COVID-19 and Retail Grocery Management: Insights From a Broad-Based Consumer Survey

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Abstract—*The grocery retail industry is encountering unique challenges and opportunities during the 2019 Novel Coronavirus (COVID-19). The pandemic led to various transformations in the food retail industry, including changes in consumer perception and behavior. Although the pandemic has a situational nature, these transformations could have both temporary and long-lasting effects on reforms of the grocery retail industry. We examined consumer retail grocery shopping behavior change during the pandemic using a national survey among 2500 U.S. adults. Survey results show that consumers now have higher expectations for in-store safety; they have reduced the frequency of store patronage, travel time, and in-store duration; they have shifted from regular shopping schedule and shopping destinations; and they have spent more per shopping trip. The increased spending at brick-and-mortar stores also paralleled with the expanded transactions across various types of online grocery shopping platforms. We further arrived at practical managerial implications in both the short term and long term for brick-and-mortar stores as well as online grocery vendors.*

Key words: Consumer behavior, novel coronavirus (COVID-19), food retail, grocery shopping, online grocery shopping platforms

I. PANDEMIC AND GROCERIES

AFTER arriving in the U.S. in early 2020, COVID-19 quickly spread across the nation. The highly infectious and contagious nature of the virus disrupt consumer retail shopping behaviors, precipitating an unprecedented reformation of this industry and its supply chains [Kim, 2020]. Nearly one-third of consumers spent more on groceries [Everett, 2020]; simultaneously consumers have expanded beyond in-store grocery shopping to online platforms, such as Amazon Fresh and Instacart.

Few studies have documented how consumer offline and online grocery shopping patterns have changed during the COVID-19 crisis, how business owners and managers should react to such changes, and what changes are likely to remain after the crisis ends. We provide a summary of potential short-term and long-term changes in the grocery retail industry as a result of COVID-19 from the perspective of business, consumer, and employee perspectives in Table 1.

A part of crisis response authorities and health experts are introducing and enforcing social distancing regulations. They also suggest consumers take fewer and shorter grocery trips, focus on necessities, and remain socially distant in the stores. Many of the current consumer practices and policy implementations are based on assumptions of only short-term transformation and knowledge that is germane to “normal times.” However, as summarized in Table 1, the impact of COVID-19 can also endure and change behavior, expectations, and business practices of retail businesses, consumers, and employees in the long run.

How business needs to adapt and design to a new *normal* and create a better retail environment both offline and online to maintain business performance in the long run has become an important and timely question for the food retail business around the world. Some of the insights from this work may also extend to other service-based industries that require customer involvement, such as healthcare, law, and education.

There is limited understanding on how consumer grocery shopping behaviors have shifted due to COVID-19, or how consumers and retailers can collaborate to facilitate efficient and safe shopping experiences amid the evolving pandemic. With these questions in mind, we consider: (1) how consumer in-store grocery shopping behaviors have changed before and after COVID-19 in terms of the location, timing, distance, frequency, transport mode, and expenditure of grocery shopping trips; and (2) the consumer shift to online grocery shopping in response to COVID-19. We examine managerial and organizational implications for adapting to a postpandemic era as well as future disruption possibilities.

II. Methodological Approach

To better understand how consumer grocery shopping behaviors in terms of the location, timing, distance, frequency, transport mode, and expenditure have changed during COVID-19, we surveyed over 2500 U.S. consumers on their grocery shopping behaviors during COVID-19. In the survey, we also asked the participants to recall their grocery shopping trips in the last year as a comparison to the status quo. The web-based survey was launched via Amazon Mechanical Turk and ran from April to May 2020, when COVID-19 was spreading widely in the U.S. and consumers were forced to change their grocery shopping patterns.

The survey asked comprehensive questions on consumer grocery shopping practices and perceptions during and before COVID-19. Consumer offline grocery shopping questions were asked concerning location, timing, distance, frequency, transport mode, and expenditure during the most recent shopping trip; the survey also solicited consumer online shopping experiences during COVID-19. Complete answers from 2429 respondents who passed the *attention check* questions were recorded and analyzed. A total of 42.57% of the survey respondents were female, with 43.64% in the age group of 25–34 years old. A total of 70.81% of the respondents were Caucasian, 14.24% were African American, 6.67% were Asian, and 5.35% were Hispanic. A total of 58.67% of the respondents declared being married or in a domestic relationship, 74.76% reported having a two-year, four-year, or a graduate degree, 65.71% reported that they were employed for wages during COVID-19, while 44.75% declared an annual income of \$40 000–\$80 000 during the fiscal year 2019.

