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An Empirical Investigation of Online Grocery Shopping Behaviors Based on Different Generations

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Abstract

The Coronavirus 19 (COVID-19) pandemic has significantly impacted on consumers' grocery shopping habits and lifestyles. Online grocery shopping is one of the promising ways to have little contact as well as increase convenience. For this reason, the sales and revenues of online grocery shopping have been dramatically increasing during the pandemic. The purpose of this study to explore online grocery shopping behaviors of different generations and their shopping intentions toward online grocery shopping during and after the pandemic. Data were collected from Amazon Mechanical Turk (MTurk) and Southeast region in U.S.A with convenience sample. All Generations know that online grocery shopping is a very useful and pleasure shopping method to purchase foods during the pandemic, but only two Generations (Y and X) plan to keep their online grocery shopping services after the pandemic. Amazon Fresh and Walmart.Com are the popular online applications for online grocery shopping among Generation Z, Y, and X. On the other hand, Baby Boomers believe that grocery shopping through the internet is not easy, and they had a hard time to find grocery items on the website. Generation Z and Baby Boomers prefer to shop their grocery items at the off-line grocery stores after the pandemic.

Keywords: online grocery shopping, consumer behaviors, generations, The Pandemic (COVID-19)

1. Introduction

Given the growth and convenience of the internet in recent years, many consumers now prefer to shop online, instead of brick-and-mortar stores. In 2019, online retail sales in the United States were about $343.15 billion, and they are projected to reach over $476.5 billion in 2024 (Clement, 2020). It is estimated that over 300 million Americans will shop via online platforms by 2023, and that nine out of ten Americans (91% U.S. population) will do so with electronic devices, such as cellphones and I-pads (Hall, 2020; Mohsin, 2020).

Online grocery shopping is no exception to online retails and services. Indeed, groceries are different from regular online products; they are (1) time-sensitive products, which are highly perishable, therefore, time is critical, and (2) they are space-sensitive products, meaning consumers want direct inspection of the quality of products through physical interactions, such as touching and smelling (Upton, 2020). These barriers were prominent in effect prior to the Coronavirus 19 (COVID-19) pandemic: online grocery sales made up a small portion (less than 2% in the United States) of the online sale categories, and 81% of U.S. consumers never had an experience with online grocery shopping.

However, after the WHO declared the COVID-19 pandemic on March 11, 2020, U. S. consumers began looking for a safer mean of grocery shopping to maintain social distancing protocol. As a result of the pandemic, online grocery sales increased dramatically. For example, in the first half of 2020 more than half (52%) of U.S. consumers bought food items online, that number is projected to be around 62.5% by 2021 (Redman, 2020; Upton, 2020). The online grocery market is projected to reach 13.6 % of the total U.S. online market share, and online grocery sales are expected to reach more than $200 billion in 2027 in the U.S. (Redman, 2023, Ozbun, 2022). Hence, even though online grocery shopping still has numerous barriers to entry, it has been suggested that the recent high-technological advancements provide solutions to overcome those space and time barriers mentioned earlier. Even more, as the COVID-19 pandemic is claimed to gradually decrease in severity by the WHO, the convenience, innovative and variety of products that online shopping provides allows many consumers to use this online platform.

As online grocers have been steadily growing finding new innovative ways to buy food, major market players such as Amazon and Wal-Mart are showing greater interest in the online grocery business and are ready to invest (Daniels, 2017; Redman, 2020). In fact, major grocery retailers, such as Wal-Mart, Albertson, Kroger, in addition to online business stores, such as Amazon (Fresh Service), were actively providing their online grocery services during the COVID-19 pandemic. Additionally, online grocery transport service platforms such as Instacart and Cornershop have accelerated the growth of online grocery shopping; these specific services deliver online grocery orders to customer' homes within the agreed time window of one or two hours (Conway, 2020). Online grocery shopping has shown promising results during this COVID-19 pandemic and could cause grocery shopping behaviors to change in the future.

