Original Paper

Grocery Shopping Channels: Segmentation by Gender and Age Group

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Abstract

Grocery shopping via online and multi-channel (using both physical stores and online) has been increasing. Although physical stores still serve a dominant format for grocery shopping, the research examining consumption patterns across grocery channels fails to show this wave of increasing online or multi-channel grocery shopping. Using a secondary data set of 7212 grocery shoppers, we used corresponding analysis to identify grocery shopper segments based on gender and age group that were associated with specific channels (physical store, online, and multi-channel), and GLM to examine consumption patterns across the segments. We offer both theoretical and practical implications for grocery marketers.

Keywords

grocery shopping channel, segmentation, gender, age group, consumption patterns

1. Introduction

When shopping for groceries, modern-day consumers prefer various methods. They can access a wide selection of groceries and accomplish various goals such as information search, transactions, and delivery through different channels, that is, in-store (offline), online, multi-channel (hybrid using both online and offline channels). Unsurprisingly, shopping in physical stores remains the most popular method for purchasing groceries (Ward, 2019). However, since the introduction of the first online grocery store in the late 1990s, the online grocery market continues to expand rapidly. Online grocery shopping increased 29% annually from 2014 to 2016, and in 2018, the U.S. online grocery market grossed $26 billion, more than doubled from $12 billion in 2016 (Magana, 2019). According to the NPD Group, a leading global information company, 10% of U.S. consumers regularly shop online for groceries ("The NPD Group", 2018). While online grocery shopping still comprises a small portion of the overall supermarket industry, many well-established brick-and-mortar grocery stores such as Walmart and Kroger are working to innovate pickup and delivery options, which entail online operation. Given its prosperity in order and delivery usage in recent years, online and multi-channel grocery shopping is projected to sustain its growth (Magana, 2019).

There is an extensive range of literature comparing online and in-store grocery shopping consumer groups. For instance, some researchers have revealed that age, education, gender, and income are the main demographic variables affecting grocery shopping channel choice (Hiser, Nayga, & Capps, 1999; Sieber, 2000). Other researchers have focused on shoppers' value perceptions such as information and order accessibility (Hansen, 2008), innovativeness (Hansen, 2005), and consumer shopping orientations (Chatterjee, 2010; Morganosky & Cude, 2000, 2002; Verhoef & Langerak, 2001). However, the studies reported above are limited in geographic areas, outdated, and not reflective of present-day grocery consumers. As consumer characteristics and preferences are rapidly changing, there is a critical need to conduct an empirical study on grocery shopper segmentation. Segmentation bases that have been frequently used in retailing, although not limited to grocery retailing, are gender and age group (Atkins, Kumar, & Kim, 2016; Kim, Ha, & Park, 2019; Sullivan & Hyun, 2016). To this end, the current study will examine consumption patterns across grocery shopper segments identified by shopping channel, gender and age groups. These findings will help grocery retailers tailor their offerings to different customer segments.

2. Research Background

2.1 Grocery Shopping Channels

Each grocery shopping channel has unique features. Traditional brick-and-mortar stores allow consumers to tangibly examine and immediately appraise (e.g., feel, touch, and sample) the products, receive personalized attention and recommendation from the sales staff, and experience instant gratification (Grewal, Iyer, & Levy, 2004). In fact, Siu and Chow (2004) revealed that personal interaction is the most important factor for customer satisfaction with a Japanese supermarket in Hong Kong. To provide these heightened tangible experiences, grocery retailers have increasingly emphasized their sensory environment where consumers can enjoy sight, sound, smell, taste, and touch, which has helped them compete against online retailers.

Contrastingly, consumers value online grocery shopping as it substantially reduces the physical efforts associated with traditional in-store grocery shopping, such as travel, product carrying, and time pressure (Roberts, Xu, & Mettos, 2003). Furthermore, online grocery shopping grants consumers greater access to find product information and cross-reference prices to secure the best-purchase price, enable direct multi-attribute comparison, and avoid invasive salespeople (Alba et al., 1997; Ramus & Nielsen, 2005).