Table 1. Short-Term and Long-Term Issues Facing Post-COVID-19 Grocery Retail Industry.

	Retail business	Consumer	Employee
Short term	1. Risk of interpersonal interaction	1. The increasing need of cooking-at-home	1. General risk of working frontline and interpersonal interaction
	2. Lacking PPE and disinfection supplies	2. Fewer grocery choices due to risk of consume imported fresh produces	2. Lacking PPE supplies
	3. Lacking frontline employees	3. Inflated grocery prices across the country to reflect increased stores operational costs, [Everett, 2020]	3. Have to work extended hours
	4. Broken international supply chain lead to stocking issues and price inflation on popular items such as PPEs and paper products	4. Inflated price on PPE supplies	4. Capability to receive subsidies to compensate for increased health risks [Moody, 2020]
	5. Temporarily losing consumers to competitors	5. Risk of interpersonal interaction	5. Stress about hearing diagnosed case among colleagues [Bhattarai, 2020]
		6. Temporarily switching to another store for convenience and security	6. Consumers may generate special needs and expectations due to the pandemic
Long-term	1. Improve stores' safety standards, including food safety monitoring	1. Expect safer in-store environment [The Capgemini Research Institute, 2020]	1. Automated workplace leads to the employment challenge
	2. Store layout change to ensure sanitation and safety	2. Expecting mobile-based self-checkout systems; and self-shopping experience [The Capgemini Research Institute, 2020].	2. Crave a safer working environment
	3. Consumer behavior and expectation change	3. More chances to work-from-home	3. Consumer expectation and behavior change
	4. Employee behavior and expectation change [Bayram & Ünğan, 2018]	4. Growing reliance on online grocery shopping	
	5. Online grocery business as threat and opportunity		

We condensed our findings into two primary topics: (1) consumer grocery shopping in-store changes before and during COVID-19; and (2) the beginning of a long-term transition to online grocery shopping during COVID-19. For each topic, we summarize the survey findings, derive possible rationale behind such changes and differences, and generate managerial implications for future business operations and design issues accordingly.

III. Consumer's Grocery Shopping In-Stores Changes Before and During Covid-19

A. General Changes in In-Store Grocery Shopping

Here, we examine changes in consumer grocery shopping frequency, time, duration, and expenditure before and during COVID-19.

Shopping Frequency. Survey respondents reported that they reduced the frequency of grocery shopping trips since the pandemic outbreak—as shown in the upper half of Figure 1. Before COVID-19, the most common shopping frequency was "2–3 times per week." This frequency decreased to "once per week" during COVID-19. Even with more flexible daily schedules, consumers reduced grocery shopping trip frequency during COVID-19.