Despite the potential consumer benefits offered by online grocery shopping, such as convenience and time-savings, very limited studies have been done on the consumers' perceptions of online grocery shopping and their expectations for it. Currently, research on consumer online grocery shopping behaviors in the United States lags behind research to other countries such as, Asia, Europe, Middle East, Africa, and United Kingdom, and Czech Republic (Bartók, Kozák, & Bauerová, 2021). Therefore, the purposes of this research are to explore the emerging trends in the online grocery shopping and to investigate the specific online grocery shopping behaviors of different generation in Southern United States. This study identifies the future intention of online grocery shopping after the pandemic.

2. Literature Review

2.1 Online Grocery Shopping

Online grocery shopping started in the 1990's with high-tech generation, who began shopping online for convenience. It is the quickest growing market in present time (Online grocery clicks in the UK, 2017). The important merits of online grocery shopping are convenience and a minimal amount of effort for shopping (Connected commerce report, 2017).

Even though about 9 percent of online shoppers in North America respond that they usually purchase fresh groceries through internet, there are many promising signs that good conditions for online grocery shopping are being created with more chances for online shoppers to easily access to online grocery markets. In fact, many grocery stores in USA such as Walmart start to offer fresh online grocery products through their web sites (Chu, *et al*., 2010; Walmart Media Relations, 2015). These grocery stores promise to guarantee the quality of the freshness of fruits, vegetables, meat and dairy (Connected commerce report, 2017). In March 2017, Amazon, the largest online retailer, starts the online grocery service, named AmazonFresh, to deliver on the same day or next day in some US area. The AmazonFresh joins with Whole Food Market groceries for natural and organic items (Top 11 sites for online grocery shopping, 2017). Such online grocery businesses have been rapidly growing with recent developments in information technology, resulting to one of the representative future grocery market formats.

On March 11, 2020, the World Health Organization (WHO) declared the Coronavirus 19 (COVID-19) pandemic. This global crisis has had a profound impact on both society and the economy. Prior to the pandemic, online grocery sales accounted for less than 2% of total online sales in the United States, with 81% of U.S. consumers having never tried online grocery shopping. However, the necessity of social distancing during the pandemic prompted consumers to seek safer alternatives for their grocery shopping needs, resulting in a significant surge in online grocery sales. By 2021, approximately 60% of U.S. consumers had adopted online grocery shopping, nearly doubling the pre-pandemic figures (Redman, 2021; Upton, 2020). Notably, two out of three online shoppers intend to continue their online grocery shopping habits after the pandemic (Redman, 2021). The COVID-19 pandemic has reshaped grocery shopping habits, fostering innovation in food procurement. Online grocery shopping has shown promising results during this pandemic and is poised to influence future grocery shopping behaviors.

2.2 Online Grocery-Shopping Behaviors based on Generation

Previous research (Eger, *et al*., 2021; Bezirgani & Lachapelle, 2021; Lissitsa & Kol, 2016; Seo, 2016; Seo 2022) indicates that shopping behaviors vary across generation due to differences in their formative years. Factors such as peer influence, social groups, technological advances, advertising, and economic conditions influence the shopping behaviors and purchasing decisions of each generation. For example, the Baby Boomer, born between 1946 and 1964, are prefer to shop near their home and the traditional stores (Bezirgani, & Lachapelle, 2018; Cui, Loo, & Lin, 2017). As a result, Boomers visit traditional grocery stores more frequently than online grocery stores to purchase their food (Bezirgani & Lachapelle, 2018). The Generation X, born from 1965 to 1980, grew up with computers and mobile phones, making them proficient in using technology (Lissitas & Kol, 2016). They also appreciate the convenience of online shopping and are shifting from traditional grocery shopping to online grocery

shopping due to the benefits such as time savings, product variety, and added convenience (Berg & Henriksson, 2020). Generation Y, born between 1981 and 1996, came of age during the internet and digital revolution. They are adept at using technology and frequently shop online. This adaptability to innovative shopping methods has led many retailers to focus on this demographic (Lissitas & Kol, 2016; Seo, 2016). Research indicates that Generation Y popularly engages in online grocery shopping, demonstrating significant purchasing power (Ligaraba, et. al., 2023; Jara, et. al., 2018). Generation Z, born between 1997 and 2012, represents the most recent generation with significant economic influence. Growing up in the digital age, Generation Z is deeply connected to the internet and high technology (Ligaraba et al., 2023). They prefer online shopping and communicate, but there is a dearth of research on the online grocery shopping behaviors of Generation Z.