Moreover, over the past few decades, more consumers are shopping groceries via multi-channel environments. According to Siawsolit and Gaukler (2019), a vast majority of consumers actively shop for groceries in multi-market channels such as shopping in-store, online, at kiosks, and in farmers' markets, and multi-channel operations such as ordering online and picking up in-store the next day are increasing in popularity. Additionally, many retailers are offering deep-discounts or free shipping as shipping incentives. In these ways, multi-channel shopping is beginning to transition to an omni-channel experience or a fully online experience (Siawsolit & Gaukler, 2019).

Inorder to cater to varied shopping preferences, retailers face a monumental task of offering and managing the interaction of multi-channel shopping methods such as brick and mortar stores, kiosks, and/or web sites (Chatterjee, 2010). Therefore, grocery retailers must understand who their main customers are based on demographic information and consumption patterns to better understand their target customers and develop strategies to meet their needs.

2.2 Grocery Shopper Segmentation by Gender and Age Group

Despite anecdotal evidence finding gender and generational differences an important consideration in grocery channel selection, systematic examination of shopper segmentation in the context of grocery shopping is limited. Recently, Ward (2019) reported that the majority of consumers who shop online are millennials (67%), while older consumers such as baby boomers (41%) and seniors (28%) prefer to shop offline.

Although limited, empirical studies have found the relationship between grocery shopping channel and demographic information. Carpenter and Moore (2006) examined demographic variables and the respective effects on a specialty grocery format and found that an individual's level of income was a significant predictor of shopper patronage as respondents with higher incomes were more likely to shop in specialty grocery stores. In Sieber's (2000) study on Swiss grocery shoppers, online shoppers were male-dominant (66.8%), 20-39 years (74.4%), and married (51.6%). Hiser et al. (1999) conducted an exploratory analysis of familiarity and willingness to use online food shopper services in a local area of Texas. They found males, younger consumers (aged 18-29), and those with at least some college education were more likely to be familiar with and willing to do online food shopping than their counterparts. In a study conducted by Hui and Wan (2009) who collected data from supermarket shoppers and the shoppers who had access to the Internet at home, 21-40-year-olds, the "most economically stable" age group, showed a greater inclination to buy online.

Using an exploratory study, Baig and Khalid (2016) identified preferences toward grocery shopping channels and consumer orientations from grocery shoppers in Karachi, Pakistan. They found that females had a greater tendency to be leisure and social shoppers than males. Also, males had a higher tendency to seek assistance in a retail setting and shop online. While income did not impact shopping channel preferences, as income bracket increased, shoppers were more likely to neglect the best-price seeker typology, likely valuing the quality of the product over price.

As such, the studies reported above validate the importance of segmenting the grocery shopper market based on age and gender but are limited in geographic areas, research time (i.e., not current), and small sample sizes. This study will fill this void by identifying grocery shopper segmentations based on a preferred shopping channel, gender, and age group. Identified segments will be compared and contrasted in their consumption patterns.

2.3 Consumption Patterns of Grocery Shoppers by Channel

The literature reveals that consumption patterns of grocery shoppers differ by grocery channel. Chetthamrongchai and Davies (2000) segmented the traditional market for food shoppers in northern England based on their attitudes towards shopping (enjoyment, regular shopper, eating convenience shopper, shopping as an event, and apathy) and their time orientation (past orientation, present orientation, future orientation, time pressure, and succession). They identified four clusters: Time-pressured convenience seekers, Hedonists, Apathetic but regular, and Convenience seekers. These four clusters revealed significant differences in demographic composition, shopping attitudes, and time orientations. For example, time-pressured convenience seekers tended to be young, employed, educated, and living in a large house. Hedonists tended to be older, be employed, enjoy shopping as a recreation, and score high on present orientations. Atkins et al. (2016) identified three clusters among grocery shoppers who made a smart purchase in their most recent in-store shopping trip: spontaneous shoppers, apathetic shoppers and involved shoppers. Involved smart shoppers were highly involved in pre-purchase and purchase stages such as planning, saving money, time, and effort were mostly found among baby boomers.

