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The effects of online and offline information sources on multiple store patronage

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Abstract

The purpose of this study is to examine the relationship between multiple store patronage (MSP) and information source usage both online and offline. In particular, this study investigates the detailed effects of information sources on MSP rather than considering whether consumers choose online or offline sources. In prior studies, MSP has been conceptualized using the consumer cost-benefit framework and relates to consumer multiple store usage. However, even though prior studies have emphasized the importance of information sources in the cost-benefit framework, those that consider MSP have not tested the sources' effects. This current study conducts empirical count data analysis in the Japanese sports shoes retail market. The results reveal that consumers evaluate information sources using more detailed divisions than simply online and offline. This study contributes to studies on MSP because it is the first to identify the impact of information source usage on MSP.

Keywords

Information source; online; offline; multiple store patronage.

1. Introduction

Consumer retail patronage behavior has attracted research attention for several decades (e.g., Arnold, Oum, & Tigert, 1983; Ganesh, Reynolds, Luckett, & Pomirleanu, 2010; Monroe & Guiltinan, 1975). Although earlier studies focused on determinants of retail patronage (Dodds, Monroe, & Grewal, 1991; Tellis & Gaeth, 1990), recent studies have focused more on patronage patterns, in particular, multiple patronage behavior (e.g., Baltas, Argouslidis, & Skarmeas, 2010).

Prior studies postulated that patronage is loyalty toward a single store. However, retail patronage behavior is considered more complex from the perspectives of consumer utility maximization (e.g., Baltas et al., 2010), the plurality of loyalty (e.g., Uncles, Ehrenberg, & Hammond 1995), and the retail market structure (e.g., Luceri &

Latusi, 2012). Store choice behavior was traditionally regarded as consumer utility maximization behavior (Pan & Zinkhan, 2006). However, such utility maximization is not limited to patronizing a single store: Consumers allocate their selections to several stores in order to maximize utility when shopping. Further, there are arguments about consumers' polygamous loyalty (Dowling & Uncles, 1997). For example, researchers have recently developed a greater interest in market structure, which influences consumer choice patterns among alternatives (Luceri & Latusi, 2012; Maruyama & Wu, 2014).

Consumer retail patronage results from the relationship between consumer shopping behavior and the retailers' approach. Consumer shopping behavior among stores involves consumer information search behavior regarding products and retail characteristics. Since Copeland (1923) conceptualized product categories based on consumer buying habits, information seeking has been highly related to shopping among stores. When consumers patronize multiple stores, they are expected to acquire information about each store in terms of both product and retail-related information in order to maximize utility. Thus, it is anticipated that information search behavior relates to multiple store patronage patterns.

Further, the advent of e-commerce (EC) is expected to influence consumer information searches and shopping behavior in terms of the cost reduction of information seeking and visiting stores (e.g., Bakos 2001; Neslin et al., 2006). However, little is known about the relationship between consumer information usage and store patronage.

Information source refers to the source from which consumers obtain information about products. The importance of this has been emphasized in information search behavior studies (Ratchford, 1982). Early studies on information searches through the Internet emphasized that online and offline searches are considered substitutes (Ratchford, Lee, & Talukdar, 2003) because Internet usage reduces consumer information-searching cost (Bakos, 2001). However, a recent study showed that consumers use online and offline information sources as complements (Singh, Ratchford, & Prasad, 2014). Thus, the means of using different information sources should influence multiple store patronage patterns.

This study aims to examine the effects of consumer information usage on multiple store patronage. In particular, the research focuses on information sources in both online

and offline contexts. Consumers who use EC are expected to use fewer stores in order to reduce shopping costs. However, if they tend to use various kinds of information related to products, they may willingly visit stores in order to seek information. Thus, the way of using information sources relates to the patronage set size of stores.

Considering market structure as an influencing factor on multiple store patronage, the authors conducted a survey in Japan, a country that is characterized by its large variety of store formats, the competitiveness of the retail business, EC growth, and the popularity of retail loyalty schemes.

The rest of this paper is organized as follows. First, a literature review on multiple patronage and information searching is presented. Next, methodological issues that include data collection and measurements are discussed. Then, count data analysis is conducted to test the hypotheses by using the data collected through the online survey in Japan. Following this, the analysis and findings are presented. Finally, the study's research implications, contributions, and limitations are discussed.

2. Literature review

2.1 Multiple store patronage

Retail patronage behavior has involved consumer store choices since choice alternatives first appeared (Arnold et al., 1983). Specifically, consumers were previously expected to choose a single store among alternatives in order to maximize utility. Determinants that influence such choices in relation to utility have been analyzed (Pan & Zinkhan, 2006).

Although retail patronage studies often focused on the patronage of a single store, some studies pointed out that consumers use multiple stores for their daily shopping (Baltas et al., 2010; Popkowski Leszczyc & Timmermans, 1997). One way of considering this is to say that when consumers have multiple purposes, they shop at multiple stores (Fox, Montgomery & Lodish, 2004). In other words, consumers use multiple stores or formats to satisfy multiple purposes that cannot be satisfied with a single store. However, a visit to a single store does not necessarily correspond to a single purpose. Gijsbrechts, Campo & Nisol (2008) revealed that even consumers with a single purpose use multiple stores. They explained that consumer multiple store shopping behavior is based on consumer motivation to minimize the cost of shopping.

