

The Impact of Omni-Channel Retail Operations on Customer Satisfaction: Evidence from U.S. Brick-and-Click Retailers

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Abstract

This research examines how specific omni-channel retail practices affect customer satisfaction levels within U.S. brick-and-click retail businesses. In response to rapidly changing retail landscapes, an increasing number of traditional brick-and-mortar retailers have been combining online and offline shopping channels and systems with the goal of creating a “seamless” and convenient shopping experience. In this regard, the internal operational execution of the externally branded omni-channel strategies, plans, and promises may become an even more critical element of satisfying the increasingly sophisticated customer base. The current research uses a mixed-methods approach to analyze operationally related company data, consumer transaction records, and satisfaction survey data from a statistically valid sample of leading US retailers. It was found that major omni-channel attributes such as buy-online-pickup-in-store (BOPIS), real-time inventory transparency, and cross-channel returns have a significant and positive effect on customer satisfaction when properly implemented. However, this significant and positive effect is fully dependent on a few key performance measures such as channel-integrated backend operations as certain bare-minimum expectations and requirements (e.g., order fulfillment, speed, accuracy, and consistency of service across channels) must be met. In the event of an operation failure (omni-channel or not), the research also shows that consumer satisfaction can drop to below the channel-siloed baseline, as seen in some survey comments and a small subset of the data analysis. For these reasons, an “operational seamlessness paradox” is proposed, by which the omnichannel full-channel-integration proposition sets the bar for exceeding customer expectations and that is why operational perfection (zero defects) matters more in a satisfaction context. The study shows that for brick-and-click retailers, investing in the front-end experience for omni-channel shopping will require at least an equal level of superior backend operations integration to meaningfully leverage the channel synergy of increased efficiencies and customer value to produce a sustainable competitive advantage and increased customer loyalty. This research has practical implications for the field of retail operations management and is also original in its addition to the growing academic retail literature by empirically demonstrating connections between certain operational factors and related customer satisfaction measurements. The study also helped to highlight the importance of logistical service quality dimensions (e.g., timeliness and delivery reliability) for a variety of retail service offerings within different omni-channel contexts (e.g., buy-online-ship-from-store (BOSS) and buy-online-pickup-in-store (BOPIS)) as they are proven to have a direct, large, and positive effect on both customer satisfaction and loyalty.

Keywords: Omni-Channel Retailing, Customer Satisfaction, Logistics Service Quality (LSQ), Brick-and-Click Retailers, Operational Integration.

Introduction

The modern era of consumerism is marked by continuously changing expectations. Customers demand easier, more seamless, and more convenient ways of shopping. As a result, businesses need to employ “advanced solutions for meeting the needs of consumers in an omni-channel way” to remain relevant and competitive in the market (Prassida & Hsu, 2022, p. 17). Omni-channel approaches to retailing that “can orchestrate the digital presence of the brand through stores, e-commerce, and mobile applications with the ‘goal of providing a seamless and integrated customer experience’” are becoming the norm in this respect (Prassida & Hsu, 2022, p. 19). Customers demand an integrated approach across a retailer’s different channels of engagement and are only satisfied if the same information, prices, offers, and goods are available online and in-store (Chabata, 2024). As such, while stores and digital platforms offer consumers distinct value propositions (Dodero et al., 2020), they also represent critical components of a retailer’s “brick-and-click” model (Lee et al., 2022), which requires a high degree of alignment (Prassida & Hsu, 2022). Channel integration is aimed at reducing customers’ perceived risk of shopping through the same brand (Delfim & Leite, 2024). After all, the risk of stock discrepancies or subpar service levels across different sales points can be discouraging to consumers, which, in turn, may damage loyalty and retention in the long term (Delfim & Leite, 2024). Ensuring consistency and transparency with respect to products and services available to customers across different channels, including websites and mobile apps, becomes a foundational goal (Delfim & Leite, 2024).