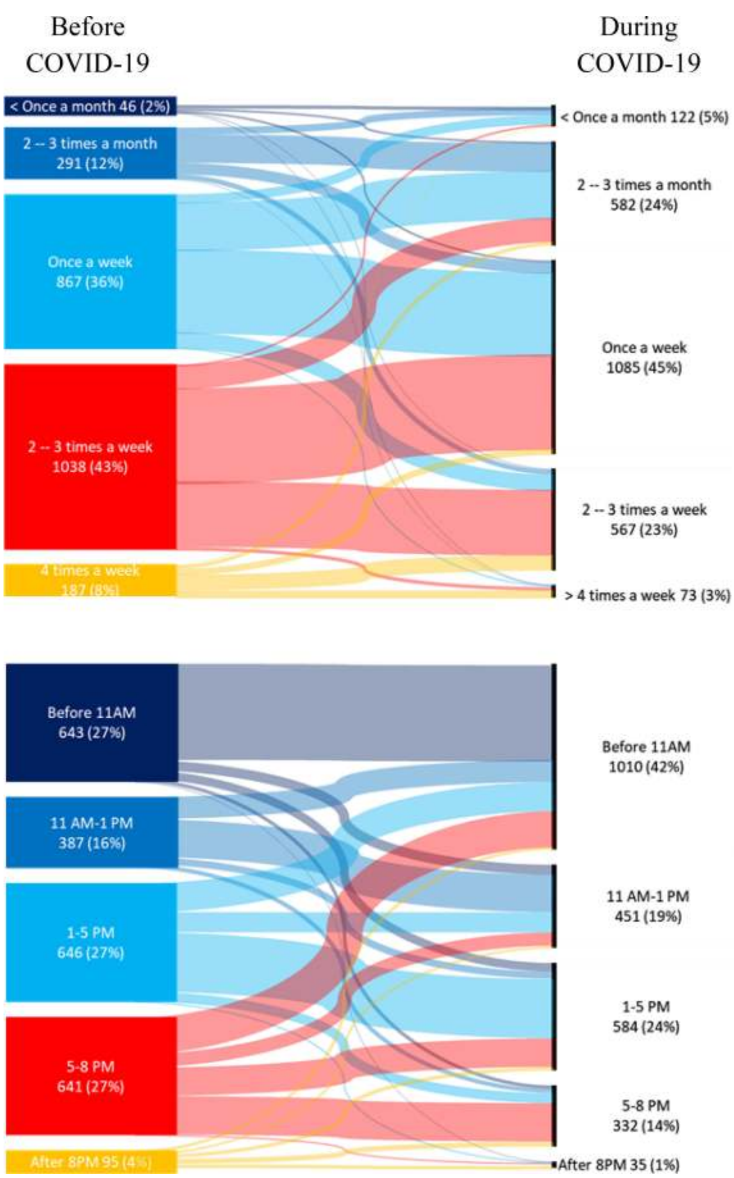

Figure 1. Sankey diagram of grocery shopping frequency and time change before and during COVID-19.

Shopping Time of day. The bottom half of Figure 1 illustrates the time of day when consumers elected to shop. Before COVID-19, the most common shopping times were in the afternoons (1–5 P.M.) and evenings (5–8 P.M.). These time windows shifted to shopping in the morning (before 11 A.M.) during COVID-19. Such changes reflect how the pandemic is reshaping daily life by allowing more people to work from home (WFH).

Shopping Duration. We also examined the duration of consumer grocery shopping after and before COVID-19. Our results show a significant reduction in respondent in-store time—consumers spent 30.98 min shopping in-store during COVID-19, which is about 8 min less ($p < 0.01$) than that before the pandemic.

Expenditure. Survey respondents reported a significant increase in their expenditure per grocery shopping trip—consumers spent \$132.21 per each grocery shopping trip during COVID-19, which is about \$12 more ($p < 0.01$) than that before the pandemic. The changes in the duration and expenditure arise from negative perceptions of in-store safety precautions, as the survey results reveal that consumer in-store safety perception dropped significantly ($p < 0.01$) from 4.65 (before COVID-19) to 3.75 (during COVID-19) on a five-point Likert scale measure. These results occurred despite an increase in prevention measures and consumer self-protection measures during the pandemic.

We observed no major differences in grocery shopping frequency, time, duration, and expenditure based on consumer socio-demographic characteristics. The insignificant differences indicate that consumers in general altered their in-store grocery shopping behavior to reduce the frequency of grocery shopping trips, advanced their grocery shopping hours, reduced the duration of in-store stay, and increased per trip expenditure.

These behavior modifications require attention from the food retail industry taking more strategic mitigation plans to regain consumer confidence in in-store shopping. It also means various operational and design issues that will need to be considered in future management and design of stores.

While some of the COVID-19 impacts are immediate and short-lived, there may also be some fundamental impacts transforming consumer behaviors and expectations over the long run. Based on our findings, we propose the following managerial implications for the food retail industry and operational issues.

Daily Store Operation and Scheduling: Changes in consumer behavior mandate that daily store operation and scheduling may transform in the long run. The tendency of WFH allows increased flexibility in everyday scheduling, which, in turn, allows for more flexible grocery shopping hours.