Other, recent studies have shown an interest in consumer patronage of multiple

stores (Baltas et al., 2010; Luceri & Latusi, 2012; Maruyama & Wu, 2014). This is because most consumers habitually visit, and have loyalty toward, more than one store (Uncles et al., 1995). Baltas et al. (2010) investigated multiple store patronage both conceptually and empirically. For example, multiple store patronage has been conceptualized based on the consumer cost-benefit framework rather than focusing only on cost minimization (Baltas et al., 2010). If the cost to shop and search for information is high, or the benefit of shopping at a primary store is high, consumers use fewer stores.

Prior studies operationalized the patronage set size, which refers the number of patronized stores as a variable for consumer multiple store patronage. Consumer traits and market structure were also considered influential factors on multiple store patronage (table 1).

Table 1 Summary of studies on multiple store patronage

Factor	Variable	Effects	Article
Sociodemographics	Age	-	Baltas et al. (2010)
	Employment	-	Baltas et al. (2010)
	Income	-	Baltas et al. (2010); Maruyama and Wu (2014)
	Female	+	Luceri and Latusi (2012)
	Amount of spend	+	Baltas et al. (2010)
	Shopping frequency	+	Maruyama and Wu (2014)
	Car use	+	Maruyama and Wu (2014)
	Family size	+	Baltas et al. (2010)
	Store brand orientation	+	Baltas et al. (2010)
Perception	Satisfaction	-	Baltas et al. (2010)
	Promotion orientation	+	Maruyama and Wu (2014)
Market structure	Number of competitors	+	Luceri and Latusi (2012)

2.2 Multiple store patronage and information search

Multiple store usage is associated with consumer information search behavior and the issue of consumer loyalty. Dowling and Uncles (1997) considered consumer loyalty polygamous rather than complete loyalty to particular brands. They argued that this polygamous nature prevents companies from conducting successful loyalty programs. Uncles et al. (1995) identified that consumers have divided behavioral loyalty toward multiple stores and that consumers visit multiple stores habitually in the long term.

In addition to divided behavioral loyalty, the novelty seeking of consumers is important. Popkowski Leszczyc & Timmermans (1997) revealed that variety-seeking activity is an important factor in order to understand consumer multiple store usage. A recent study identified that consumers who have high search intentions such as cherry pickers (Fox & Hoch, 2005) use more stores (Maruyama & Wu, 2014). Thus, the relationship between multiple store patronage and information searching is an important issue in order to understand consumer multiple store usage.

The importance of information source has been emphasized in studies on consumer information searches (Beatty & Smith, 1987; Kiel & Layton, 1981; Ratchford, 1982). Consumers' external search for information (e.g., through retailers, media, and interpersonal dimensions) requires effort (Beatty & Smith, 1987). In addition, the costs of information searches and consumers' ability to search for information differ according to each source (Ratchford, 1982). This is because each information source has its own characteristics and these involve different types of cost for consumers. For example, a product-specific specialized information source such as magazines requires consumers to have high familiarity and knowledge about the product (Strebel, Erdem, & Swait, 2004). Further, information from shop assistants requires actual trips to stores; thus, the choice of information source is associated with the intention to visit multiple stores (Beatty & Smith, 1987). Consequently, it is worth studying the relationship between consumer information searches and store patronage behavior in a multiple store usage context.

The Internet is one of the most important information sources to consider for information source usage because the online search for information reduces the cost that consumers pay for purchasing products and acquiring information (Bakos, 2001). Thus, as EC and the online information search infrastructure has developed, consumers have begun to purchase products and search for information in a multichannel environment,

which includes the offline physical store channel as well as the Internet channel (Neslin et al., 2006).

Consumer information source choice behavior has changed in recent multichannel environment. In the early stage of studies on consumer information searches, Ratchford et al. (2003) stated that online and offline information sources are substitutes. However, recent studies have identified the complementary relationship between online and offline channels (Singh et al., 2014). These studies showed that consumer online and offline information channel usage has changed over the last 10 years. This is because even though studies in the 2000s emphasized specific online shopper characteristics (Kau, Tang, & Ghose, 2003; Kaufman-Scarborough & Lindquist, 2002), online shopper segments and traditional offline shopper segments have recently become similar (Ganesh et al., 2010). Singh et al. (2014) also identified that online information from different senders has different impacts on store choice behavior. This shows that a more detailed division of the information sources is required rather than analyzing whether the information is online or offline. Thus, this study aims to analyze the effects of the types of information source on consumer multiple store patronage behavior rather than simply analyzing whether consumers collect information online or offline.