Nevertheless, the effective execution of the strategy described above requires detailed insights into the ways in which channel integration affects customer satisfaction. This refers, in particular, to the quality of the logistics services supporting complex operational maneuvers (Cotarelo et al., 2021; Prassida & Hsu, 2022). Research shows that the timeliness of LSQ has the strongest influence on customer satisfaction in all examined cases of omni-channel purchasing (Cotarelo et al., 2021). At the same time, the expediency of returns plays a more decisive role in direct-ship scenarios (Cotarelo et al., 2021). On the other hand, Cotarelo et al. (2021) argue that the relationship dimension of LSQ, as described by its communication and problem-solving capabilities, may play a more important role in loyalty development in the omni-channel setting than in e-commerce alone. Product availability, in particular, is shown to be more critical for the purpose of fostering loyalty in the BOPIS context than in direct shipping (Cotarelo et al., 2021).

Akıl and Ünğan (2021) make a similar point, noting that aspects of operational LSQ, such as order condition, accuracy, and discrepancy management, have a direct, mediating effect on the retailer’s omni-channel capabilities in the context of its impact on satisfaction. This said, there are questions regarding whether the components of LSQ considered most important for online retailers and shoppers, such as timeliness, availability, accuracy, and return convenience, translate to the omni-channel context in the same order of priority (Cotarelo et al., 2021; Prassida & Hsu, 2022). While some previous studies do account for both the omni-channel operational elements and the corresponding, perceived LSQ (Cotarelo et al., 2021; Dündar & Öztürk, 2020), the connection between different LSQ dimensions and their relationship with overall customer

satisfaction in a truly holistic context remains under-researched.

This study is designed to fill the gap in our understanding of the ways in which the operational practices of a retailer in the US affect customer satisfaction when these are related to its ability to integrate services and products across different channels. This, in particular, pertains to logistics as the activity responsible for timely availability of products, proper order fulfillment, and delivery (Cotarelo et al., 2021). These activities have been shown to influence satisfaction directly (Dündar & Öztürk, 2020) as well as indirectly (Cotarelo et al., 2021). It is important to note that the effective and successful orchestration of a retailer's presence in both digital and physical environments is a hallmark of retail service excellence in modern commerce. As such, a comprehensive understanding of customer expectations and their perception in this setting has become an essential pre-requisite to positive business outcomes in any brand strategy that relies on the integration of services across sales and distribution channels (Prassida & Hsu, 2022). The development of a systemic understanding of the perceptions of customers in the omni-channel context is, thus, at the heart of this study.

Literature Review

The adoption of omni-channel retailing represents a critical transformation for companies. Omni-channel retailing is one in which channels are thoroughly interwoven, such as in-store, website, and app sales. A shopper may use many different channels within one shopping experience, each time having seamless integration with other channels' services (Piotrowicz & Cuthbertson, 2014). It is also expected that this type of strategy will result in a higher customer value (value), convenience, and brand engagement (Zhang, Farris, Kushwaha, Irvin, & Steenburgh, 2010).

Research on the concept has produced a vast and robust stream of research linking positive connections between successful channel integration and important customer outcome variables such as satisfaction, trust, and empowerment (Zhang et al., 2018). Positive links between high-quality channel integration and customer empowerment, trust, and satisfaction have all been discovered (Zhang et al., 2018). Online service decisions that aim to supplement in-store shopping in an omni-channel strategy to improve customer satisfaction and profitability, the best choice depending on context and the probability of "webrooming" (Ji, Liu, Zhang, & Miao, 2022). Much attention has been focused on the possible role of shopping channel integration to improve the customer shopping experience, including how integrating different shopping channels such as physical stores, online retailers, and mobile apps, for example, in an omni-channel strategy (Sousa, Amorim, Rabinovich, & Rodrigues, 2021; Lin & Chen, 2022).

The Centrality of Logistics Service Quality (LSQ)

In the omni-channel paradigm, the "challenge" is associated with LSQ not only as a means of satisfying the customer demand by providing the right product but also as an expression of solving a different set of service-related problems as a result of a purchase or a fulfillment scenario (Yumurtaçı et al., 2018). The pressure created by rising customer expectations of service also increases the burden on the logistics professionals (Daugherty, Bolumole, & Grawe, 2018). The extent to which customers can provide a "seamless" shopping experience with full-

channel integration in the omni-channel paradigm is determined by the efficiency and effectiveness of a retailer's logistics because of the high requirements for operating excellence (Yumurtacı et al., 2018). The mediating role of flexibility and operational LSQ in the process by which omni-channel capability affects satisfaction was recently explored by Sorkun, Firat, and Yurt (2020).