The pandemic has made more companies—such as Facebook and Twitter—aware that implementing WFH is a viable and cost-effective way of business operations. These WFH transitions will likely be permanent for a significant portion of the future work force [Berliner, 2020]. White-collar workers are very likely to customize working locations and hours in the near future. Grocery shopping hours will likely remain—mostly in morning—even after the pandemic *in the long run*. This result suggests that store managers should take initiative to monitor and adapt to more favored store operating times in general to make sure new store hours fit local consumer lifestyle.

For example stores should prepare for more stocking and staffing in the morning to adapt to the earlier opening and peak hours. Restocking, maintenance, and staff reductions may shift to the afternoon as opposed to late night. They could also close earlier in the evening to allow for comprehensive cleaning. Much will be dependent on how well WFH is adopted in the long run.

“Self-shopping solutions” by redesigning the store layouts: As consumers’ need of in-store safety increases, they spend less time in-store and prefer fewer personal interactions during the pandemic. *In the short run*, store managers may incorporate quick “self-shopping solutions” by redesigning the store layouts. For example, equipping store maps at consumers’ convenience, directional floor arrow stickers, or self-direction screens in the store.

If available, *in the long run*, retail cooperates should develop mobile-compatible platforms to inform consumers about the real-time inventory and the item location on the shelf. Currently, many stores have electronic apps. These apps may not have real-time stock information or cannot be operated smoothly in-store due to weak Internet connections. Such apps should either be able to self-refresh at the store entrance using special technology—e.g., Beacon technology—or the store needs to provide improved Internet connection resources to allow for better store app operations.

Another technological requirement in retailers should provide contactless payment options such as mobile payment using PayPal and Apple Wallet. The cashier-less store could be another option. Cashier-less stores utilize sensors and cameras to track what consumers put into their shopping carts, weigh them, and calculate the total payment.

Consumers will be charged through mobile payment systems. Amazon is test-marketing cashier-less Go stores in Seattle, WA, USA. Note that such stores require a large investment from the retailers and have been stumbling overseas; therefore, managers should practice it with caution.

Redesign building layout to meet consumer increasing in-store hygiene expectations: Grocery stores should likely redesign current building structure and layout to meet increasing consumer in-store hygiene expectations.

During COVID-19, most grocery retailers increased disinfection and social distancing requirements. Operational activities such as installing clear glass checkout counter barriers, wiping down shopping carts, and restricting store capacity. All these tactics are *temporarily effective* in containing the virus. When the costs of labor (e.g.. employees to disinfect carts, monitor consumer flows), supplies (e.g., plexiglass barrier, disposable wipes), and equipment (e.g., electronic monitoring devices) are factored in, such practices could become cost-ineffective and unsustainable over time.

In the long run, retailers should establish a sustainable and comprehensive system to manage consumer health and prepare for possible tracing. For example, stores may consider building an all-in-one management system to incorporate antishoplifting detection, infrared body temperature detector, automatic shopping cart cleaning, and traffic counting when consumers pass through the entrance. The all-in-one systems will work efficiently to ease consumer safety concerns—which may remain even after the pandemic eases. These systems can also serve effectively for epidemic or other health tracing when needs arise, and eventually, will boost both consumer and employee confidence in safety and health perceptions.

Many grocery retailer facilities are currently designed with a closed environment in mind—such as limited fresh airflows in stores. Scents and smells from fresh produce and poultry products are usually not ideal and may lead to more safety concerns [Goldkuhl & Styvén, 2007]. As the virus is more likely to be transmitted via droplets and aerosols in the closed environment [Jayaweera *et al.*, 2020], consumers may prefer to shop at better ventilated facilities. Grocery retailers should consider redesigning supermarkets and stores to allow more airflow. In terms of operational budget concerns, greenery decorations, air blowers, dehumidifiers, air-purifiers, and skylights can be budget-friendly add-ons to current facility designs.

Food Safety: Grocery retailers should also escalate attention to food safety *in the long run*. Research has shown that COVID-19 is more likely to be transmitted through "food, food supply chains, surfaces, and environments" [Rizou *et al.*, 2020]. COVID-19 infection rates places employees in the food supply chain, including grocery employees, at increased health risks. Grocery store managers need to take precautions in every step of the sale, including unpacking, stocking, and delivering [Shahbaz *et al.*, 2020].