Several previous studies indicated that each generation exhibits distinct characteristics in online grocery shopping. However, there is a noticeable gap in research regarding the prospective changes in online grocery shopping behaviors during and after the pandemic. Thus, this study focuses on identifying the online grocery shopping behaviors of different generations.

3. Research Method

3.1 Research Hypotheses

To comprehend consumer behaviors in online grocery shopping, this study proposes the following hypotheses to elucidate their intention to engage in online grocery shopping. Hypotheses are proposed as follows:

H 1: There is a significant dependence between generations (Generation X, Y, Z, and Baby Boomers) and online grocery shopping application.

H 2. There is a significant difference between generations and online grocery shopping orientation.

H 3. There is a significant relationship between generations and future intentions of online grocery shopping after the pandemic.

3.2 Data Collection and Questionnaire Development

This study focuses on a sample of U.S. residents aged 18 and older. The questionnaire was administered during the COVID-19 pandemic using a convenience sampling method through both in-person and online surveys conducted via Amazon's Mechanical Turk (MTurk), a widely used crowdsourcing platform for research collaboration (Cummings & Sibona, 2017). The survey link was distributed to participants in the United States by Amazon Web Services. The questionnaire took approximately 15-20 minutes to complete. In-person survey participants volunteered, while online survey participants were compensated for their responses through MTurk. All participants were informed about the study's purpose. Following the exclusion of incomplete and invalid responses, this study obtained a total of 130 valid responses, evenly split between in-person (n=65) and online survey (n=65) for analysis.

The questionnaire is composed of 5 sections: (1) 4 items for grocery shopping, (2) 2 items for online grocery shopping, (3) 2 items for opinion about online grocery shopping, (4) 14 items for online grocery shopping behaviors, (5) 1 item for lists of online grocery food items, and (6) 6 items for demographics. After a pilot test with 50 participants, the investigators finalize the questionnaire for this research project.

In order to comprehend grocery shopping behaviors, the researcher created four questions for grocery shopping patterns. Two questions, adapted from Bezirgani and Lachapelle (2021), measured participants' opinions on online grocery shopping using a 7-point Likert-type scale (1 = "extremely stressful or useless" to 7 = "extremely reassuring or useful"). Two additional questions were created by the researcher to gauge participants' future intentions for online grocery shopping, using a 7-point Likert-type scale (7 = "very likely" to 1 = "very unlikely").

To evaluate online grocery shopping behaviors, 14 Likert-type statements were employed, some adapted from previous study (Bezirgani & Lachapelle, 2021), using a 7-point Likert-type scale ranging from strongly disagree (1 = lowest score) to strongly agree (7 = highest score). The researcher made adjustments to align some statements with the focus of the online grocery shopping study and developed some new statements.

3.3 Description of Sample

This study employed a quantitative method, with 62.3% (n=81) of the respondents being women. Consistent with previous research demonstrating that women typically serve as the primary grocery shoppers in households (Zatz, *et al.*, 2021, Frank & Peschel, 2020; Blanck, et al., 2011). Additionally, all participants reported engaging in grocery shopping at least once a month, with 53.1% (n=69) doing so on a weekly basis. The participants, ranging in age from were aged between 19 and 71 years, had a mean age of 35.2 years. The sample comprised 32 participants from Generation Z, 65 participants from Generation Y, 27 participants from Generation X, and 6

participants from Baby Boomer. The predominant ethnic group was White/ Caucasian (50.8%, *n*=66), and the most common household size in this sample was four (33.1%, *n*=43). The distribution of responses is presented in Table 1. The majority of participants (73.8%, *n*=96) reported shopping online for their grocery items. Nonetheless, 34 participants (26.2%) refrained from engaging in online shopping over the past 6 months (see Table 2). Price (30 %, *n*=39) was identified as the most critical factor when buying groceries online, followed by freshness, which was highlighted by 27.7 % (*n*=36) (see Table 3).