3. Theoretical framework and hypotheses

The concept of multiple store patronage has been debated in relation to the consumer cost-benefit framework (Baltas et al., 2010). This debate is based on household production theory (Becker, 1965), which states that households allocate their resources to maximize their utility. This theory also states that the benefits of shopping activity (e.g., better deals) are balanced against its costs (e.g., money and time) (Baltas et al., 2010; Maruyama & Wu 2014; Reardon & McCorkle, 2002). Thus, consumers compare benefits by visiting more stores that have better deals, are convenient (Clulow & Reimers, 2009), and have product variety, and incur costs such as trip cost and the time it takes to shop (Maruyama & Wu, 2014; Rhee & Bell, 2002). Thus, the variables associated with high incurred costs relate negatively to patronage set size (Baltas et al., 2010; Luceri & Latusi, 2012). However, the variables associated with the higher benefit of visiting multiple stores relate positively to patronage set size (Maruyama & Wu, 2014).

Because multiple store shopping is related to purchasing and searching costs (Baltas

et al., 2010), the variables of the framework are divided into two categories (i.e., the consumer shopping-related dimension and the information search dimension). First, this study employs variables related to consumer purchasing behavior. In particular, the impacts of EC usage and store characteristics will be hypothesized, because EC and store characteristics impact on the consumer costs and benefits of purchasing products (Bakos, 2001; Maruyama & Wu, 2014; Pan & Zinkhan, 2006).

Second, this study employs variables related to consumer information search behavior. In particular, this study focuses on the impact of information source because prior studies have identified the impact of this on the consumer cost-benefit framework (Beatty & Smith, 1987; Kiel & Layton, 1981). Specific hypotheses for each variable will be considered in the rest of this section. Further, this study considers the individual effect of each variable while controlling other variables in the hypothetical framework.

EC usage is expected to influence the consumer cost-benefit relationship (Bakos, 2001). EC reduces consumer purchasing costs in terms of trips to stores. It also cuts opportunity cost by reducing the time needed to visit stores because of the convenience and ease of searching for product information (Szymanski & Hise, 2000). A further benefit is that EC usage is related to personal evaluation of the Internet. EC users think that the Internet is more convenient and reliable, and provides a better service (Choi & Park, 2006; Lee & Johnson, 2002). Thus, EC users are more efficiency-oriented and try to reduce their costs and improve their personal benefits at the same time. Thus, EC has a negative impact on the number of physical store visits (Van Nierop, Leeflang, Teerling, & Huizingh, 2011). Hence, this study proposes the following hypothesis.

H1 E-commerce usage has a negative impact on patronage set size.

The cost-benefit framework is also related to consumer information seeking activity (Ratchford, 1982). In particular, information source has been discussed in prior studies (Beatty & Smith, 1987; Kiel & Layton, 1981). Possible information sources are retail stores; product-specific specialized sources such as magazines; advertisements from manufacturers; and word-of-mouth (WOM) (Strebel et al., 2004). Consumer perception about each information source impacts on the actual channel choice (Strebel et al., 2004). Thus, this study proposes that the intention for information source usage and patronage set size relate to each other based on the cost-benefit framework. In addition,

different types of information source have their own characteristics. Thus, this study proposes that each information source has its own impact on patronage set size based on its characteristics.

A product-specific specialized information source requires consumers to have high familiarity and knowledge about the product (Strebel et al., 2004). Further, highly expertized consumers search for more information (Strebel et al., 2004). Additionally, the Internet reduces the cost of searching for information; indeed, Internet users tend to search for more information in general (Ratchford et al., 2003). Thus, consumers who attach importance to specialized information including both online and offline can improve their benefits by searching for more information. They can also use the Internet to enhance information activity by reducing its cost. Hence, this study proposes the following hypothesis.

H2 The perceived importance that consumers attach to information from specialized sources has a positive impact on patronage set size.

However, when consumers consider that information from shop assistants is important, they collect such information by visiting stores and communicating with the assistants. This is the only source by which consumers can collect information and compare products by physically touching products; however, it involves greater cost than other information sources (Strebel et al., 2004). Thus, consumer appreciation of information from shop assistants leads to fewer patronized stores. Hence, this study proposes the following hypothesis.

H3 The perceived importance that consumers attach to information from shop assistants has a negative impact on patronage set size.

Advertisements are another important information source (Furse, Punj, & Stewart, 1984). Advertising is a passive search activity and affects consumers' prior product knowledge (Moorthy, Ratchford, & Talukdar, 1997). Such prior knowledge facilitates the acquisition of new information (Brucks, 1985). As a result, Strebel et al. (2004) found a positive correlation between advertisements and other information source usage such as stores and specialized information sources. Hence, this study proposes the

following hypothesis.

H4 The perceived importance that consumers attach to information from advertisements has a positive impact on patronage set size.

Strebel et al. (2004) showed that consumers who evaluate high quality from WOM are more likely to search for information from retail stores in order to physically touch products. Thus, information searches based on WOM are positively associated with visiting stores. Hence, this study proposes the following hypothesis.

H5 The perceived importance that consumers attach to word-of-mouth information has a positive impact on patronage set size.

Prior studies have revealed the perceived importance that consumers attach to store characteristics and the impact of this on store patronage behavior (Maruyama & Wu, 2014; Pan & Zinkhan, 2006). However, studies on multiple store patronage have only considered physical store usage even though consumers now purchase products in a multichannel environment that includes the online channel. In the physical store setting, consumers need to visit stores in order to collect information about products as well as details of price and promotion. However, Internet usage for both purchasing and searching reduce consumers' actual store visits. Thus, this study controls the impact of the online factor and examines its impact on multiple store patronage independently.