Food inspections should be more careful with imported goods because of their longer supply chain processes and greater risks of carrying the virus. Specifically, items imported from high-risk areas should be clearly labeled with potential risks of consumption and detailed food preparation guidance—this can be true for any epidemic or disease crisis situation.

Additional food preparation precautions should also be considered including: (1) using separate chopping boards for raw foods and cooked foods; (2) fully cooking meat and seafood products; and (3) washing hands before and after food processing and consumption. These actions could allow consumers to generate higher levels of perceived safety, trustworthiness, and reliability toward the food retail industry, and be more willing to commit to a food retail franchises despite their pandemic concerns.

Employee Care—As more employees express their concerns about the health risks inherent in their daily work, store managers, and policy should empathize with employees to bolster employee job satisfaction and engagement. At the beginning of COVID-19, many grocery stores failed to equip employees with personal protective equipment (PPE) and extended their work hours. Such conduct fomented employee dissatisfaction and triggered strikes around the country.

As responsible employers, *during the pandemic*, the food retail industry should equip employees with proper PPE and routinely offer comprehensive testing to allay their health concerns. Moreover, daily temperature checkups and disinfection should be prioritized for frontline employees upon their arrival and departure. Furthermore, if employees are diagnosed with COVID-19 at work, retail managers should accommodate them with empathy by providing paid leaves and health benefits.

In the long run, the food retail industry should improve current employee welfare plans and provide better care, education, and support systems to ensure employee satisfaction and reduce turn over. Better-treated employees value the organization and demonstrate higher levels of engagement, and, in turn, tend to offer more protection for the firm's core asset, the loyalty of consumers.

B. Consumer Grocery Shopping Destination Changes During COVID-19 We also surveyed changes in consumer ***grocery shopping destinations*** during COVID-19. Consumers may not purchase groceries at a single store. In terms of in-store grocery shopping destinations, our survey account for six different grocery store types, including *Local-regional chain stores*—such as Price Chopper, Stop & Shop, Wegmans, Giant Eagle, and Kroger; *national chain stores*—such as Walmart and Target; *wholesale clubs*—such as BJ's. Costco, and Sam's Club; *convenience stores*—such as 7-11, gas station food market; *ethnic food stores;* and *farmer markets*.

The *local chain store, national chain store*, and *wholesale club* are typically operated by regional and national corporations. These companies exhibit a full organizational structure, stable supply chains, established online portals, and an expansive store coverage. As these stores operate as chains, they remained open with minor changes in operating hours during COVID-19.

Convenience stores, *ethnic food stores*, and *farmer markets* are more likely to be operated by individuals or smaller groups, have relatively loose organizational structures, scattered locations, limited in-store services, and relatively fragile supply chains. A considerable challenge to the supply chain occurred for *ethnic food stores*–during COVID-19, internationally imported items took longer to transport to the U.S. due to temporary route suspensions, reduced courier capacities, and spikes in shipping rates [Plume, 2020]. Various hygiene and social distancing concerns also led to a temporary hold at import customs for at least 14 days for reorganizing and disinfection procedures.

Before the pandemic, the surveyed consumers went to 2.94 different types of stores on average; during the pandemic, the number of store types for grocery shopping was 2.42 on average. Such a difference is statistically significant ($p < 0.01$), which means that consumers significantly reduced the variety of their grocery shopping destinations.

The sharpest consumer flow drops occurred in the *ethnic food store* (47% drop) and the *farmer markets* (39%). These results are likely due to the unstable food supply chains and the voluntary closure of the privately owned businesses as a result of the pandemic. Large-scale franchise grocery stores are more likely to remain operating regularly during COVID-19 due to government regulatory requirements; small, privately operated stores are more likely to be closed or implementing new schedules, regulations, and guidance from state-wide lockdowns [Stacom, 2020].

We also arrived at four different consumer segments for each store type—as shown in Figure 2. These consumer segmentations may provide some insight into shopping store changes.