3.4 Data Analysis

For the statistical evaluation, various methods were employed, including frequency analysis, factor analysis, multiple analysis of variance (MANOVA), univariate analysis of variance (ANOVA), and the Chi-square test to analyze the data. Principal component factor analysis with Varimax rotation was employed to examine 14 statements related to online grocery shopping behaviors. Items with factor loadings less than 0.50 were excluded, while those with factor loadings greater than 0.50 were retained in a factor. Consequently, two statements were eliminated due to lower factor loadings.

Table1. Statistics of the sample

	Frequency	Percent
Gender		
Male	49	37.7
Female	81	62.3
Generation Groups		
Generation Z	32	24.6
Generation Y	65	50.0
Generation X	27	20.8
Baby Boomer	6	4.6
ethnic group		
ethnic group		
Race/ Ethnic Group		
White/ Caucasian	66	50.8
African American	50	38.5
American Indian/ Aleut	8	6.2
Asian/ Pacific Islander	4	3.1
Hispanic Origin	1	0.8
Other	1	0.8
Household		
Only One	14	10.8
Two	36	27.7
Three	26	20.0
Four	43	33.1
Five	10	7.7
More than six	1	0.8
Shop for food		
Every Day	17	13.1
Once a week	69	53.1
Once a month	24	18.5
Every two weeks	10	7.7
Occasion	10	7.7
Total	130	100%

Table 2. Number of Generation: Online Grocery Shopping Experience within Last 6 Months

	Generation Z	Generation Y	Generation X	Baby Boomer
Yes	16	61	16	3
No	16	4	11	3
Total	32	65	27	6

Table 3. The Important Factor when buying groceries online

	Frequency	Percent
Factors		
Price	39	30.0
Delivery time	17	13.1
Convenience	29	22.3
Customer service	6	4.6
Freshness	36	27.7
Other	3	2.3
Total	130	100%

4. Results

4.1 Hypothesis Testing

Testing Hypothesis 1

A *chi*-square analysis was conducted to determine the online application (service) used for grocery shopping. The test was independently performed in each Generation group, resulting to $\chi^2 = 44.52$, $p < 0.001$. This reveals that there is a statistically significant difference among the generations and the online service applications used for grocery shopping. From the questionnaire results, Generation X, Y, and Z use several kinds of online grocery shopping application, but Baby Boomer uses only one online application, which is Amazon Fresh, for their food shopping. Therefore, Hypothesis 1 was supported. The results of *Chi*-square analysis (χ^2) are shown in Table 4.

Table 4. The results of a Chi-square analysis (χ^2) for online application (service)

Generation		Online Service (Application) for Grocery Shopping				
		Amazon Fresh	Walmart. com	Instacart	Hello Fresh	Other
Gen Z	Count	**5**	**7**	3	1	0
	Expect Count	**13.8**	**5.4**	2.5	1.5	.5
Gen Y	Count	**41**	11	5	**4**	0
	Expect Count	**28.0**	11.0	5.0	**3.0**	1.0
Gen X	Count	**7**	4	2	1	**2**
	Expect Count	**11.6**	4.6	2.1	1.2	**0.4**
Boomer	Count	3	**0**	0	0	0
	Expect Count	2.6	**1.0**	0.5	0.3	.01
Total (*n*=96)	Count	56	22	10	6	2
	Expect Count	56.0	22.0	10.0	6.0	2.0
	% within Gen.	43.1%	16.9%	7.7%	4.6%	1.5%

Note. Other Application: Target.com, Kroger, & Albertson.

Testing Hypothesis 2

In order to analyze the online grocery shopping behaviors, principal component factor analysis with Varimax rotation was performed and extracted the three factors: Intent to Buy Food Online, Online Shopping Merits, and Shopping Abilities. The cumulative percentage of variance accounted for by these three factors is 76.93% (see Table 5). Reliability (Cronbach's alpha) of each factor ranged from 0.641 to 0.942.