Product assortment is an important factor. When a store has a wider range of products, consumers can seek variety within the store. Thus, consumers think that product assortment is important because they can seek and compare products in advance in accordance with their priority to achieve higher benefits when making purchases. Hence, this study proposes the following hypothesis.

H6 The perceived importance that consumers attach to product assortment has a positive impact on patronage set size.

Another important characteristic of consumer patronage behavior is promotion. Prior research has identified that loyal customers are not interested in promotions or

advertisements (Carman, 1970). Consumers who attach high importance to price or promotion enhance their potential benefit by visiting several stores to search for better prices and discount information. Such consumers are called cherry pickers (Fox & Hoch, 2005). Prior studies have revealed that price- and promotion-sensitive consumers have lower loyalty (Mägi, 2003) and consumers who attach high importance to price and promotion have a large patronage set size (Maruyama & Wu, 2014). Hence, this study proposes the following hypothesis.

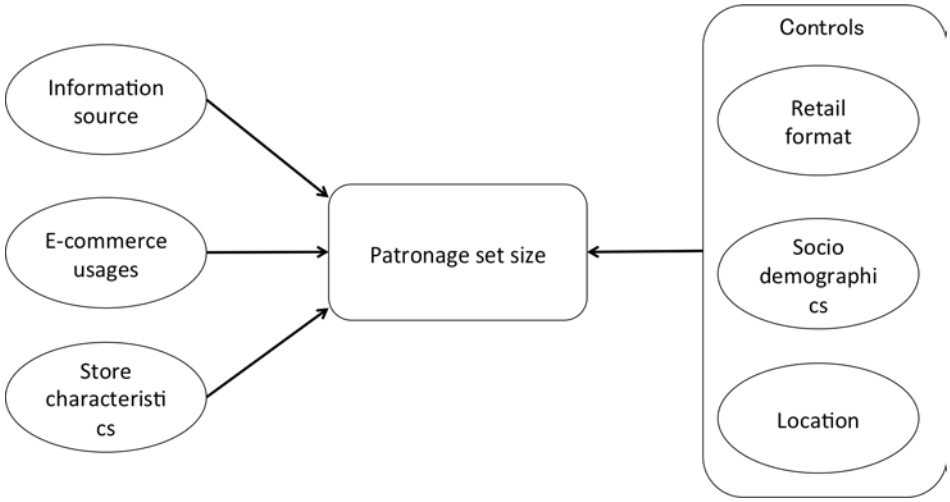
H7 The perceived importance that consumers attach to price and promotion has a positive impact on patronage set size.

Further, this study employs several control variables based on prior research. Pan and Zinkhan (2006) identified that product-relevant factors such as product price, market-relevant factors such as store location, and personal factors such as demographics and psychographics impact on consumer store patronage. Thus, this study controls consumer demographic factors such as gender, age, family size, employment, and store location.

Further, prior studies have only focused on the supermarket format and excluded the impact of the retail format (Baltas et al., 2010; Luceri & Latusi, 2012: Maruyama & Wu, 2014). Instead, this study employs a retail format dummy.

In view of the foregoing integrated arguments, this study proposes a hypothetical framework based on the relationship between patronage set size and EC usage, and between information source and store characteristics. This framework shows the number of stores that consumers visit in a multichannel environment. Because the online channel reduces purchase and search costs, EC and information source usage that include online sources are important factors to consider in the modern multichannel environment. Thus, this study hypothesizes the individual impacts of these factors. Figure 1 shows this study's overall hypothetical framework.

Figure 1 The hypothetical framework of the study



4. Empirical analysis

4.1 Models

This study adopts a count data model because the dependent variable, which is *patronage set size*, is discrete and nonnegative, and there are no excess zeroes in the data. Following prior research (Baltas et al., 2010; Luceri & Latusi, 2012; Maruyama & Wu, 2014), this study uses a Poisson regression model (PRM) because such a model is the standard approach for analyzing count data (Cameron & Trivedi, 2005). The probability function of Poisson distribution can be defined as follows.

$$P(y = j) = \frac{e^{-\lambda}\lambda^{j}}{j!} \qquad (j = 0,1,2, \dots) \tag{1}$$

It is known that Poisson distribution has characteristics of $\lambda > 0$ and $E(y) = Var(y) = \lambda$. Thus, when regressing hypothesized independent variables x_i on the dependent variable y with the PRM, the log-likelihood function is

$$\ln L\,(\beta; y, x) = \sum_{i=1}^{n} [y_i x_i' \beta - \exp(x_i' \beta) - \ln y_i\,!] \tag{2}$$

where $E(y_i|x_i) = Var(y_i|x_i) = \exp(x_i'\beta)$ or $\sigma^2 E(y_i|x_i) = Var(y_i|x_i)$ is the weaker assumption (Wooldridge, 2010).

However, to avoid the overdispersion problem where the variance is greater than the mean (Wooldridge, 2010), this study conducts an overdispersion test (Cameron & Trivedi, 2005) and compares the results between the PRM and negative binomial

models (Cameron & Trivedi, 1986, 1998).