Consumers who did not shop at a store type, either before or during COVID-19, are categorized *nonconsumer*; consumers who only shopped at a store type only during COVID-19 are categorized *emerging consumer*; consumers who shopped before but avoided shopping at the store type during COVID-19 are categorized *risk-averting consumer*; and consumers who shopped at the store both before and during COVID-19 are categorized *loyal consumer.*

We found that compared with other grocery store types, *local chain stores* and *national chain stores* performed particularly well on customer retention during COVID-19. *Local chain stores* retained 92.11% of their previous consumers and the *national chain stores* retained 81.66%. We believe the high retention rates may correlate with the store accessible as well as the resilient organizational structure of large corporations.

Survey results show for travel behaviors consumers spent 16.88 min on average traveling to grocery destinations during COVID-19—half the travel time prepandemic with a 29.25 min average travel time. Consumer travel distance per trip during COVID-19 was shorter.

All types of stores could develop custom positioning strategies to accommodate needs arising from different consumers. Two general recommendations include affiliate with online grocery shopping platforms (e.g., Instacart) to reduce consumer in-store trips. The online presence could accommodate the *risk-averting consumer*. Implement promotional activities and rewards programs to show appreciation to the *loyal consumer* and retain the *emerging consumer*. Potentially provide delivery services—similar to restaurant delivery—limiting worker contagion. These efforts will require significant restructuring of systems and resources.

IV. Potential Long-Term Transition to Online Grocery Shopping

Although online business has existed for a number of decades, grocery shopping has rarely been a hotspot in the online business-to-consumer (B2C) market. COVID-19 has reshaped consumer shopping behaviors by encouraging more consumers to shop online. The Centers for Disease Control and Prevention (CDC) specifically stated to use online services when available to redirect consumer grocery trips online (CDC, 2020). There has been a significant shift from 3%–4% online grocery spending before the pandemic to 10%–15% during the pandemic (Repko, 2020). Consumers who benefit from the convenience and efficiency of online grocery may behave in this way even further after the crisis.

Consumers can procure groceries online through two main types of deliveries: *delivery to doorsteps* and *curbside pickup*. Our survey revealed that about half of the surveyed

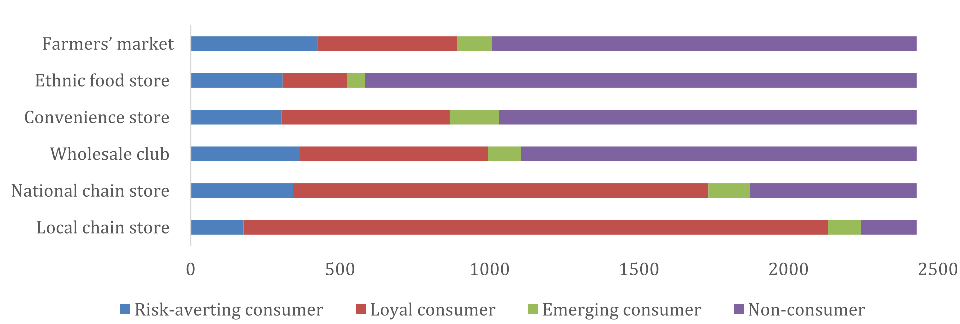

Figure 2. Distribution of types of consumers and their grocery shopping destinations during COVID-19.

respondents did not use either of these two deliveries during the pandemic. This reluctance in online grocery shopping is primarily due to service availability and coverage.

Online grocery delivery platforms such as Instacart, Amazon Fresh, and Costco one-day delivery typically only serve major U.S. cities. Consumers living in smaller towns or rural areas typically do not have access to online grocery shopping services. Consumers who do have access to online grocery shopping services frequently see “no delivery times available” and “out-of-stock” notifications for many popular items during the pandemic; especially fresh fruit and vegetables that actually may be available in regular grocery stores. Online grocery shopping can supplement but may not be able to replace all consumer grocery needs.