MANOVA and ANOVA are performed to test significant differences among the four Generations. The results of MANOVA indicate that three factors in online grocery shopping orientation are significantly influenced by four generations ($F = 3.43$, $p < .001$). Individual ANOVA reveals significant differences among generation groups on two factors: Intent to Buy Food Online ($F = 5.39$, $p < .005$) and Shopping Abilities ($F = 3.13$, $p < .05$). However, there is no significant difference on one factor, Online Shopping Merits ($F = 1.87$, p = .139). Baby Boomer group has significantly lower mean scores in both Intent to Buy Food Online (M =3.48) and Shopping Abilities (M =4.58) compared to the other three Generation groups. Generation Y has the highest mean score in Intent to Buy Food Online (M =4.95), and Generation X has the highest mean score in Shopping Abilities (M =6.13). Therefore, the results of MANOVA and ANOVA, as shown in table 6, support Hypothesis 2.

Table 5. Principal component analysis of online grocery shopping behaviors

Factor Name	Items	Factor Loading	Eigen-values	Percentage of Variance	Alpha Coefficient
Factor 1 Intent to Buy Food Online	I intend to continue to visit the online grocery retailer's site in the future.	0.931	5.782	52.559	0.942
	I intend to purchase from the online grocery site in the future.	0.903			
	I intend to continue doing business with the online grocery retailer over next few years.	0.895			
	I have a favorable attitude toward continue to do business with the online grocery retailer over the next few years.	0.863			
	In the future, the online grocery is one of the first places I intend to look when I need the food items.	0.811			
	The most important people in my life think I should buy a portion or all of my groceries online.	0.722			
	The most important people in my life recommend that I use online grocery shopping.	0.718			
Factor 2 Online Shopping Merits	Online grocery shopping is useful for more variety and buying products of good quality.	0.830	1.582	14.385	0.641
	Online grocery shopping is safer since it prevents the risk of failing and getting injured.	0.772			
Factor 3 Shopping Abilities	The decision to buy groceries online depends entirely on me.	0.880	1.099	9.987	0.716
	I have all of the necessary resources and abilities to shop online for food.	0.796			
Cumulative percentage				76.93%	

Table 6. The results of MONOVA and ANOVA between Online Grocery Shopping Orientation and Generation

	Group Means				Univariate F	Multivariate F
	Gen. Z (n=32)	Gen. Y (n=65)	Gen. X (n=27)	Boomer (n=6)		
Online Grocery Shopping Orientations						
Intent to Buy Food Online	**3.89**	**4.95**	**3.97**	**3.48**	**6.04****	**3.43*****
Online Shopping Merits	4.64	4.92	4.76	3.67	1.87	
Shopping Abilities	**5.64**	**5.43**	**6.13**	**4.58**	**3.13****	

Note. Means with the superscript indicate significant differences between the Generations.

Scores. ranged from 1 (Strongly Disagree) to 7 (Strongly Agree). ***$p \leq 0.001$, **$p \leq 0.05$.

Testing Hypothesis 3

MANOVA and ANOVA are directly executed to determine how the Generation groups significantly influence on Future Online Grocery Behavior. There are statistically differences among the four generations as shown in Table

7. According to Wilkes Lambda for the MANOVA, two variables (F= 2.35, $p < .05$) are significantly different in Future Online Grocery Behavior. ANOVA indicates that two variables, In the Next 6 Month (F = 2.68, $p \leq .05$) and Online Grocery Shopping after Pandemic (F = 2.25 $p < .1$). Generation Z has the lowest mean score in In the Next 6 Month (M =3.38), and Baby Boomer has the lowest mean score in Online Grocery Shopping after Pandemic (M =3.67). Generation Y has the highest scores in two variables: In the Next 6 Month (M =4.65) and Online Grocery Shopping after Pandemic (M =4.83).

Table 7. The results of MONOVA and ANOVA Analysis of Intention on the Future Online Grocery Shopping Behavior

	Group Means					
	Gen. Z (n=32)	Gen. Y (n=65)	Gen. X (n=27)	Boomer (n=6)	Univariate F	Multivariate F
Future Online Grocery Behavior						
In the Next 6 month	**3.38**	**4.65**	**4.44**	**4.17**	**2.68****	**2.35****
Online Grocery Shopping after Pandemic	**3.81**	**4.83**	**4.22**	**3.67**	**2.25***	

Note. Means with the superscript indicate significant differences between the Generations.