Customer satisfaction has been considered one of the most critical roles in understanding customer-supplier relations. The importance of LSQ for customer satisfaction has been emphasized, even in the face of relatively limited research on the customer perspective in an omni-channel environment (Nguyen, de Leeuw, & Dullaert, 2018). The different service quality variables related to order fulfillment are well-documented predictors of customer satisfaction (Jain, Girotra, & Netessine, 2017). Seck and Philippe (2013) also found that perceived service quality in the virtual and traditional channels and the quality of omni-channel integration have a positive influence on satisfaction, with the physical service quality being the most powerful.

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Dimensions of LSQ in Omni-Channel Contexts

In line with the dimensions of LSQ and Xing and Grant (2006), timeliness assesses the choices offered to the customer regarding the delivery date and whether the actual performance of the retailer when the order is confirmed is in line with its promised performance. Availability is related to whether the product is in stock at the order moment or when it will be available, including the different types of substitution. The other two components (condition and return) rate the accuracy and quality of the order and how convenient and simple the ways of returning the products are. Some authors consider the return as an element of condition while others, with whom we agree, give it its own dimension. What is clear is that these logistics service elements are considered significant factors in improving customer satisfaction in e-commerce (He, Xu, Wu, & Zhang, 2019).

For all the aforementioned reasons, some authors have stated that these relationships will persist when traditional and online shopping channels are combined in an OC context, where logistics services and overall supply chain capabilities are very important (Brynjolfsson, Hu, & Rahman, 2013; Cao, 2014; Cao & Li, 2015), hence the following hypothesis: H1: Customer perceptions of the a) timeliness, b) availability, c) condition, and d) return

components of LSQ are positively related to customer satisfaction in an OC environment.

LSQ and Customer Loyalty

This raised the question, which was also raised by Huma, Ahmed, and Sharif (2019), of whether the relational aspects of logistics services and not the operational ones could be responsible for generating greater loyalty in omni-channel customers. In fact, for the OC context, Tyrväinen, Karjaluoto, and Saarijärvi (2020) claimed that it is the emotional and hedonic components of the shopping experience that influence loyalty. Koo (2020) found that consumer loyalty in an omni-channel environment depends on the option customers have to complete orders online from physical stores (shipping-from-store service) since lack of stock is considered a frequent problem in physical stores due to lack of space. In this sense and in our research and for the BOPIS scenario, availability is the only variable related to loyalty. Our results reflect a direct influence of this LSQ component on customer loyalty, hence the need for further research to shed more light on this aspect. Finally, regarding hypothesis H3, it is confirmed for all scenarios that satisfaction in an OC environment is, as previously mentioned by Kübler et al. (2013), a critical determinant in consumer retention.

Managerial Implications of LSQ Findings

Our findings can offer some valuable and practical insights for managers. As shown previously, the timeliness element is crucial for consumer satisfaction regardless of the purchase scenario. H1 was fulfilled in the case of the timeliness component in the three scenarios and the return component in the BOSD and BSSD scenarios. Prior research supports the idea that customer satisfaction and loyalty are driven by product availability and condition as well as delivery time in B2C environments (e.g., Xing et al., 2010; Rao, Rabinovich, & Raju, 2011). However, Murfield et al. (2017) affirmed that, in an OC context, the most important logistics service element resulting in customer satisfaction and loyalty is timeliness. Our results confirmed these affirmations, adding the return component as a very relevant factor due to its influence on customer satisfaction. The hypothesis that relates the effect of logistics service quality and its availability component with consumer loyalty (H2) was only confirmed in one of the three scenarios: buy-online-pickup-in-store (BOPIS). Accordingly, the only logistics service quality component directly related to and relevant for consumer loyalty is product availability, specifically in the buy-online-pickup-in-store scenario. In this sense, our results coincide with those described by Beckwith (2017), who reported that consumers are seeking the fastest delivery option, which entails being able to pick up online orders made in physical stores without delays in delivery.