As shopping online provides consumers a venue in which they can shop 24/7, online shopping offers quick to compare prices in real-time across a variety of retail outlets, allowing them to save money (Chatterjee, 2010; Ward, 2019). Additionally, e-grocery shoppers were found shop more practically and realistically based on their schedules. According to Chu, Arce-Urriza, Cebollada-Calvo, and Chintagunta (2010), grocery shopping online allows consumers to focus on time-constraints and to make specific product purchases rather than leisure and non-necessity purchases. Similarly, Punj's (2011) study revealed that online shopping helps consumers find the best product fit, that is, finding a product that best matches their need.

While e-grocery shoppers may find that shopping online is more practical and time-efficient, food safety is critical to these consumers as they cannot see, touch, and smell the items before they purchase (Hebrok & Heidenstrøm, 2019). According to Liang's (2014) study with Taiwanese consumers, trends in e-grocery shopping have shifted to buying more organic foods. In addition, he identified three clusters of online organic food consumers: enthusiastic food consumers, uninvolved food consumers, and traditional food consumers. Enthusiastic food consumers had the highest ratings on five food-related lifestyles: health and comfortable dining, love of the fun of cooking, the pursuit of convenience, love of organic food, and importance of product information.

With the push to decrease consumer ecological footprint, consumers can reduce the amount of food waste by ordering smaller portions of food online more frequently, and streamlining the delivery process (e.g., securing an easy method of delivery via auto-delivery) of pre-portioned meals. Additionally, these methods aid the preservation of food quality (Hebrok & Heidenstrøm, 2019). However, shopping online for products may not be as efficient as widespread belief due to high amounts of carbon footprint being used to secure the products (Pearce, 2019). Certainly, food procurement methods such as shopping in physical stores or online can influence the extent to which food safety or food waste can be controlled. Ertza, Francois, and Durif (2017), in their experiment with Canadian consumers, found that consumers perceive better product quality when food packaging shows environmental claims and eco-labeling.

The globalization of the food supply had led to heightened attentiveness regarding a food's origin and safety. Unsurprisingly, concern for food safety is a primary motivation for local food consumption, which has seen an upsurge in sales in recent years (Halweil, 2002; Feldmann & Hamm, 2015). Similarly, in Sneed, Fairhurst, and Whaley's (2019) study on local food purchasing from the farmers' market channel, consumers with high food safety value showed positive attitudes toward local food quality.

In the literature, an integrated investigation of different consumer groups and the corresponding consumption patterns has yet to be undertaken. As consumers are diversified and demand specialized attention from marketers, examining consumption patterns across channels will help grocery retailers to better serve their customers and become more competitive. To this end, this study will (1) identify grocery shopper segments based on preferred channels, gender, and age group, and (2) examine consumption patterns of each segment.

3. Methods

3.1 Sample and Data

The researchers in this study utilized secondary data from Predictive Analytics survey, conducted in December 2017 by the Prosper Foundation in the United States. The data contained 7212 total respondents. In response to the question "In the past 30 days, how have you shopped for groceries?",

5687 consumers used only physical stores, labeled as Physical store shoppers; 360 consumers shopped only online, labeled as Digital shoppers; and 423 consumers used both channels, labeled as Multi-channel shoppers. To secure balanced numbers of shoppers across the channels, we randomly selected 500 physical shoppers. Therefore, the final sample consisted of 1283 grocery shoppers: 500 in-store shoppers, 360 digital shoppers, and 423 multi-channel shoppers. The respondents' gender was distributed almost evenly: males (48.25%) and females (51.75%). The largest number of the respondents were married (48.41%), and white/Caucasian (73.42%). The largest number (19.62%) of them had household income of $50,000-74,999 (21.36%), followed by $75,000-99,999 (13.64%) and $35,000-49,999 (12.78%). Their ages ranged from 18 to 83, with a median age of 41.