Health risk perception can affect consumer willingness to utilize online grocery shopping platforms. Many consumers believe that neither type of food delivery can ease the safety concerns due the human-to-human interactions during order processing or the delivery and pick-up processes. Some consumers are concerned that online grocery shopping during COVID-19 could be “unethical” as it may pose risks to store employees due to the extended food supply chain. For example, both packing and delivery personnel may be exposed to the virus due to extended personal interactions. Increasing consumer demand has led to massive new part-time hires without proper training, which further exacerbate risks to current employees and consumers. Several employee strikes arose during the pandemic due to increased workloads and deficient safety measures [Selyukh & Bond, 2020], triggering public concerns about the ethics of online grocery shopping [Masur, 2020]. Such ethical concerns may hinder consumers from making an online purchase [Desouza *et al.*, 2020]. Yet, the increase in online grocery has helped develop a larger market, that many may wish to continue.

Of the survey respondents who utilized online grocery shopping services, 1280 (52.70%) consumers reported *delivery-to-doorstep,* and 1118 (46.03%) reported using *curbside pickup* services. Higher acceptance levels for *delivery-to-doorstep* are likely due to its flexibility in retrieving the food items and the relatively contactless shopping experience. For both forms of deliveries, about half are recurring customers while the other half are new customers emerging from the pandemic; further exemplifying an expanding market for online grocery shopping.

A. Competition Between Online Grocery Shopping Destinations

We now present our findings on consumer preferences for different online grocery shopping platforms during COVID-19. Consumers did not shop for all their groceries on a single platform but tended to switch between platforms. We categorize online grocery shopping platforms into three major categories: *national grocery shopping platform* who occupied a large market before COVID-19, such as Amazon Fresh and Instacart; *grocery store online platforms*, such as Walmart and Target; and *regional grocery shopping platform*, such as FreshGoGo and FreshDirect.

As shown in Figure 3, many online grocery purchases occurred through a *national grocery shopping platform*, such as Amazon Fresh (24%) and Instacart (7.55%). Yet, many consumers purchased groceries online through a *grocery store online platform*; such as Walmart (16.43%), Costco (6.64%), and Target (6.35%). More than half of online grocery transactions happened elsewhere on a *regional grocery shopping platform*.

The online grocery business is the latest E-commerce battlefield. This situation presents an almost perfect competitive scenario. Such ideal competition is rarely seen in today’s E-commerce market where consumers are acclimated to an oligopolistic market shared by very few giants, such as Amazon, Google Shopping, and eBay. In this pandemic time, we observe a large competitive market for online grocery shopping platforms with emerging opportunities for growing entrepreneurs and established retailers to chip in.

We summarize managerial implications for the three types of

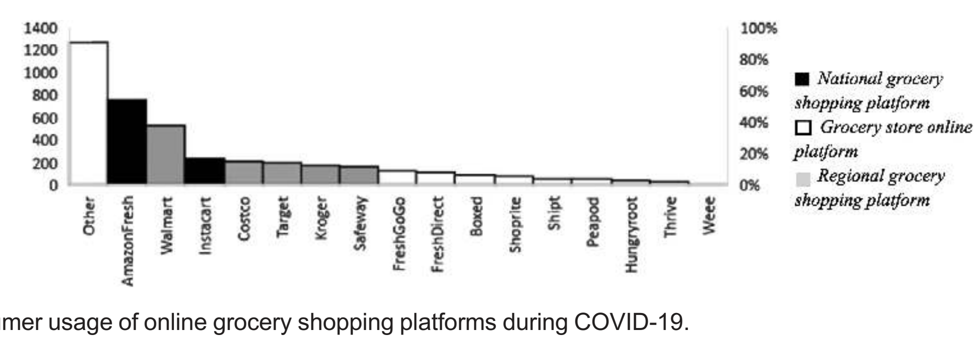

Figure 3. Consumer usage of online grocery shopping platforms during COVID-19.

online grocery shopping platforms in Table 2.

V. Summary and Thoughts

COVID-19 has substantially transformed how the food retail industry operates with both temporary and long run impacts. Retail businesses, consumers, and employees worry about in-store shopping safety due to the highly infectious nature of the virus and they have higher expectations for in-store hygiene and safety; which inform both short-term and long-term solutions.

While food is essential for consumer daily life, alterations in other aspects of consumer lives and their health concerns lead to different grocery shopping behaviors as a response to COVID-19. However, we now document these changes. This study summarizes such changes by analyzing survey data collected from 2500 U.S. consumers, documents the major in-store and online grocery shopping behavioral changes, provides possible rationales behind these changes, and proposes relevant managerial implications in short run and long run. Pandemics and major crises that will require similar behaviors are also likely to return in the future—documenting this knowledge is important.