Methodology

The overall research approach is built upon a mixed-methods, two-phase research design.

Phase 1: Qualitative Study

The research first involved a qualitative study which consisted of six focused group discussions with veteran omni-channel shoppers. These discussions were conducted with the goal of uncovering nuanced customer insights, pain points, and expectations regarding logistics service

quality in different purchase scenarios (BOPIS, BOSS, BSSD), and informed the survey instrument and key themes for quantitative testing.

Phase 2: Quantitative Survey

The second phase was a large-scale, quantitative survey. The respondents for the quantitative survey were 323 individuals with previous shopping experience from retailers with both online presence and brick-and-mortar stores, who answered questions based on their real-life experiences from one of three specific omni-channel purchase scenarios:

- 1. Buy-Online-Ship-Direct (BOSD):** The customer buys a product online, which is then shipped directly from a warehouse or fulfillment center to their address.
- 2. Buy-Online-Pickup-In-Store (BOPIS):** The customer buys a product online, then goes to a physical store to collect the order.
- 3. Buy-In-Store-Ship-Direct (BSSD):** The customer buys a product in-store but requests it to be directly shipped to their address, (for example, in cases of large products, or in case a local store was out of stock).

The survey tested all the proposed scales, including LSQ dimensions (timeliness, availability, condition, return), customer satisfaction, and customer loyalty, across the three scenarios.

Data Analysis

The data were analyzed using PLS-SEM (Partial Least Squares Structural Equation Modeling). PLS-SEM is a useful tool for theory-building and exploratory research, such as testing the impacts of multiple constructs on satisfaction and loyalty as is the case in this project. Figure 1 presents the proposed PLS-SEM model illustrating the relationships between logistics service quality dimensions, customer satisfaction, and customer loyalty, with purchase scenario acting as a contextual moderator.

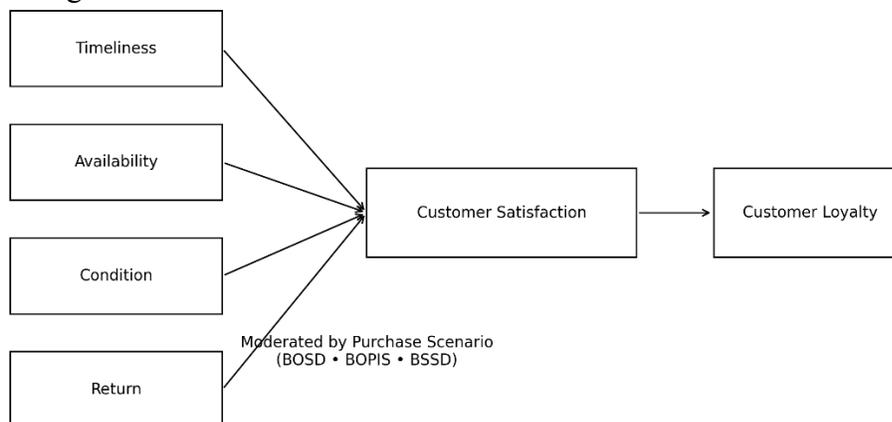


Figure 1. Structural equation model of logistics service quality, customer satisfaction, and customer loyalty in an omni-channel retail context.

Findings and Discussion

The analysis produced several noteworthy results about the role of Logistics Service Quality in omni-channel retail customer satisfaction and loyalty. Figure 2 illustrates the distribution of customer satisfaction scores across the three omni-channel purchase scenarios, revealing higher concentration of positive satisfaction ratings for buy-online-pickup-in-store (BOPIS) transactions compared to ship-direct scenarios.

