus, it is necessary to comprehend the interaction between digital and physical channels and how consumers choose between them.

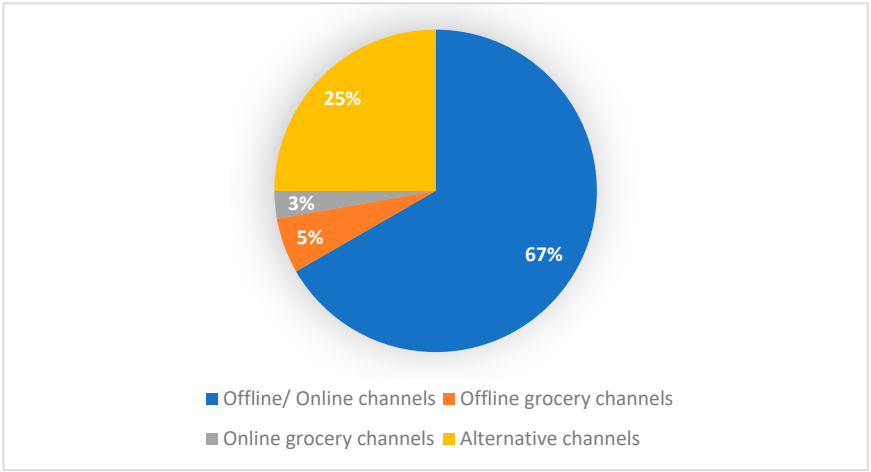

Figure 4. Percentage of papers per channel type.

The advent of digitalization has brought substantial and dynamic changes to the retail sector over the past few decades [3,5]. New technologies have allowed retailers to move to new channels, such as Omni channels and O2O [5]. This has allowed consumers to shop more conveniently, mainly through mobile apps, but also through large stores that offer a variety of products and services rather than small ones [5,38]. A decrease in shopping

in small markets or convenience stores is observed [38] as time-saving and sustainable orientation are the main attractive drivers for this channel type [39], with small markets and stores being popular for some daily purchases only for a limited category of shoppers. In contrast, many shoppers prefer large stores and online channels [40]. Studies focusing on offline and online channels have attempted to disentangle different categories of purchase drivers. Jara et al. [35] aimed to identify factors creating value for consumers for using a click-and-collect online channel's sub-channels. Their study distinguishes between a drive-out model, which is a solitary station developed by a pure player not belonging to any store; a drive-in model, where customers order online and take their order from a pick-up station that is close to their local store; and an in-store picking model where orders are prepared within a hypermarket or supermarket [35].

Most selected studies in the present SLR compare offline channels with online channels, sometimes distinguishing between sub-channels. Figure 5 shows all identified channels and sub-channels categorized as online or offline. One research paper differentiates between mobile apps and online channels made available through websites [41]. This paper shows that mobile app adoption does not influence many consumers' decisions to purchase from the physical channels. Still, it dramatically impacts these online channels as consumers substitute their grocery purchases from such channels with purchases made via mobile apps. Gatta et al. [42] differentiated between click and pick and HD, which are two online channels, and compared them to the physical store channel without specifying the offline store type. Marcucci et al. [36] made a similar distinction between channels, presented factors influencing consumers' channel choice, and calculated the impact that a change in travel behavior has on the environment. Other research studies identified drivers of e-grocery adoption without making a specific distinction between online and offline sub-channels [43]. To sum up, the central focus is on factors influencing consumers' online channel choice when compared to physical shopping.

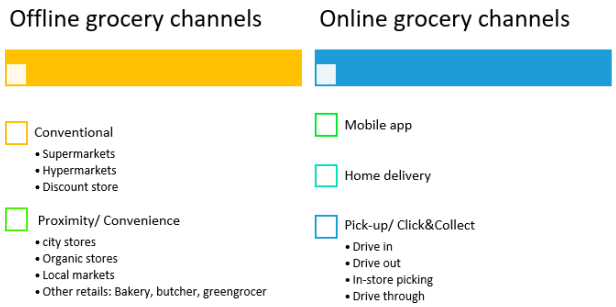

Figure 5. Identified online and offline channels.