3.2 Measures

For the market segmentation purpose that involves running a correspondence analysis, we used three variables: gender, age group, and channel for grocery shopping. The grocery shopping channels were physical store, digital, and multi-channel. We divided the respondents' age-groups into four groups: 20s (18-29), 30s (30-39), 40s (40-49), and 50s+ (50-83). The segments identified by the correspondence analysis were compared in their consumption patterns and the extent to which they made changes in the last six months. The consumption patterns consist of six statements: "I have become more practical and realistic in my purchases", "I have become more conscious about food safety", "I have become more budget conscious", "I am focusing more on buying local and/or from small businesses", "I have become more environmentally responsible", and "I am eating home cooked meals more often". The responses to these statements were rated as binary (1="yes" or 0="no").

4. Analyses and Results

Using SAS 9.4 software, we conducted a correspondence analysis to segment consumer groups based on gender, age group, and grocery shopping channel. Correspondence Analysis (CA) is a multivariate perceptual mapping technique that determines relationships among categorical variables and cases (Hair, Black, Babin, & Anderson, 2009). The mapped variables allow researchers to identify and interpret consumer segments (Greenacre & Hastie, 1987). After identifying grocery shopper segments, General Linear Model (GLM) was used to compare the segments in consumption patterns.

4.1 Correspondence Analysis: Segmentation Based on Gender, Age Group and Channel

We conducted a correspondence analysis which required the creation of a contingency table based on shopping frequency for each channel combined with gender and age group, as illustrated in Table 1. As correspondence analysis examines the association between rows and columns in the contingency table, the researchers checked the chi-square (Weller & Romney, 1990). The total chi-square in the model was 86.794 (*df*=6, *p*=.001), indicating a significant dependency between rows (age groups) and columns (channels). Figure 1 is the perceptual map of the correspondence analysis. The two dimensions accounted for 100 % of the variance (88.41% for the first dimension and 11.59% for the second dimension), indicating that the horizontal spread (first dimension) of the points captures the most essential information.

Table 1. Cross-tabulation of Grocery Shopping Frequency by Age Group and Channel

	Physical Store	Digital	Multi-Channel	Total
2 (18-29)	84	126	84	*294*
3 (30-39)	87	93	120	*300*
4 (40-49)	78	54	75	*207*
5 (50+)	251	87	144	*482*
Total	*500*	*360*	*423*	*1283*
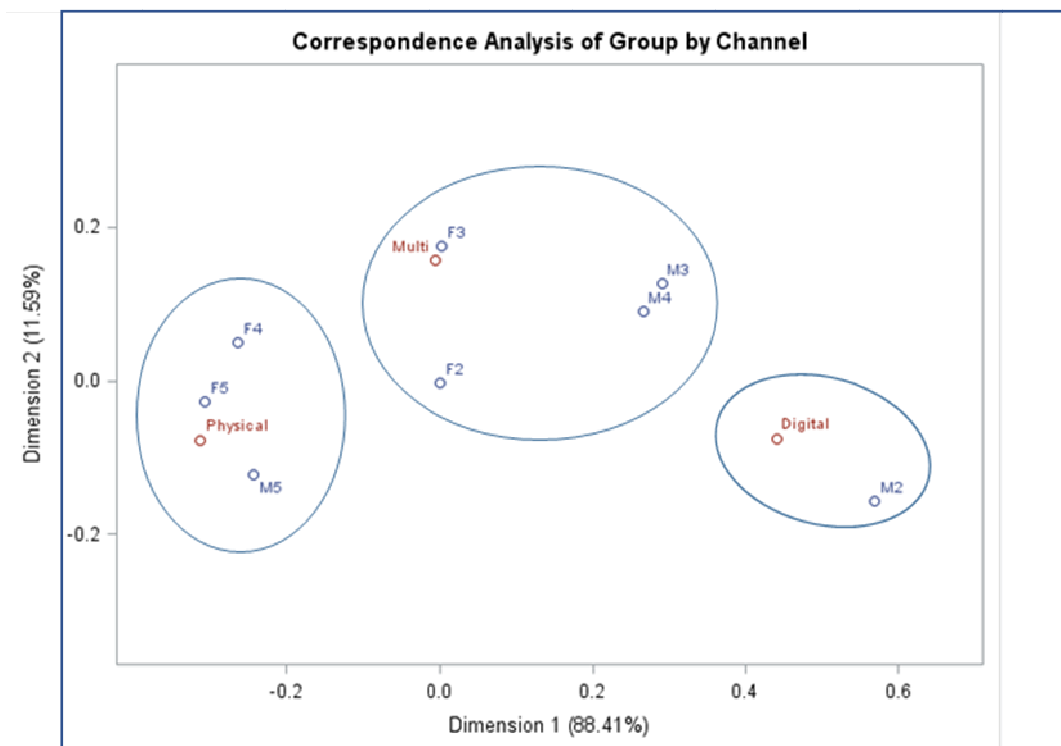
Figure 1. Correspondence Analysis