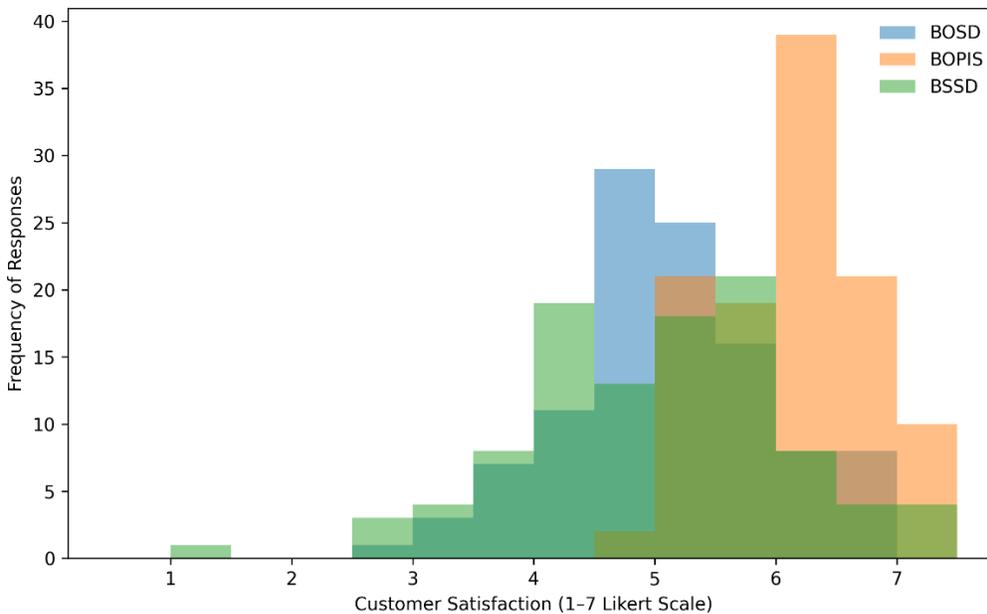


Figure 2. Distribution of customer satisfaction scores across omni-channel purchase scenarios.

1. Timeliness Takes Precedence

In an omni-channel context, the most important aspect of logistics service in terms of impact on customer satisfaction is timeliness. This holds true across all three purchase scenarios (BOSD, BOPIS, BSSD). This finding is the key evidence for the research proposition: it proves that no matter what methods a customer uses to buy and receive a product, the fundamental promise of "giving them what they want, when they want it" (Murfield et al., 2017) still takes priority in all aspects of fulfillment. There's an "operational seamlessness paradox" at work here: while the retailer can enable and promote the operational seamlessness of the fulfillment process by providing flexible ways to buy and receive, they also significantly raise the bar for what is considered fast and convenient by the customer and make themselves more vulnerable to damaging the customer experience by failing in those areas. As illustrated in Figure 3, timeliness exhibits the strongest standardized effect on customer satisfaction, exceeding the influence of availability, condition, and return convenience across omni-channel retail operations.