The maximum likelihood analysis of a negative binomial model (Cameron & Trivedi, 1986) is a popular alternative to Poisson regression (Wooldridge, 2010). The probability density function of negative binomial distribution is

$$f(y_i|x_i) = \frac{\Gamma(\alpha+y_i)}{\Gamma(\alpha)\Gamma(y_i+1)}\left(\frac{\alpha}{\lambda_i+\alpha}\right)^{\alpha}\left(\frac{\lambda_i}{\lambda_i+\alpha}\right)^{y_i} \quad (3)$$

where $E(y_i|x_i) = \lambda_i$ and $Var(y_i|x_i) = \lambda_i(1+\alpha^{-1}\lambda_i)$. Further, according to Cameron and Trivedi (1998), based on the assumption that parameter α varies across individuals i (i.e., $Var = (1+\gamma)\lambda_i,\ \gamma = \alpha^{-1}\lambda_i$), the log likelihood function is

$$\ln L(\alpha,\beta) = \sum_{i=1}^{n}\left\{\left(\sum_{j=0}^{j}\ln(j+\alpha\exp(x_i'\beta))\right) - \ln y_i\,! - (y_i+\alpha\exp(x'\beta))\ln(1+\alpha^{-1}) - y_i\ln\alpha\right\} \quad (4)$$

However, based on the assumption that parameter α is constant with each individual (i.e., $\alpha^{-1} = \sigma^2$), the log likelihood function is

$$\ln L(\alpha,\beta) = \sum_{i=1}^{n}\left\{\left(\sum_{j=0}^{j}\ln(j+\alpha)\right) - \ln y_i\,! - (y_i+\alpha)\ln(1+\exp(x'\beta)) - y_i\ln\alpha + y_i x_i'\beta\right\} \quad (5)$$

Model 2 is the PRM, Model 4 is the negative binomial 1(NB1) model, and Model 5 is the negative binomial 2 (NB2) model (Cameron & Trivedi, 2005). This study tests whether the PRM is the appropriate model for estimating the count data that is used, based on an overdispersion test (Cameron & Trivedi, 2005), and compares the estimation results among PRM, the NB1 model, and the NB2 model in order to ensure robustness.

4.2 Data collection

Various store formats have developed in Japan over the past 50 years. These formats

include supermarkets, general merchandise stores (GMS), discount stores, convenience stores, home centers, drug stores, and traditional specialty stores. Thus, Japanese consumers have a wide choice of retail formats. Recently, however, arguments have arisen about the problem of excessive stores due to the concentrated population in the Tokyo metropolitan area and depopulation in other areas (e.g., A.T. Kearney Report, 2010; Simizu, 2013). This means that Japanese retailers face competition, while consumers have an excessive number of retail alternatives. In addition, retailers have conducted various promotions and loyalty schemes in order to gain consumer patronage. For example, one of the major convenience stores, Lawson, has 70 million members in its loyalty program (The Nikkei, 2014).

Further, according to a 2014 report from the Japanese Ministry of Economy, Trade and Industry (METI), even though overall EC sales in Japan are lower than in the two countries with the largest sales volumes, China and the USA, EC sales per Internet user are higher. Further, the diffusion rate among Internet users was 82.8 percent in 2014. Thus, in order to conduct research about information searches and multiple store patronage, the retail business in Japan requires research validity.

The hypotheses are tested using a model developed and applied to the sports shoes market in Japan. Some prior studies critically analyzed consumer behavior in an active sportswear context (Chi & Kilduff, 2011; Fowler, 1999; Ko et al., 2012). In addition, Fowler (1999) reported that sportswear consumers place greater emphasis on comfort and fit attributes when they purchase products. Consumers need to collect information related to these attributes by physically touching the products. Thus, sportswear buyers traditionally visit stores in order to compare products. However, the Internet also impacts on sportswear consumers' behavior. In their research, Ko et al. (2012) gathered sportswear market information and stated that sports shoes is the largest element in the market and that people in countries such as North America, Japan, and Korea spend more on shoes than sportswear. Further, sports shoes are technologically innovative and are highly associated with online information transaction products. For instance, Nike+ (Nike plus), a collaboration between Nike and Apple, connects consumers’shoes, GPS data, and music devices wirelessly and enables such consumers to collect data about their running status (Ramaswamy, 2008).

In sum, even though sports shoes have a traditional characteristic whereby consumers must physically touch products in order to determine the quality of attributes,

in recent years, consumers have begun purchasing sports hoes online. Further, sports shoes are technologically innovative and are a product that is highly associated with online information transactions. Thus, it is pertinent to apply our analysis to sports shoes in order to analyze the relationship between consumer information searching activity that includes online sources and purchasing behavior in the shopping goods context.

In order to analyze the impact of Internet usage on multiple store patronage, this study employed an online survey. The survey was conducted in January 2015 in Japan with consumers who purchase sports shoes at least once a year. The survey data were collected from all regions of Japan. The selection of survey samples was based on the work of the Asian marketing research group, Intage. Intage gathered 7681 respondents. Among the respondents, 4949 people replied to our survey research. For our analysis, 3656 samples were used after some were removed because of missing values. Throughout the process of gathering the data, all appropriate ethical considerations were taken into account.