Fruits and vegetables represent an integral part of groceries. Due to their characteristics and high perishability, some research studies focused on channels explicitly related to grocery shopping for fruits and vegetables. These research studies distinguished between alternative channels (Figure 6) that substitute the usual proximity-based conventional physical stores.

Alternative channels	Farmers' markets
	Traditional markets
	General food store
	Specialty food stores
	Social-media-based SFSCs

Figure 6. Alternative channels.

Research studies comparing direct-to-consumer channels with intermediated channels generally found that convenience is one of the drivers to buy fresh fruits from these latter channels [44,45]. Intermediated channels include chain stores and grocery stores, while direct-to-consumer channels (direct selling) comprise farmers' markets and traditional or urban markets. Specialty food stores can be considered an intermediated channel for fruits and vegetables and offer more convenience and a wider assortment than farmers' markets [46]. These types of stores are considered to provide organic fresh foods with high quality based on an innovative concept [47]. It is also worth mentioning that alternative direct channels, such as farmers' markets, can offer various products besides fruit and vegetables [48], hence providing convenience for their customers. The specificity of these alternative markets is that they offer social relationships that are missing in conventional stores [49].

Two relatively similar alternative channels can provide different values to customers, and the profiles of those who buy from one channel can differ from those who purchase from the other channel. Indeed, farm shops and farmers' markets are two direct-to-consumer channels, but shoppers' profiles vary from one channel to another [50]. Social-media-based short food supply chains (SFCSs) comprise a digital type of alternative channels. Nowadays, social-media-based SFCSs are becoming very well known by consumers, and small farmers can seize the opportunity to sell their fresh products without intermediaries at almost no cost [51]. However, efforts should be made to convert customers to this type of channel or other online alternative channels, as most people trust fresh products bought directly from farmers via a non-digital channel [52]. To sum up, alternative channels for fruits and vegetables are varied and worthy of being a research focus. However, in this digital era, studies should include a comparative analysis of digital alternative channels of fresh products, which are increasingly available worldwide, especially after the pandemic. The focus should not only be on specialty marketing channels for fruits and vegetables but also on marketing channels for other organic and natural grocery products, such as dried fruits, honey, meat, and fish products.

3.4. Channel Choice Drivers

Drivers of consumer channel choice are diverse, and each study included in this review focused on some categories of attributes that seem relevant to its context. The present SLR grouped such influencing factors into different categories. As shown in Table 4, different names can be used by different studies for the same factor or variable. We mention these different names in Table 4 to enable readers to more easily search for the information in the corresponding papers. For example, some papers use the word 'price' to express 'product price', which is the same as 'product cost', whereas others use 'average basket' as most studies chose to examine the total spending per basket or per trip rather than a single product price. The same situation is observed for the category delivery cost, where all mentioned factors express the same meaning. In the category time, however, lead time or delivery speed can be used interchangeably, but 'time window' is used in this category to express the limited time period for delivery. The other categories do not contain repetitive terms of the same factors (variables/attributes).

The first category of variables focusing on products' price is omnipresent. Indeed, almost half of the papers included a price variable and assessed its influence on consumers' channel choice. According to some studies, price factors do not automatically drive the choice of a channel. It depends not only on shoppers' profiles but also on the channel type in some cases [23,44,50]. Fruit buyers at chain stores consider the products' price, unlike people who buy their fruits from independent stores or local markets [44]. Similarly, grocery shoppers' ranking of the importance of price when choosing online or offline channels varies according to their profile (segment) [23,43]. Other studies found that price negatively influences consumers when choosing a channel [28,45]. However, in other cases, consumers pay more in terms of product price to have more convenience, better service, or more assortment of products [36].

Table 4. Factors influencing consumer channel choice.