Note. Retail formats: Physical Store, Digital, and Multi-Channel, Age groups: 2 (18-29), 3 (30-39), 4 (40-49), and 5 (50+).

Correspondence analysis identified segments based on gender and age along with channel type. Figure 1 shows three segments: Physical store shoppers (n=304) who are females in the40s and 50s+, and males in the 50s+; Multi-channel shoppers (n=186) who are females in the 20s and 30s and males in the 30s and 40s; and Digital shoppers (n=90) who are males in the 20s. To further confirm the structure of the three segments, we conducted a cluster analysis with a dendrogram. This cluster analysis used Ward's method, and the data set was raw and column coordinates of two dimensions from the correspondence analysis. Figure 2 depicts the cluster analysis resulting in three segments that are in line with those in Figure 1.
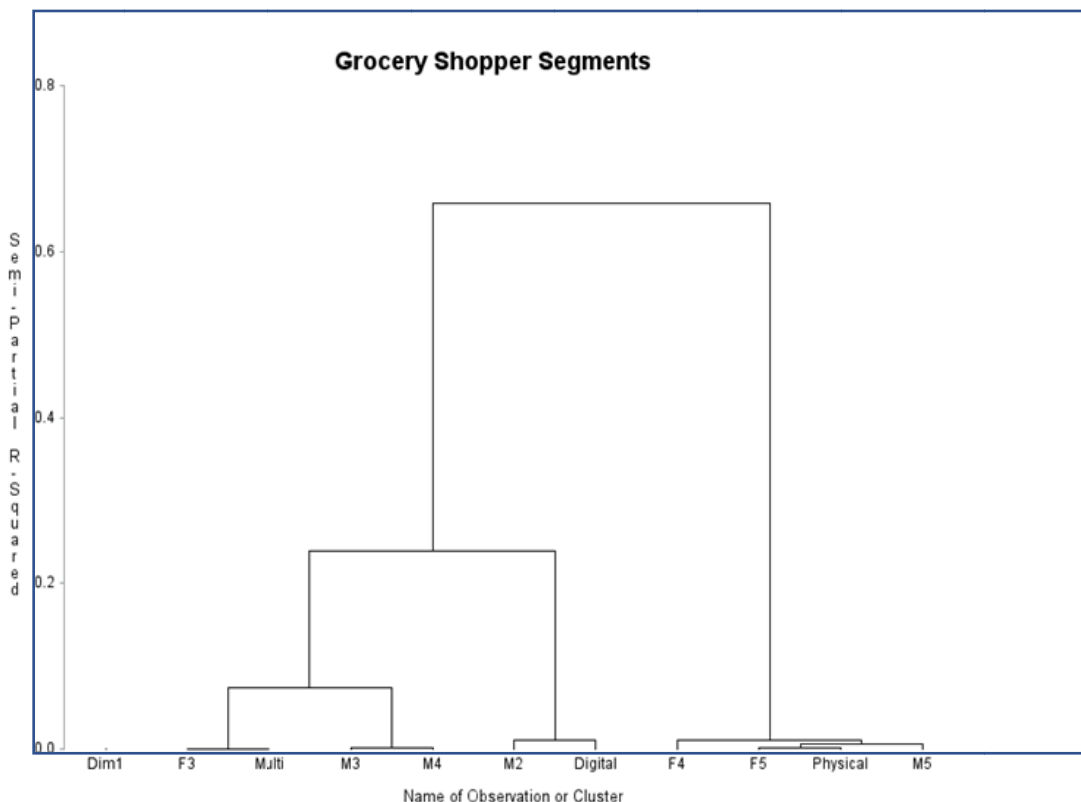
Figure 2. Cluster Analysis