The demographic characteristics of the samples are presented in Table 2.

Table 2 Demographic characteristics of the survey sample

	Samples	
	Frequency	Percentage
Gender		
Male	2739	74.92
Female	917	25.08
Age		
20-29	803	21.96
30-39	901	24.65
40-49	850	23.25
50-59	615	16.82
60-69	487	13.32
Employment		
Full-time	2557	69.95
Part-time	238	6.51
Students	158	4.32
Others	703	19.22

4.3 Measurements

To measure patronage set size, this study used the number of patronized stores following prior research (Baltas et al., 2010; Luceri & Latusi, 2012; Maruyama & Wu, 2014). Patronage set size was operationalized as the following. If respondents patronized one store, the dependent variable took the value of 0; if they patronized two stores, the dependent variable took the value of 1; and so on.

This study conducted a factor analysis for the characteristic items of stores and employed the average of the factor items (Maruyama & Wu, 2014). By using the principal components with a varimax rotation, the factor analysis results extracted two factors. The first factor represented the width and depth of product assortment and was labeled the “Assortment” factor. However, because the eigenvalue of the second factor was below 1, this study employed only the first factor; items for the second factor were used individually. Table 3 shows the results of the factor analysis and table 4 shows the list of variables.

Table 3 The results of the factor analysis

	F1	(F2)
Assortment		
Assortment width	0.82	
Assortment depth	0.81	
Individual items		
Price orientation		(-0.42)
Promotion rate		(0.41)
Eigenvalues	1.58717	0.25
Cronbach's α	0.87	0.48

Table 4 The list of variables

Variables	Items	Structure	References
Patronage set size	The number of secondary stores	Metric	Baltas et al. (2010); Luceri and Latusi (2012); Maruyama and Wu (2014)
Online purchase	Use e-commerce more than other options when you purchase running shoes	Dichotomous	Choi and Park (2006); Lee and Johnson (2002); Van Nierop et al. (2011)
Information source	How often do you refer to the following information sources when you purchase running shoes?		
Specialized	Specialized magazines and websites (Refer very much=1, otherwise=0)	Dichotomous	Strebel et al., (2004)
Assistants	Advice from shop assistants	Dichotomous	
Advertisement	Advertisements from manufacturers	Dichotomous	
WOM	Word-of-mouth (including Internet)	Dichotomous	
Retail characteristics	How important are the following characteristics to you when you choose a store in order to make a purchase?		
Assortment	Variety of product categories Variety of product types within categories	Average of factor items	
Price	Overall price level is high (R)	Seven-point Likert scale	Maruyama and Wu (2014)
Promotion	The price difference between a bargain and the usual price is large	Seven-point Likert scale	
Control variables			
Age	Respondent's age	Metric	Baltas et al. (2010); Luceri and Latusi (2012); Maruyama and Wu (2014)
Family	Respondent's family size	Metric	
Gender	Respondent's gender	Dichotomous	
Employment	Full-time employment status	Dichotomous	
Location	Primary store's status if located in area with many other stores	Dichotomous	
Sports	Primary store format is sports specialty store	Dichotomous	
Manufacturer	Primary store format is manufacturer's store	Dichotomous	
Outlet	Primary store format is manufacturer's outlet	Dichotomous	
Department store	Primary store format is department store	Dichotomous	
GMS	Primary store format is general merchandise store (GMS)	Dichotomous	

5. Empirical results

The results show that 50.85 percent of the respondents do not patronize more than one store; 35.83 percent patronize two stores; 10.61 percent patronize three stores; 1.21 percent patronize four stores; 0.53 percent patronize five stores; and 0.98 percent patronize six or more stores.

The estimated results of PRM are presented in Table 5.

Table 5 The estimated results of PRM

Dependent variable: *patronage set size*	Poisson regression		
	Coefficient	SE	Z
Online purchase	0.132	0.09	1.44
Specialized	0.209***	0.048	4.02
Assistants	-0.128***	0.046	-2.93
Advertisement	0.023	0.046	1.57
WOM	0.034	0.046	0.62
Assortment	0.042**	0.02	1.92
Price	0.031*	0.018	1.7
Promotion	0.040**	0.017	2.34
Age	0.003	0.002	1.57
Family	0.020*	0.016	1.91
Gender	-0.04	0.052	-0.74
Employment	-0.01	0.048	-0.24
Location	0.094**	0.042	2.23
Sports	0.057	0.048	1.14
Manufacturer	0.119	0.099	1.14
Outlet	0.241***	0.071	3.37
Department store	-0.071	0.192	-0.35
GMS	-0.157	0.176	-0.89
Constant	-1.198***	0.139	-8.49
Obs.	3656		
Log-likelihood	-3970.885		
LR Chi2(16)	99.61***		
Pseudo R2	0.0124		