Factors' Category	Factors' Names as Mentioned by Selected Papers for Each Category
Socio-demographic	Age, Gender, Income, Job, Education, Household size, Car availability
Price	Price/Product price/Total spending/Average basket/Average spending per trip/Expenditure/Product cost
Delivery cost	Delivery cost/service cost/Fee of home delivery/Delivery fee
Time	Lead time/Delivery speed/Time window/
Assortment	Product range/Products assortment/Variety/Product type/Category related variables
Frequency	Shopping frequency/Percentage of trips online or offline/Most frequent shopping time
In-store atmosphere	Friendliness of atmosphere/In-store stimuli/Appearance/Modernity/Traditionality/Lack of shopping atmosphere or inspiration
Convenience	Convenience/Independent opening hours
Product details	Local products/Organic/Certified organic
Experience	Online experience
Service	Problem solving/Customer satisfaction/Reliability/Motivation/Repatronage Intentions/Personal interaction/Human relations with staff/Social commitment/Emotions
Quality	Quality
Travel	Travel modes/Trip chaining/Travel time/Distance to the store/Closeness to consumer's home
Risk	Perceived online risk/Insecurity about online channel/Perceived complexity/Lack of feeling, touching, and smelling the goods in online shopping
Other	Perceived social norm/Environmental concerns/Pro-social concerns/Support local farmers/Confidence in small farmers' products/Confidence in food safety in direct marketing channels/Urban–rural classification/Technology Concerns/Consumer reviews/Perceived ease of use (PEOU)/Perceived usefulness (PU)

Undoubtedly, consumers who desire higher convenience and good service are willing to pay more in delivery fees, especially for larger baskets [34]. Studies have proven that delivery charges discourage households from buying groceries online [52]; thus, offering a free delivery service can even increase the market share of e-grocery home delivery channels [36,42]. This zero-fee strategy can stimulate online purchases and encourage people to make such purchases for everyday goods.

Online channels attract shoppers who believe that it allows them to optimize their time while buying groceries [43]. Consequently, analyzing the effect of time attributes on shoppers' attitudes is very important when studying channel choice. Zheng et al. [31] pointed to the importance of delivery speed for home delivery services. Gatta et al. [42] and Marcucci et al. [36] emphasized that shorter lead time and time windows can extend consumers' willingness to purchase from an online channel. Time can even have a negative effect on online channel choice [28]. Despite the importance of time-related factors, few studies on grocery channels have included them in their modeling and analysis.

Delivery time and the time saved by making purchases using online channels are often associated with the distance to a customer's usual store, the travel mode the consumer will use, and if there will be trip chaining with other activities. In fact, proximity to a market or store is crucial to consumers [44]. Consequently, as the distance to the store becomes longer, consumers are less likely to choose the associated channel [41]. In other words, as the travel time gets higher to go to a specific physical store, the less likely consumers will choose it and the more likely they will be willing to pay more for a channel offering a shorter travel time [45].

Obviously, saving time is an essential convenience aspect of online shopping. This involves several attributes, such as independence from opening hours, ease of ordering, and no queuing, making saving time a pivotal motive to choose online grocery shopping [34].

'Convenience seekers' tend to be attracted by online grocery channels, as confirmed by Harris et al. [53]. The advantages of convenience can be higher for specific product categories, such as heavy and bulky ones [20]. In sum, convenience is a primary factor driving grocery and food channel choices, including for non-digital channels [44].

In addition to convenience, product assortment or range is one of the variable categories discussed by a considerable number of papers selected for the present SLR. Indeed, consumers are sensitive to product assortment when choosing a channel to purchase their groceries or fresh food [21,43,47]. An expansion of consumers' share of wallet can be stimulated when there is better integration between online and offline assortments [20]. Similarly, other studies have provided evidence that an increase in product range positively influences consumers' channel choice, especially for online ones [28,42]. This positive influence can grow as consumers gain experience with online shopping, making product assortment a turning point in consumer choice [21].

Research studies have analyzed and discussed the influence of multiple factors on the choice of marketing channels. Hedonic values have a significant influence on marketing channel choice [46]. In fact, relational benefits, such as the relations established with store employees, are determinants in some click-and-collect concepts [35]. Likewise, Sultana [54] underlines that the personality of employees and their attitudes toward problem solving significantly affect channel selection. On the contrary, perceived risks related to online channels, along with feelings of insecurity, can be barriers to online channel adoption [34,43].

In conclusion, many different factors can be considered drivers in grocery and fresh food channel selection. Researchers cannot study consumer behavior in selecting between channels by analyzing a limited number of variables. Some factors complement each other, while others are negatively correlated. Comprehending the interactions between the factors examined in an analysis is also crucial, as is the case for factor selection.