Although correspondence analysis and cluster analysis identified three segments, it should be noted that each segment was not exclusive to the other segment. For example, while male consumers in their 40s were grouped distinctly into Multi-channel Grocery Shoppers, some of these consumers may also shop only at physical stores because M4 was not far from Physical Store Shopper segment, as can be seen in Figure 1. As a result, the final sample from these three exclusive segments consisted of 580 respondents. For GLM analysis, we used these three segments for providing information for developing unique strategies for each segment.

4.2 GLM: Comparing Segments in Consumption Patterns

The three segments were compared in consumption pattern changes using GLM. As illustrated in Table 2, all six consumption pattern changes were significantly different among the three segments. To identify specific multiple group comparison, the Tukey test was employed to determine where the differences exist. For "becoming more practical and realistic in my purchases", digital shoppers made greater changes than multi-channel shoppers, which in turn made greater changes than physical store shoppers. On the other hand, multi-channel shoppers made the greatest changes in "becoming more conscious about food safety", "becoming more budget conscious", and "focusing more on buying local and from small businesses". For the item of "becoming more environmentally responsible", multi-channel shoppers made the greatest change, while digital shoppers made the least change in this consumption pattern. To the contrary, physical stores shoppers made the greatest changes in "eating home cooked meals more often".

Table 2. Means of Consumption Pattern Changes by Segment

	Physical store shoppers (n=304)	Multi-channel shoppers (n=186)	Digital shoppers (n=90)	F	Group Difference
I have become more practical and realistic in my purchases.	.026	.075	.156	10.70***	D > M > P
I have become more conscious about food safety.	.039	.172	.089	12.91***	M > P, D
I have become more budget conscious.	.168	.339	.122	13.23***	M > P, D
I am focusing more on buying local and/or from small businesses.	.099	.172	.044	5.70**	M > P, D
I have become more environmentally responsible.	.240	.425	.056	24.20***	M > P > D
I am eating home cooked meals more often.	.293	.134	.067	15.96***	P > M, D

Note. 1=yes, 0=no; ** $p<.01$, *** $p<.001$.

5. Discussion and Implications

The primary objective of this research was to conduct a segmentation analysis of US grocery shoppers based on their grocery shopping channel choice, gender, and age group. The researchers utilized demographic variables to identify three consumer clusters that are associated with a specific channel (i.e., physical store shoppers, digital shoppers, and multi-channel shoppers), all of which exhibited distinctive consumption patterns. Retailers can utilize our results to target the specific age and gender groups that show a higher tendency to shop via online, multi-channel, or physical stores and tailor their marketing strategies to different consumer groups.

Overall, as age increased, shoppers preferred physical store over online store or multi-channel. Specifically, digital shoppers were in their 20s, multi-channel shoppers were in their 20s to 40s, and physical store shoppers were in the 40s, 50s, and older ages. These findings are consistent with prior research that younger shoppers are more eager to adopt technology and engage in online shopping (Hui & Wan, 2009). Physical store shoppers were mainly Gen X shoppers (Ages 37-52) who spent the most each month on groceries (Winsight Grocery Business, 2018) or baby boomers (53-71). From this research, the grocery market seems to consist of most lucrative consumer groups. Moreover, while both males and females proportionally use physical and multi-channels, online shopping channel is male-dominant, a finding backed by prior research (Hiser et al., 1999; Lokken et al., 2003). With recent pushes to change gender roles, male shoppers are willing to undertake responsibility for the grocery shopping task in all shopping channels, a traditionally female role (Mortimer, 2012).