*** p<0.01; **p<0.05; *p<0.1

For testing the overdispersion of the PRM estimation, this study followed Cameron and Trivedi (2005). The overdispersion problem can be formed as

$$Var(y_i|x_i) = \mu_i + \alpha g(\mu_i) \qquad (6)$$

where α is an unknown parameter and g(·) is a known function. Further, this study assumed $g(\mu) = \mu^2$ because this is the most common assumption (Cameron & Trivedi, 2005). Obviously, if $\alpha = 0$, then $Var(y_i|x_i) = \mu_i$. Thus, overdispersion can be tested based on the null hypothesis $H_0: \alpha = 0$. The model that was used to estimate by ordinary least squares regression is

$$\frac{(y_i - \hat{\mu}_i)^2 - y_i}{\hat{\mu}_i} = \alpha \frac{g(\hat{\mu}_i)}{\hat{\mu}_i} + u_i \qquad (7)$$

where $\hat{\mu}_i = \exp(x_i' \hat{\beta}_i)$, and u_i is a disturbance term (Cameron & Trivedi, 1990). The overdispersion test is presented in Table 6.

Table 6 The overdispersion test

Coefficient	SE	t
0.143 **	0.06	2.38

***p<0.01; **p<0.05; *p<0.1

The result shows that overdispersion is observed (p<0.05). Thus, this study employs the results of the NB1 and NB2 models and compares them. The results of the NB1 and NB2 models are presented in Tables 7 and 8.

Table 7 The results of NB1 model

Dependent variable: *patronage set size*	NB1		
	Coefficient	SE	Z
Online purchase	0.102	0.096	1.05
Specialized	0.205***	0.049	3.82
Assistants	-0.127***	0.048	-2.79
Advertisement	0.03	0.047	1.56
WOM	0.038	0.048	0.7
Assortment	0.045**	0.021	2.01
Price	0.033*	0.019	1.75
Promotion	0.041**	0.018	2.28
Age	0.0029*	0.002	1.63
Family	0.031*	0.016	1.89
Gender	-0.033	0.054	-0.59
Employment	-0.012	0.05	-0.27
Location	0.102**	0.044	2.34
Sports	0.053	0.05	1.03
Manufacturer	0.117	0.103	1.08
Outlet	0.242***	0.074	3.26
Department store	-0.109	0.207	-0.5
GMS	-0.141	0.181	-0.78
Constant	-1.248***	0.146	-8.44
Obs.	3656		
Log-likelihood	-3962.285		
LR Chi2(16)	97.02***		
Pseudo R2	0.0121		

***p<0.01; **p<0.05; *p<0.1

Table 8 The results of NB2 model

Dependent variable: *patronage set size*	NB2		
	Coefficient	SE	Z
Online purchase	0.131	0.094	1.37
Specialized	0.211***	0.049	3.91
Assistants	-0.129***	0.048	-2.86
Advertisement	0.022	0.047	1.52
WOM	0.034	0.048	0.6
Assortment	0.042**	0.021	1.86
Price	0.031*	0.019	1.64
Promotion	0.040**	0.017	2.28
Age	0.0027	0.002	1.5
Family	0.030*	0.016	1.84
Gender	-0.04	0.054	-0.72
Employment	-0.01	0.05	-0.24
Location	0.094**	0.044	2.15
Sports	0.057	0.05	1.12
Manufacturer	0.117	0.104	1.09
Outlet	0.243***	0.074	3.25
Department store	-0.077	0.199	-0.37
GMS	-0.159	0.181	-0.88
Constant	-1.198***	0.144	-8.19
Obs.	3656		
Log-likelihood	-3964.739		
LR Chi2(16)	92.11***		
Pseudo	0.0115		

***p<0.01; **p<0.05; *p<0.1

The results show that the NB1 model has better values for log-likelihood (-3962.285 for the NB1 model; -3964.739 for the NB2 model), likelihood ratio (97.02 for the NB1 model; 92.11for the NB2 model), and Pseudo R^2 (0.0121 for the NB1 model; 0.0115 for the NB2 model). Thus, this study discusses the results of the NB1 model.

Although the results fail to show that EC usage has a significant effect on *patronage set size*, specialized information sources, including the online information channel, have a positive effect on *patronage set size* (p<0.01). Thus, H2 is supported, while H1 is not supported. With regard to the other results, as expected, information from shop assistants (*assistants)* has a negative impact on *patronage set size* (p<0.01); the perceived importance of store assortment (*assortment*) proves to be significant (p<0.05); and *price* (p<0.10) and *promotion* (p<0.05) also have positive effects. With regard to the control variables, *age* (p<0.10), family size (*family*) (p<0.10), *location* (p<0.05), and *outlet* (p<0.01) are all significant. However, *advertisement* and *WOM* do

not have a significant effect on *patronage set size*. Thus, the research results fail to support H1, H4, and H5, although the other hypotheses are supported.

6. Discussion

The research examined the main effects of information types, EC usage, and store characteristics on multiple store patronage by using data from Japan. The results show that WOM, including online sources, does not have a positive impact on patronage set size, although specialized information sources, including online sources, have a positive impact. Prior studies showed that online users tend to search for more information in general (Ratchford et al., 2003). Despite this, the present study does not show that the online information channel is always effective with regard to patronage set size. Instead, this study shows that different information sources affect patronage set size differently whether or not the information is from an online source.