4. Impact on Logistics and Operation Services

The study of consumers' channel choice behavior is closely related to logistics and operation issues [42]. The starting point of logistics and operations considers consumers' demand on each channel, consumers' product choices, consumers' attitudes, etc. The various channels identified as available in the grocery sector imply differences in retailers' processes. Most of the time, a pure online player takes charge of the last-mile delivery. In other cases, customers have the option to personally retrieve their orders from a designated locker, to which the e-grocer delivers the items. In this particular case, the last mile is split between the e-grocer and the consumer. Estimating the share of consumers willing to opt for delivery to lockers and those that will select home delivery helps online grocery retailers better allocate financial, material, and human resources. Alternatively, a brick-and-mortar grocery store, considered a pure offline player, is not concerned by the last mile. This does not mean that the overall transportation costs are lower for offline stores compared to online stores. The latter sometimes takes advantage of direct delivery from a distribution center (DC) or a warehouse. In contrast, physical stores have to deliver from a DC or a warehouse to the store themselves. They could incur additional costs related to human resources, unique materials, renting, and inventory-related costs. Costs vary depending on several other factors. Chintagunta et al. [32] show that transaction costs for online shopping can be lower than offline shopping if the basket is large. However, if the basket is small, online shopping costs will be high. The same study points to channel choice decision as an essential element to help retailers quantify costs, mainly in relation to trip-related variables and product categories [32,53].

For multichannel grocery retailers, operations are not interlinked. Therefore, these retailers' objective is to optimize operations, costs, and resources separately. Conversely, integrating multiple channels in an Omni-channel network entails a more complex juggling between different channels' operation services. This integration represents one of the biggest challenges to retailers' logistics services [15]. Indeed, one of the critical issues is the number of operation facilities needed that can minimize logistics costs [55].

In the same way, retailers' allocation policies are central to handling these challenges [1]. Product availability between the two primary channel categories (online and offline) can vary depending on the categories of products. Some researchers have shown that bulky/heavy categories can be more sold online, whereas perishables are more present in physical stores [20]. Additionally, order preparation in an online order requires a variant time, depending on the category of products and the type of fulfillment chosen by managers. Indeed, a store-based e-fulfillment strategy seems to be costly vis à vis DC e-fulfillment. Nonetheless, an efficient reallocation of orders to different time windows, stores, and delivery vehicles could result in significant savings [56]. Other channels, for instance, the pick-up option, require a different managerial approach.

Figure 7 shows an integrative framework representing the interrelationship between consumers' grocery channel choice and retailers' logistics and operation services. This framework represents a significant result of the present SLR. The framework links the information presented in the above sections to provide an understanding of how the selected studies have analyzed their key outcomes for grocery retailers. The determinants are the various variables/factors used in existing research models. Studies included in the present SLR have tested different types of variables that are related mainly to price, assortment, time, cost, travel, and socio-demographic variables. First, in light of our integrative framework, new research will need to examine other combinations of variables that may influence consumers' channel choice and may obtain different outcomes. As the framework synthesizes key determinants from existing studies, researchers could refer to Section 3.4 for a detailed list of the variables examined. Second, an important result is the type of models that we recommend researchers to employ and has proven to be effective. Indeed, discrete choice models are very powerful tools to analyze and predict consumers' choice regarding grocery channels. This has been validated by a larger number of research studies included in this review.