The results of this study revealed distinctive consumption patterns among the grocery shopper segments. Firstly, practicality was the most critical value for digital shoppers, followed by multi-channel and physical store shoppers. Researchers have identified that as convenience is their main motivation, online shoppers have a stronger utilitarian purpose (Childers, Carr, Peck, & Carson, 2001; Ward, 2019). To cater to these consumers, online retailers may promote their brand as being ingrained with utilitarian philosophies. Additionally, male shoppers are more likely to read/research product information (Kinley, Conrad, & Brown, 2000), so online retailers must ensure that their websites are easily navigable, allow

shoppers to receive details on product description, feature comparisons to other similar products, and provide customer reviews.

Our findings also illuminate that in comparison to digital and physical store shoppers, multi-channel shoppers tend to be more budget-conscious, possibly due to the method oftentimes being the most economical option. These consumers may consider additional operations to save money (e.g., discounts online or offline). To appeal to multi-channel shoppers, retailers could offer online sale coupons and promotional advertisement at the point-of-purchase. Moreover, multi-channel shoppers are more likely to be conscious about food safety and environmental sustainability, and purchase from local and/or small businesses. Hence, grocery retailers are advised to create multi-channel marketing strategies that highlight values in food safety, locally sourced, and environmental concern both online and offline. By marketing that their brand is involved in green initiatives (e.g., support eco-friendly community initiatives), their products meet high food safety standards, are locally-sourced food at farmer's markets, and have eco-labels (Ertz et al., 2017), grocery retailers can attract more multi-channel consumers.

Lastly, physical shoppers are more likely to enjoy home-cooking than digital and multi-channel shoppers. Unless for socialization, older generations, a majority of physical shoppers in this study, are known to prefer home-cooking to dining out in comparison to younger generations (Ward, 2019; Yamanaka et al., 2003). Physical grocery retailers may carry more meal-kit related products that simplify home-cooking to better appeal to these shoppers. In doing so, they must provide interactive environment so customers can freely ask and obtain information about the products. Furthermore, physical store shoppers are more inclined to hedonic experiences than online shoppers (Kim, Sullivan, & Forney, 2007). Therefore, physical grocery retailers can capitalize on their sensory appeal (i.e., sight, sound, smell, touch, taste), an advantage over online retailers who can appeal only to sight and sound. Considering Atkins et al.'s (2016) finding that baby boomers belonged to involved smart shoppers who were highly involved in planning, saving money and time, and getting the right product, enhancing in-store experience with attractive and well-organized store design seems critical to appeal to this consumer group.

6. Limitations and Future Research

While the results of this study may provide unique implications for marketers of grocery shopping, the study has several limitations. First, the dataset was derived from the secondary data set, which had the fixed set of questions on consumption patterns. Future research can identify a valid pool of consumption patterns that are relevant to the grocery shopping context. With the recent global increase of online grocery shopping, future studies can conduct cross-cultural studies to determine whether similarities or differences exist among countries in segmentation and consumption patterns. Second, this study measured consumption patterns as binary variables (yes and no). Future research could employ a rating scale to increase validity and reliability of the scale. Third, this study employed two demographic variables of age group and gender for the segmentation purpose. Future research also can employ income or education as a segmentation basis. Lastly, although correspondence analysis visualized the three segments based on grocery shopping channel, gender, and age group, it excluded a sizable number of respondents. To avoid this loss of data, future research could combine it with other statistical methods such as network analysis combined with structural equation modeling and link analysis. Nonetheless, we believe that this study will spark interest to further develop the research stream of digital or multi-channel grocery shopping methods in contrast to traditional brick-and-mortar operations.

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