Scores. ranged from 1 (Very Unlikely) to 7 (Very Likely). *$p \leq 0.05$, **$p \leq 0.1$.

4.2 Online Grocery Shopping Items

This study investigated participants' online food purchases over the last six months (see Figure 1). Each participant clearly outlined their shopping lists in the questionnaire. The findings indicated that each generation exhibited distinct preferences in grocery shopping items. While most generations purchased a variety of food items online, the Baby Boomer group exclusively bought canned goods and daily products through online platforms.

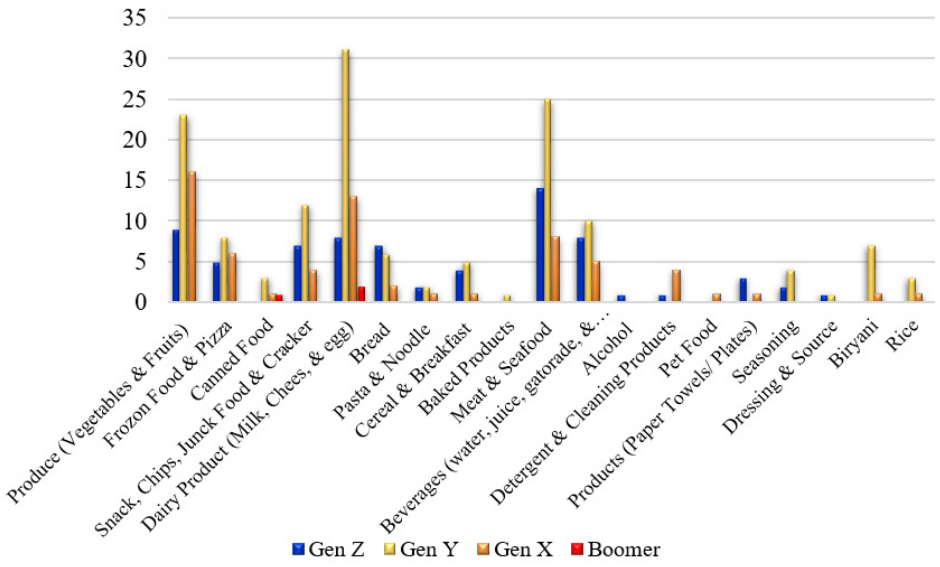

Figure 1. The Lists of Purchased Food Items from Online Grocery Shopping

5. Discussion

The Coronavirus 19 (COVID-19) pandemic has significantly impacted consumers' social contacts, schooling, working, shopping habits, and lifestyles. To adhere to social distancing protocols during the pandemic, many consumers shifted to online shopping, accelerating the trend of online grocery shopping in the U.S.A. (Conway, 2020; Eger, et al, 2021). This study investigated the online grocery shopping behaviors of four generation at in the U.S.A during the pandemic, revealing distinct shopping behaviors among each generation.

The noteworthy findings from this study indicate that online grocery shopping is perceived as a novel and essential

method for purchasing food items across all generations during the pandemic. There is a prevailing inclination among participants from various age groups to continue their online grocery shopping habits through the end of this year. Despite this, a significant majority across the four generations express a preference for traditional grocery stores (brick-and-mortar stores) post-pandemic. It appears that the desire to physically interact with products, assessing attributes such as touch, smell, and freshness, plays a crucial role in consumers' purchasing decisions. Additionally, socialization factors contribute to the trend of many shoppers reverting to traditional grocery stores.

5.1 Generation Z (1997-2012: 11-26 years old)

Generation Z, comprising the youngest and second-largest demographic within this study (24.6%, *n*=32), engages in online shopping as one of their recreational activities. This generation dedicates a significant amount of time online for shopping, social communication, and other pursuits (Roberts, 2023; Seo, 2022; Seo, 2016). Due to their familiarity with electronic devices, including computers, cellphones, and iPads, online grocery shopping does not pose a significant stressor for them. Generation Z exhibits a penchant for purchasing cooking ingredients, such as vegetables, fruits, dairy products, cereals, dressings, meat, seafood, and seasonings, through online platforms like Amazon Fresh and Walmart.com (Figure 1 and Table 4). These platforms are particularly popular among this demographic, reflecting the prevalent online application choices for Generation Z.