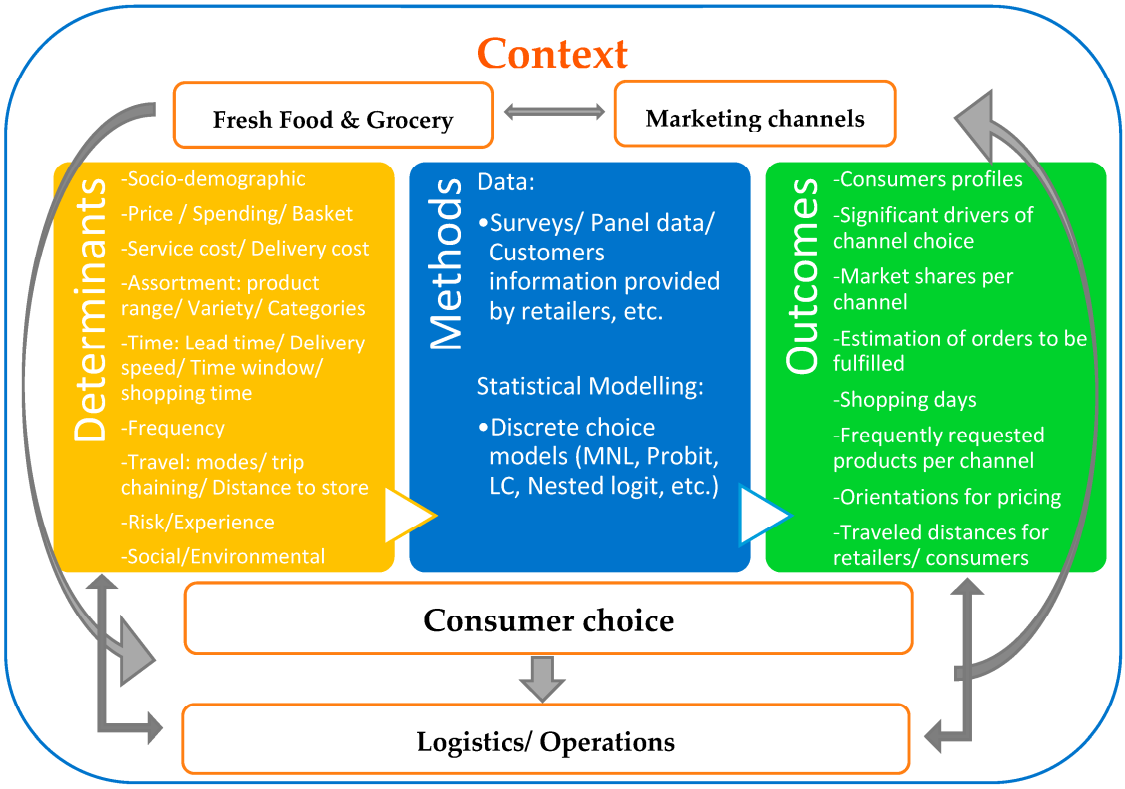

Figure 7. Integrative framework: consumer grocery channel choice and the impact on logistics and operations.

Third, the outcomes shown in the framework uncover shoppers' profiles for each type of channel. This framework also identifies significant channel choice drivers, which are mostly interlinked, in accordance with the number of studies examining these drivers. For logistics services, an important parameter to know is shopping days in online channels, which makes it easier to plan deliveries and allocate the workforce. Moreover, generalizable results regarding consumer trips and traveled distances made by delivery vehicles can enlighten retailers' logistics strategies. Hence, this review shows the importance of channel choice research for forecasting and planning for operations and logistics services.

A prominent research issue is how to take into account a complete business logistics model that integrates inventory and capacity management, distribution network design, and delivery planning and execution operations. Most importantly, there is a need to evaluate how this type of models can generate value for consumers while keeping costs at a low level [1]. Consumers are used to fast deliveries and high levels of service, making the efficient management of supply chains a must for grocery retailers and fresh food providers [51]. To this end, the efficient consolidation of the last-mile delivery will help retailers allocate their resources better and reduce costs [42]. In addition, on-time data offered via new technologies, specifically delivery trips and routing optimization data, should be integrated into research models to provide results that approach real-world situations [36].

Additionally, the choice between online grocery shopping and in-store grocery shopping has a very different impact, mainly on the environment. Operations vary depending on the part of the supply chain process we are dealing with. Aside from the fact that consumers are the ones who perform the last-mile delivery in physical channels, there are differences in the replenishment phase as well as in the pre-sale and sale phases. Indeed, Siragusa and Tumino [57] showed that the emissions generated from both types of channels are very different in the replenishment, pre-sale, and sale phases between e-grocery and brick-and-mortar grocery retail; online channels are less harmful to the environment than offline ones [57]. This fact was confirmed by X. Wang et al. [58], who also highlighted that the operation of each channel type influences emissions. Food waste is another form of energy waste. The awareness of both logistics services and consumers, in addition to correct practices, will help reduce food waste [59]. Therefore, a better understanding of consumer behavior toward different channels is a crucial input for operations and logistics services, which should be taken into account by research studies.