Further, as expected, consumer emphasis on information from shop assistants has a negative impact on patronage set size. Information from shop assistants is the only channel that consumers have when they visit stores and communicate with assistants. Consumers were expected to visit fewer stores because the search cost for this information channel is high.

The research reveals the significance of the perceived importance of store characteristics such as product assortment, price, and promotion with regard to patronage set size. This is consistent with the prior research (Maruyama & Wu, 2014).

With regard to control variables, this study confirms the effect of store location on patronage set size. In particular, the results show that patronage set size is wider if the primary store is located in an area with a larger number of stores, which is consistent with Luceri and Latusi (2012). The retail format is also significant. In particular, the outlet dummy has a positive impact on patronage set size. Outlet stores are generally located in outlet shopping malls. Thus, outlet stores are surrounded by many other stores in the outlet mall. As a result, patronage set size is wider if the primary store is an outlet store because trip and search costs are low.

Hypothetically, the authors expected that EC users would avoid paying the extra cost of visiting more physical stores. Despite this, the results show that EC usage does not have a significant impact on patronage set size. There are two possible interpretations of this result. First, Ganesh et al. (2010) found some similarities between

the online shopper segment and traditional offline shopper segment as Internet use has grown. Thus, the characteristics of EC users might not be relevant.

Second, the empirical setting of this study possibly influences the result. This study uses sports shoes as a product category to test the hypotheses. From the consumer perspective, convenience goods such as groceries have lower perceived risk and lower search intention than other types of goods such as shopping goods and specialty goods (Holton, 1958). Thus, differences between EC and non-EC users with regard to search activity might have been weak.

This study's results about the impact of age differ from those of Baltas et al. (2010). Baltas et al. (2010) showed that age has a negative effect on patronage set size because the search and trip costs increase as consumers become older. However, the result of this study is consistent with Singh et al.'s (2014) finding that in the context of durable goods, older consumers tend to collect information from offline physical stores. Sports shoes are shopping goods, even though they are not durable goods; thus, the product’s characteristics possibly play an important role in moderating the impact of age on patronage set size.

7. Conclusion

This study examined the effects of information sources on multiple store patronage and found that different information sources affect patronage set size differently whether or not the information is from an online source. Two theoretical implications are proposed from the findings. First, this study reveals the importance of the detailed effects of information sources on store patronage rather than considering whether consumers choose online or offline channels. The results show that different types of information seeking have different effects on multiple store patronage. Prior studies claimed that the Internet reduces consumer search cost; thus, information collection from the Internet changes consumer search behavior (Bakos, 2001; Strebel et al., 2004). However, this study reveals that information sources such as specialized magazines, expertise, and WOM play important roles and lead to the patronage of particular stores. Consequently, information searches through the Internet do not necessarily influence multiple store patronage.

From a management perspective, this result indicates that different types of information have different impacts on consumer shopping behavior, a finding that helps

managers to develop their information strategies. For example, it is better for managers to concentrate on training shop assistants rather than relying on online WOM in order to encourage consumers to patronize their stores.

Second, this research extends studies on multiple store patronage by focusing on shopping goods and different types of retail format. This study's findings with regard to price and promotion (Maruyama & Wu, 2014), market structure (Luceri & Latusi, 2012), and family size (Baltas et al., 2010) are consistent with prior studies. However, consumers have a higher search intention for sports shoes than for groceries. In addition, older people use their free time to search and visit more stores. This result differs to that of prior studies in the grocery supermarket context (Baltas et al., 2010; Luceri & Latusi, 2012; Maruyama & Wu, 2014).

Further, this study reveals the impact of the primary store format on multiple store patronage. Specifically, this study shows that consumers who make purchases at manufacturers' outlets visit more stores. Prior studies have been mainly concerned about the impact of consumer characteristics and market structures (Barros et al., 2010; Luceri & Latusi, 2012; Maruyama & Wu, 2014); thus, the current study is the first to show the impact of retailers' approach on multiple store patronage.

The limitations of this study are as follows. The ways in which consumers allocate their resources, such as the amount of spend, and optimize their shopping trips to multiple stores are not considered and should be explored in future studies. The impact of the Internet should also be controlled more than it is in this study in terms of the dimensions of influence (e.g., specialized information sources and WOM). Thus, further studies are required to identify the impact of the Internet in the context of information sources. Moreover, offline WOM, offline specialized sources, online WOM, and online specialized sources may differ from each other. Such areas require more detailed analytical work.

Further, this study finds product-type impacts on multiple store patronage. Prior studies claimed that from the consumer perspective, convenience goods have lower perceived risk and search intention than shopping goods (Holton, 1985). Thus, perceived risk is a possible antecedent to patronage set size. Hence, research on the impact of perceived risk on patronage set size is required.

Glossary

Cost-benefit framework: a basic structure that underlies the concept of assessing the relation between the cost of undertaking a purchase and the value of the benefits of undertaking the purchase in a certain way.

Information source: a source of information for consumers who intend to buy a product.

Multichannel environment: an environment in which there is more than one channel for obtaining information and purchasing products.

Multiple store patronage: the concept of making purchases at more than one store.

Patronage behavior: the way in which consumers behave with regard to patronizing particular stores and patronizing one or more stores.

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