While Generation Z demonstrates a comprehensive understanding of the merits (*M*= 4.64) and shopping abilities (*M*= 5.64) associated with Online Grocery Shopping Orientations, online grocery retailers are not their primary choice for food procurement. This is evident from the relatively low mean score of 3.89 (Table 6), which falls below the median score of 4 in 7-point Likert-type scales. Furthermore, the findings suggest a preference among Generation Z to revert to traditional retail grocery stores for their food purchases, both in the short term and post-pandemic. The mean scores for ‘In the Next 6 Months’ (*M*= 3.39) and ‘Online Grocery Shopping after Pandemic’ (*M*= 3.81) fall below the median score of 4 in 7-point Likert-type scales (Table 7). To capture the potential future market of online grocery customers within this demographic, it is imperative for online grocery retailers to diversify their services and enhance marketing strategies. This may include offerings such as free delivery, reduced shipping and handling fees, flexible time slots, and more.

5.2 Generation Y (1981 ~ 1996: 27-42 years old)

The Generation Y cohort, often referred to as the Internet generation, exhibits a strong preference for online shopping (Lissitsa & Kol, 2016). Representing the largest demographic within this study at 50.0% (*n*=65) within this study, Generation Y notably favor the use of the Amazon Fresh online application for their grocery needs, as outlined in Table 4. Their online purchases frequently include a diverse array of ingredients for cooking and baking, along with dairy products, as illustrated in Figure 1.

Notably, Generation Y demonstrates a profound understanding of the merits (*M*= 4.92) and shopping abilities (*M*= 5.43) associated with online shopping. This understanding is reflected in their highest mean score for the 'Intent to Buy Food Online' (*M*= 4.95, Table 6). Furthermore, they express a greater likelihood to sustain their online grocery shopping behaviors compared to other generations, including Z, X, and Baby Boomers. The mean scores for ‘In the Next 6 Months’ (*M*= 4.65) and ‘Online Grocery Shopping after Pandemic’ (*M*= 4.83, Table 7) are the highest across the four generations.

This propensity towards online grocery shopping among Generation Y may be attributed to their busy schedules, making traditional grocery store visits challenging, coupled with a sufficient disposable income to facilitate online purchases. Consequently, Generation Y is positioned to assume a pivotal role as the primary demographic propelling the trajectory of online grocery shopping in the near future, establishing themselves as the predominant online grocery shoppers within the market area.

5.3 Generation X (1965 ~ 1980: 43-58 years old)

Comprising 20.8 % of the study's population (*n*=27), Generation X emerges as the third-largest demographic. Notably, this generation adopted internet usage, computers, and mobile phones later in life compared to Generations Z and Y (Lissitsa & Kol, 2016). Despite this, Generation X actively utilizes various online shopping applications for their food items, as detailed in Table 4. Their online purchases encompass a diverse range of cooking ingredients and household items, as illustrated in Figure 1. Acknowledging the benefits of online grocery shopping during the pandemic, Generation X attributes favorable Online Shopping Merits (*M*= 4.76) and impressive Shopping Abilities (*M*= 6.13, Table 6) to this mode of purchasing. They perceive online grocery stores as offering enhanced opportunities for acquiring a variety of products compared to traditional grocery stores. However, their Intent to Buy Food Online (*M*= 3.97) falls below the median score of 4 in 7-point Likert-type scales (Table 6).

This study anticipates that, under circumstances necessitating flexibility, Generation X will likely utilize both online and traditional grocery stores from the present to post-pandemic. The mean scores for 'In the Next 6 Months' (M= 4.44) and 'Online Grocery Shopping after Pandemic' (M= 4.22) marginally exceed the median score of 4 in 7-point Likert-type scales (Table 7). Generation X exhibits a preference for checking the quality of foods before making a purchase decision, a practice that aligns with their desire for a tactile and sensory experience. Additionally, their inclination towards traditional grocery stores may stem from the desire for social or personal interactions in the shopping environment.