5. Gap Analysis and Future Research Directions

An analysis of limitations, or gap analysis, is one of the important results of an SLR. It allows readers to grasp the current knowledge gaps found in the literature according to their field expertise without going through the review process. Limitations can be generic and, thus, found in almost all fields or areas of research. Alternatively, they can be specific to some study areas. Figure 8 shows the categories of limitations most often found in the literature as identified in the present SLR. It is worth noting that most categories seem generic to all research fields. Still, the following discussion highlights specific within-category gaps in fresh food and grocery channels.

As shown in Figure 8, the predominant category of limitations is missing variables or attributes in the adopted models. This limitation category is related to what is absent that would have given a better understanding of consumer behavior. For instance, Printezis and Grebitus [45] recognized the importance of including stores' other characteristics, such as quality of service and product variety, that could influence consumers' willingness to pay for products sold on a given marketing channel. Similarly, Dhaoui et al. [52] highlighted the necessity of including other variables to better understand consumers' attitudes. Other research studies point to other variables that should be taken into account, such as brand name and retailer loyalty across channels [39]; promotions, consumer dissatisfaction, and price and assortment over time [21]; the particular organizational structure of a network [35]; and the specifications of the delivery options [15].

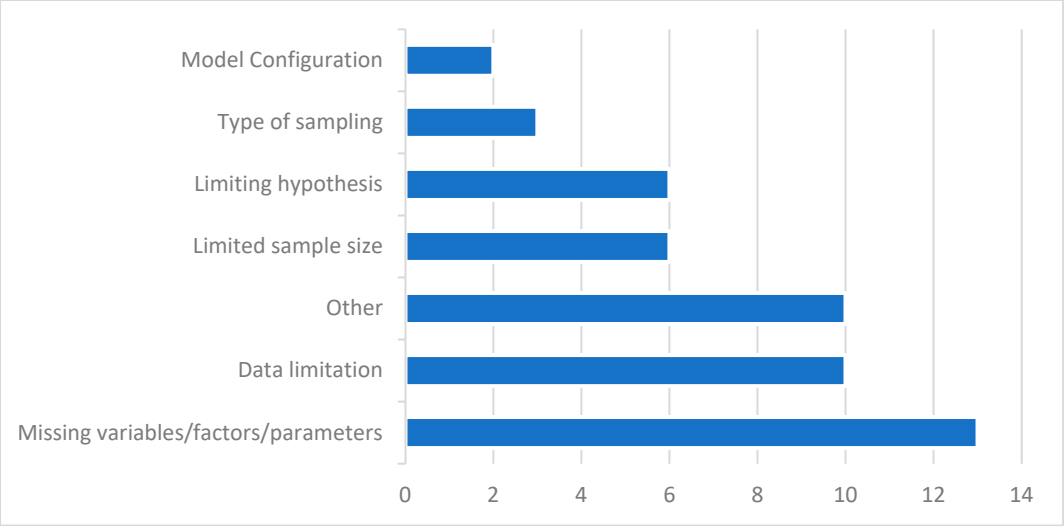

Figure 8. Number of papers per limitation type.

Another major limitation in the context of the present SLR is data limitation, followed by limited sample size. These two limitations can be found in almost all research areas. This is due to a lack of collaboration from specialized services and organizations, or due to individuals unwilling to share their information, even anonymously. These limitations also can result from researchers not sharing their data or their publications.

A limiting hypothesis can act against the expected study results. There is no doubt that researchers adopt some limiting assumptions to reduce the complexity of their model when attempting to find a solution to an important issue. However, adding model complexity by removing such assumptions would lead to better results. Hence, an SLR is important as it offers directions to work on to overcome previous limitations.

To build upon research on marketing channels in the fresh food and grocery sector, future research directions can be identified from the limitations of previous research and researchers' propositions. Some specific sub-channels have not received enough attention from researchers. In fact, out of the 36 analyzed papers, only 1 paper discusses mobile app channels as a distinctive type of channels that may have several impacts on other channels. Studies that evaluate the interaction of mobile app channels with other channels are needed in several countries. Most importantly, a cost–benefit analysis should be included to assess the profitability of this type of channel [41].