Consumer grocery shopping patterns have shifted drastically during COVID-19. Changes in consumer grocery shopping frequency, timing,

Table 2. Managerial Implications for Different Types of Online Grocery Destinations.

Platform type and characteristics	Pandemic marketing plan	Pandemic safety conduct
National grocery shopping platform - Preestablished technological infrastructures - Pricing advantage - Large consumer base who are familiar with the platform but typically shop other categories - Sufficient funds to handle fast delivery, increasing orders, and health certification	*In the short term:* - Provide promotional discounts or rewards to motivate the original users to try online grocery shopping service - Have professionally trained employees equipped with comprehensive protection and mass testing to work on delivery jobs *In the long-term:* - Expand to smaller townships, so that more consumers have access to the service - Provide health certificates to food items, especially imported goods to ensure safety procedure - Fast delivery and freshness guaranteed to ensure consumer satisfaction - Build independent logistic system, E.g.,: Central stations in major intersections for fast delivery - Establish flexible return service for consumers who are not satisfied with items purchased	*In the short-term:* - Have frontline employees routinely tested and equipped with comprehensive PPE and respond to their concerns about health risks - Closely monitor and report food safety information for items from high-risk regions *In the long-term:* - Have appropriate training for all employees regarding online delivery services - Monitor the raw food materials (veggies, fruits, diary, and poultry items) closely, including food sources, quality, and keeping that information traceable online - Maintain transparent communication with consumers via social media, store app, and websites - Ensure that food packaging contains correct and clear ingredient information, and that the packaging is sustainable
Grocery store online platform -Large consumer base who typically shop in-store	*In the short term:* - Provide promotional discounts or rewards programs for current in-store consumers to convert in-store consumers to online shoppers - Promote pick-up services to reduce possible high demands on delivery services *In the long term:* - Facilitate online grocery shopping by affiliating with third-party platforms rather than creating its own platform to reduce the operational costs and mitigate risks	
Regional grocery shopping platform -There is a large and profitable market in which to compete - Consumers are seeking and willing to try new forms of online grocery shopping - Lacking resources for mass competition	*In the short term:* - Focus on local supply and demand by working with local restaurants, farmers, and small business owners to reduce costs, maintain food freshness, and add connection to the local community *In the long term:* - Avoid direct competition with larger firms who have pricing advantages by strategically create niche markets on a few product types. For example, freshly dried fruits and veggies; handmade cookies and shortbread, premade meals for WFH parents - Try new forms of online grocery shopping, e.g., monthly subscription of veggie/gluten-free/balanced grocery supplies with recipes - Try online grocery shopping by topics, e.g., Independence Day barbecue, Keto diet, graduation party - Adopt existing platforms instead of creating exclusive platforms may further reduce the costs of operating a new business and mitigating risk	

duration, expenditure, and their switching to online grocery shopping are all reflected in our results. These changes from in grocery shopping may be due to events that may be long-term such as work schedule and WFH events. Thus, many of these practices are likely to endure after the pandemic becoming a “new normal.” We have summarized the survey findings and proposed practical managerial implications for both offline and online retailers in terms of both the postpandemic short-term and potential long-term developments.

We have segmented the consumers for each type of grocery destination and have proposed practical tailored, practical managerial implications for different types of brick-and-mortar stores.

We have some caveats for our findings, which really require additional investigation. First, we were unable to elicit additional details for changes in consumer perceptions of grocery shopping and to help rationalize their behavioral changes in this survey. Second, while we proposed managerial implications according to the information, we gathered from the survey questionnaire and our understanding of marketing and management in general, we did not have the opportunity to conduct experiments to verify the effectiveness and efficiency of the proposed tactics; organizations and companies will have to do this and these initial findings provide some insights into potential practices. We call for future studies to explore consumer perceptions of the food retail environment and effective countermeasures to retain consumers amid the evolving pandemic situation. It will be important to see how the new normal emerges—or if practice returns to the old normal.

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