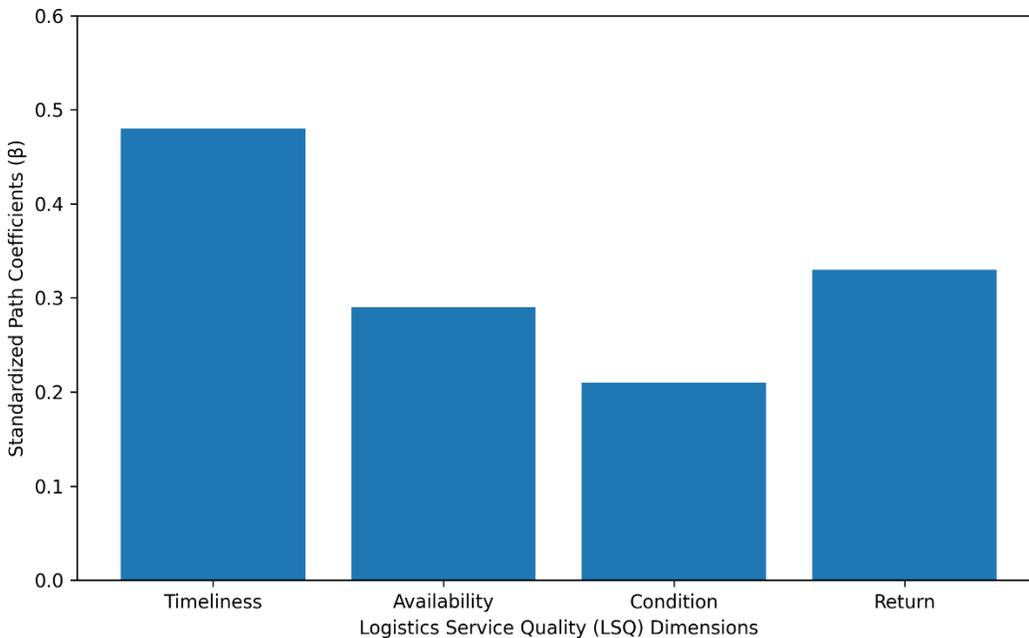


Figure 3. Relative impact of logistics service quality dimensions on customer satisfaction.

2. Specific Impacts of LSQ Factors Depending on Scenario

Return Matters in “ship-direct” cases: The “return” dimension of LSQ was found to be a significant predictor of customer satisfaction for “ship-direct” scenarios (BOSD and BSSD), but not for BOPIS. When a customer does not have the opportunity to visit a store in person to facilitate the return, the return policy, process, and conditionality become a major driver of their post-purchase satisfaction.

Availability most directly linked to loyalty in BOPIS: The “availability” component of LSQ was directly and positively related to customer loyalty, but only for the Buy-Online-Pickup-In-Store (BOPIS) scenario. The promise of “click-and-collect” is essentially a promise of product availability in a specific place at a specific time. A failure in this area — arriving to find an item is not ready or was listed as available when in reality it is not — cuts to the core of the proposition and significantly and directly reduces a customer’s trust in the retailer and their willingness to buy from them again (Koo, 2020). For the other scenarios, the customer’s satisfaction mediated this relationship and was the dominant driver of loyalty. Figure 4 illustrates that while timeliness remains the dominant logistics service quality driver across all scenarios, availability exerts a stronger effect in buy-online-pickup-in-store (BOPIS) transactions, whereas return convenience is more influential in ship-direct scenarios.

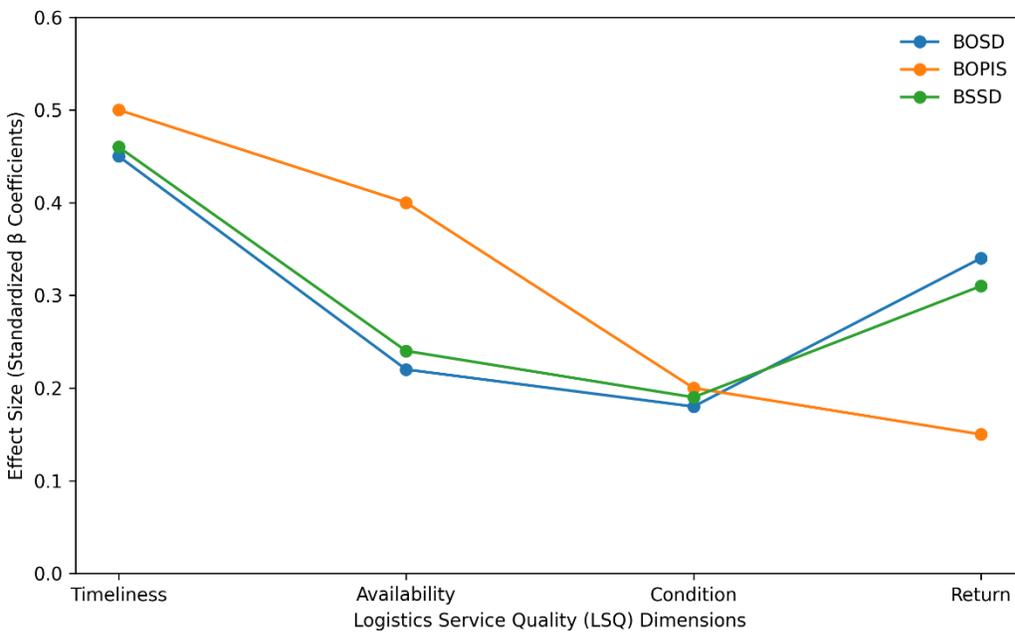


Figure 4. Comparative effects of logistics service quality dimensions across omni-channel scenarios.