An important issue that should be extensively studied is product categories and their influence on consumers' purchase decisions [28]. Campo et al. [20] suggest measuring category characteristics such as planned products, heavy/bulky products, and sensory characteristics, while taking into account the interdependencies among the categories at a household level. Other attributes like price discounts available on online channels or promotions between channels could affect some categories of products more than others [20]. The need for future research to test this issue and to include product features (size, flavor, etc.) will lead to meaningful conclusions [20]. Studies about product categories can also be necessary to detect how online channels may affect vice purchases. Studies have found that the symbolic presentation of products on online channels reduces the number of vice purchases compared to physical stores [60]. However, more investigations should be performed as consumers can purchase vice products apart from their usual grocery purchases [60].

Following the investigation made through this SLR, a dominant aspect that is noticed in most of the studies is that all models used are static and do not allow for evolution over time. Several researchers have called for the use of dynamic modeling and the inclusion of various attributes to better understand drivers of channel choice [20,36]. More

importantly, future research needs to account for interactions between variables in the employed models [33].

Since the limited sample size of many studies presents a limitation with regard to the generalizability of results, researchers should try to overcome this limitation by offering incentives to individuals responding to their surveys. In the context of consumer behavioral studies, large samples are needed to obtain fruitful conclusions that could be helpful for grocery retailers, including those adopting online or offline channels, or both, via the adoption of multichannel or Omni-channel strategies. Similarly, efforts should be made in promoting data sharing while publishing papers to overcome data limitation.

As a valuable extension of this research, future literature reviews in the field may consider delving deeper into the qualitative aspects of consumer behavior within the fresh food and grocery sector. Particularly, researchers could explore the customer journey and its impact on consumer channel choice. While our current review focuses on quantitative studies, acknowledging the rich insights that qualitative research can offer is essential.

6. Conclusions

A wide variety of marketing channels are becoming available to consumers in all retail areas, including the fresh food and grocery sector. The demand is different for different types of channels and influences direct operations and logistics services. Demand has an impact on consumers' choices. Thus, it is important to assess consumers' channel choice behaviors. A substantial body of the literature has addressed this topic. Still, no existing review has identified the essential elements or variables influencing consumers' choice when purchasing groceries in one of the available alternative channels. Consequently, this study performed an SLR of 36 research papers, aiming to present a solid analysis of factors impacting consumers' choices regarding online/offline channels for groceries and alternative channels for fresh food.

Exciting results were obtained from the present SLR. First, most studies examining consumer behavior toward grocery marketing channels are quantitative and use discrete choice models. Second, this review identifies the main channels from the analyzed research papers and shows that studies differentiate between sub-categories of online channels and offline channels. Online channels include HD, pick-up channels can be different depending on their pick-up point (lockers, usual markets, pick-up stations, etc.), and mobile app channels are considered in some studies as independent channels that are different from the two previously mentioned online sub-channels. Offline channels can be differentiated between conventional stores (supermarkets, hypermarkets, etc.) and proximity stores (city stores, local markets, and small retails such as bakeries, butchers, etc.) The majority of studies address consumer behavior in a comparative context between offline sub-channels and online ones. Third, a significant result reveals that attributes such as those related to price category, delivery cost, time, assortment, and socio-demographic variables are used the most in analysis and show significant impacts on consumers' attitudes. Other variables that are just as important are also proven to be significant to consumers when choosing from which channel they will buy their groceries, including convenience, service offered, and risk related to the use of online channels. Finally, several gaps were identified that limit researchers from providing more significant results, and future research directions were suggested. This review paper also discusses the important effects on the logistics and operation services of grocery retailers. It also provides an integrative framework linking the influencing factors of consumer choice with outcomes directly impacting grocery retailers' logistics services.

Although this review presents meaningful outcomes to researchers, some limitations could be overcome to obtain better results. We considered only research papers published in peer-reviewed journals. Book chapters and conference papers could also be included in future reviews, provided that a quality assessment is performed. Another limitation is that few papers included in our review discussed implications for operation services despite the strong relation between consumer behavior and this type of services. A key research

direction will be to study the influence of channel choice on the whole supply chain, thereby providing an integrated analysis that relates consumer behaviors and retailers' services.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/logistics8010011/s1, Table S1: PRISMA checklist [61].

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