5.4 Baby Boomer (1946 ~ 1964: 59-77 years old)

The Baby Boomer group, constituting the smallest demographic in this study at 4.6% (n=6), stands out as a generation not accustomed to a digital environment (Williams & Page, 2011). Consequently, their preference leans heavily towards traditional grocery stores (Eger *et al.*, 2021). Remarkably, Baby Boomers exclusively engage with online grocery shopping through a single application, namely Amazon Fresh, focusing primarily on canned foods and daily products, as depicted in Figure 1 and Table 4.

An intriguing observation emerges as Baby Boomers recognize the substantial Shopping Abilities (M= 4.58, Table 6) offered by online grocery shopping, acknowledging its potential as a valuable resource for procuring food items. However, the mean score for Online Shopping Merits (M= 3.67) falls below the median score of 4 on the 7-point Likert-type scales (Table 6). Evidently, it appears that Baby Boomers prioritize assessing the freshness, smell, and quality of food items before making a purchase decision.

The potential challenges linked to using electronic devices and navigating online platforms may contribute to Baby Boomers perceiving online grocery shopping as a stressful activity. This sentiment is reflected in their lowest mean scores for Intent to Buy Food Online (M= 3.48). Although they express an inclination to continue online grocery shopping in the next six months (M= 4.17), the intention to return to traditional grocery stores after the pandemic is evident. The mean score for Online Grocery Shopping after the Pandemic (M= 3.67, Table 7) is the lowest among the four generations, aligning with findings from previous research (Williams & Page, 2011; Driediger & Bhatiasevi, 2019; Eger *et al.,* 2021). The findings of this study confirm that Baby Boomers prefer a tactile engagement when selecting grocery items, relying significantly on their senses of sight, touch, and smell. Moreover, it appears that they place value on social interactions at traditional grocery stores.

6. Conclusion

Grocery shopping is a fundamental aspect of human life, and many women take on the role of primary shoppers. In this study, it is observed that a significant number of consumers are accustomed to purchasing their groceries on a weekly basis. While online grocery shopping had limited popularity before the COVID-19 pandemic, it has since experienced a substantial surge, driven by the imperative for social distancing. Consequently, consumers have shifted from conventional traditional stores (brick-and-mortar stores) to online platforms during the pandemic. This change is attributed to the growing awareness of the conveniences and time-saving benefits associated with online grocery shopping. During the pandemic, consumers are turning to online platforms to purchase a diverse range of foods for cooking and baking. Price is a crucial factor influencing the decision to shop online. Notably, Amazon Fresh and Walmart.com emerge as popular choices for online grocery shopping in this study. For those familiar with electronic devices, this preference for online shopping may persist even after the pandemic.

7. Implications

To retain and attract both current and prospective online grocery shoppers, retailers and marketers must thoroughly understand the prevailing shopping behaviors of consumers and the factors driving any changes. This study offers insights into the online applications preferred by customers and their future intentions to engage in online grocery shopping. To appeal to all generations, retailers and marketers should transparently communicate the quality of fresh produce and daily products on their websites and mobile applications. Developing user-friendly online grocery applications may encourage older generations, such as Baby Boomers, to increasingly adopt online grocery shopping. Price sensitivity is a common trait among most generations when considering products and delivery services on online grocery stores. Retailers and marketers should carefully weigh these factors when shaping their marketing strategies. Therefore, the findings of this study can significantly contribute to the development of effective online grocery marketing strategies for retailers and marketers.

8. Limitation and Future Study

Several limitations of this study should be acknowledged. Firstly, the sample was derived through a convenience sampling method, employing a relatively small size and confined to the Southeast region of the U.S.A for the in-person survey. Hence, the generalizability of the study's findings to the entire U.S.A. online grocery shopper

population may be limited, and variations in results could arise when comparing the data across broader demographic segments. Secondly, while numerous online grocery shopping applications exist, this study focused on six specific platforms. Future research should encompass a broader range of applications. Additionally, further investigations should consider additional variables such as income levels, delivery conditions, and the number of family members, as these factors are likely to have a significant impact on online grocery shopping behaviors. Finally, upcoming studies should incorporate cross-national comparisons, considering gender and various age groups for a more comprehensive analysis.

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Obtained.

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The Publication Ethics Committee of the Canadian Center of Science and Education.

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Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

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