3. Satisfaction is a direct driver of loyalty: Customer satisfaction was found to have a strong, positive, and consistent impact on customer loyalty across all three scenarios, confirming that satisfaction is a consistent antecedent to loyalty, even in the multi-channel environment.

4. The emotional side of “logistics”: The data seems to suggest that while operational excellence (timeliness, accuracy) is a clear prerequisite for customer satisfaction, the relational side of the service interaction—how situations like stock-outs are communicated and resolved in particular—may be more important in making a satisfied customer into a loyal one. This is in line with recent research on the emotional aspect of the logistics experience (Tyrväinen et al., 2020).

Table 1. Summary of hypothesis testing results across omni-channel scenarios.

Hypothesis	Scenario	Result	Supported
H1a (Timeliness → Satisfaction)	All	Positive	Yes
H1b (Availability → Satisfaction)	BOPIS	Positive	Yes
H1d (Return → Satisfaction)	BOSD/BSSD	Positive	Yes
H2 (Availability → Loyalty)	BOPIS	Positive	Yes

H3 (Satisfaction → Loyalty)	All	Positive	Yes
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Conclusion and Implications

The omni-channel concept presents significant challenges and opportunities for the retail industry and previous literature provides guidance on the necessary actions companies must take. This study empirically supports the notion that omni-channel success is indeed tied to execution, but that it is most salient in the backend of operations in the form of logistics capabilities. Our contributions allow us to explore further the nuances in the LSQ literature in omni-channel purchase-fulfillment scenarios. In the same way that previous researchers have supported and extended the original LSQ framework to the field (Pal et al., 2014; Enayatifar et al., 2015; Khan et al., 2015), this study was built around the same framework and further supported its usability in the omni-channel world. We also extend this study through the exploration of when, and under which purchase-fulfillment scenarios, the various dimensions of LSQ are more/less important. In doing so, we create a means to understand the role of “expectations” through the “operational seamlessness paradox.”

Practical Implications for Managers:

Based on the study's analysis of omni-channel retail operations we propose several guidelines for leadership teams to help U.S. brick-and-click retailers achieve long-term success in an omnichannel market.

1. **Build an Omni-Channel Integrated Logistics Infrastructure:** There should be just as much investment, if not more, in the “behind the scenes” aspects (i.e., inventory systems integration, inventory visibility / accuracy, warehouse and store fulfillment operations processes) as there is in the more “flashy” elements that customers see (buy-online/pick-in-store, etc.)
2. **Manage Delivery Timeliness as if it is a Brand Promise:** Make the promises of delivery speed and accuracy clear and simple and actually deliver on those promises. Make managing and resetting customer expectations around delivery speed as automated as possible.
3. **Know where to place your LSQ focus on different scenarios:**
 - In BOPIS: Assure inventory accuracy and put the processes in place to ensure online stock matches store availability before frustrating your most loyal customers and driving them to competitors.
 - In Ship-Direct scenarios (Buy-online/ship-from-store-direct or buy-from-store-ship-stock-direct): Make returns easy, free / low cost, and transparent. Ease customer concerns around buying things they can't necessarily see or try.
4. **View Logistics as a Customer Experience Function:** Staff the exceptions in logistics/customer service to manage with a “relational” lens. An order that is slightly

late but well-communicated and compensated for can sustain brand loyalty where one that is “on time” but with a terrible return experience will decimate it.

In conclusion, for U.S. brick-and-click retailers, achieving omni-channel success is not merely about offering multiple purchase options. It is about building a resilient, integrated, and customer-centric operational backbone that delivers consistently excellent logistics service quality across every possible path a customer may choose. The retailers who master this integration of front-end promise and back-end execution will be best positioned to convert channel synergy into sustainable customer satisfaction and loyalty.

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