Consumer Motivations in Browsing Online Stores with Mobile Devices

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ABSTRACT: In this study, we examined the effects of consumer motivations on browsing online stores with mobile devices, and compared them with those on browsing physical stores. The results of the simultaneous analysis in multiple populations with structural equation modeling showed that four kinds of motivations affect browsing mobile-based online stores, whereas three motivations affect browsing physical stores. This study implied that idea motivation is the most important determinants of both mobile and offline browsing. Also, it is implied that adventure motivation and value motivation are important for mobile-based online stores, whereas gratification motivation is important for physical stores. This is the first study to examine the determinants of browsing intention both in physical stores and mobile-based online stores and will contribute to our understanding of browsing activity.

KEY WORDS AND PHRASES: Browsing, mobile-based online store, mobile consumers, hedonic shopping motivations, simultaneous analysis in multiple populations with structural equation modeling.

Recently, it has become more important for retailers to take care of m-consumers (mobile consumers). Mobile devices such as PDAs, mobile telephones, smart phones, and tablet computers have been defused rapidly all over the world. Mobile cellular telephone subscriptions, for example, increased from 2.2 billion in 2005 to 5.1 billion in 2010 in the world (www.Wireless-center.net). Mobile telephones are now used not only in developed countries, but also in developing countries. The global adoption and diffusion of mobile devices results in the rapid growth of m-commerce (mobile commerce). For example, m-commerce market size in the US was reported to be worth 127 million US dollars in 2011 and it has now risen to over 50 billion US dollars (www.Wireless-center.net).

As mobile devices and m-commerce has grown rapidly, it is expected that more and more consumers are expected to browse retail stores on mobile devices. Bloch, Ridgway, and Sherrell [9] defined the term of browsing as "the in-store examination of a retailer's merchandise for informational or recreational purposes without an immediate intent to

buy" and suggested that even if browsers do not have any buying intentions, they may make unplanned purchases, buy at a later date, or facilitate their word-of-mouth activities, which aids others in purchasing. Thus, it is necessary for marketing scholars and practitioners to find the determinants of browsing.

Browsing researchers have proposed a conceptual model which describes that two determinants, retail environment and consumer characteristics, affect consumer browsing, which, in turn, affects the degree of the achievements of the informational and recreational reasons of browsing activity [9]. Also, they have investigated differences between shoppers with a purchase intention and browsers without a purchase intention. However, no browsing researchers have explored the informational and recreational reasons as to why consumers browse retail stores without a purchase intention.

Note that previous research regarding browsing activity has assumed consumers browsing in physical stores. Although some researchers refer online information search and its determinants and consequences [42], browsing in mobile-based online stores has not been investigated. Also, browsing in mobile-based online stores might be different from that in physical stores.

Thus, the purpose of this study is to examine the effects of consumer motivations on browsing online stores with mobile devices, and compared them with those on browsing physical stores.

Literature Review

In-store Browsing

Although it is very common for consumers to browse retail stores, this in-store browsing has not been studied sufficiently yet. To fill this gap, Bloch, et al. [9] developed a conceptual framework describing that retail environment and product involvement affect two kinds of browsing benefits, information and recreation, which affect browsing activity, in turn. Based on the conceptual framework, the authors divided respondents into three groups—non-browsers, light browsers, and heavy browsers—and empirically tested the difference among the group using MANOVA and ANOVA. This study implied that consumers visit retail stores not only to purchase products, but also to get information and for recreation without intentions toward purchasing any products. However, Bloch, et al. [9] did not provide empirical evidence that information and recreation are two determinants of browsing activity.

Xia [46] examined consumers' browsing experience and their determinant factors. Interviews were utilized to investigate when, where, and how they browse. After the interview, the researcher observed informants' shopping behaviors. According to the author, this qualitative research suggested that browsing serves both functional and recreational purposes. However, like Bloch, et al. [9], she did not quantitatively test the relationship between browsing and the determinants. Moreover, unlike previous research [2,3], she broadened the concept of "browsing" to include shopping with a purchase intention.

More recently, Reynolds, Jones, Musgrave, and Gillson [33] examined the differences of time spent in stores, utilitarian/hedonic shopping value, and satisfaction, and the other consequent variables among three types of consumers—browsers who made a purchase, browsers who did not make a purchase, and shoppers who visited the store intending to make a purchase. This study proposed a new topic regarding browsing activity. However, it was not closely related to the existing topic—the relationship among browsing activity and their determinants and consequences.

Relationship between Browsing Motivation and Intention

What is the motivation of in-store browsing for consumers? Related to this issue, Babin, Darden, and Griffin [3] developed scale items assessing consumers' evaluations of a shopping experience along two important dimensions—utilitarian and hedonic values. They claimed that shopping value can be classified into these two dimensions [6,34,39,40]. Utilitarian shopping value is related to the motivation to procure the product or to complete the mission [6,37], while hedonic shopping value is related to the motivation to satisfy sensual and emotional needs during the shopping process [3,6,34,35,39,40], which include the aforementioned informational and recreational shopping needs [2,9]. Babin, et al. [3] performed focus group interviews twice and generated 71 scale items. Principal component analysis and confirmatory factor analysis were then utilized to develop eleven items of hedonic shopping value and four items of utilitarian value. In the context of this study, Babin, et al.'s research [3] is important in terms that shopping values were divided into utilitarian and hedonic aspects and the scale items for the latter aspects were developed to measure shopping values without purchasing any products. It can be said that they implied that hedonic shopping values are determinants of in-store browsing.

Note that unlike shopping motivation with a purchase intention, browsing motivation

should be investigated only from a hedonic viewpoint. This is because, by definition, browsing activity is the examination of products without an immediate intention to buy and is thus not related to the utilitarian value to complete the mission to procure the product [9]. In the previous research, browsing is understood as ongoing search behavior in a retail store for informational and/or recreational purposes and without immediate intentions to purchase [8,9]. In fact, Arnold and Reynolds [2] implied that browsing was related to hedonic motivations—not to utilitarian motivations. For example, a little boy, who has neither money nor drivers' license, can visit car dealers and/or their websites to enjoy browsing cars. Browsing intention can be thus identified as part of a hedonic-oriented behavior.

In this aspect, Westbrook and Black [43] has a limitation because they did not distinguished utilitarian and hedonic motivations when they proposed seven shopping motivations—anticipated utility, role enactment, negotiation, choice optimization, affiliation, power and authority, and stimulation. In contrast, Arnold and Reynolds [2] proposed purely hedonic shopping motivations. After reviewing Babin, et al. [3], Westbrook and Black [43], and other previous studies, they investigated reasons why consumers go shopping, how they felt when shopping, and the benefits they received from shopping. As a result of exploratory factor analysis, six types of shopping motivations was recognized—value motivation, role motivation, adventure motivation, social motivation, gratification motivation, and idea motivation.

Value motivation refers to shopping for sales, looking for discounts, and hunting for bargains. While value motivation is related to the informational reasons for browsing, the other kinds of motivations are related to recreational reasons for browsing [9,13]. Role motivation refers to the enjoyment that consumers acquire in the process of shopping for others and the excitement and intrinsic joy felt by shoppers when finding the suitable gift for others. Adventure motivation refers to stimulation, adventure, and the feeling of being in another world when in shopping places. Social motivation refers to enjoyment with friends and family in shopping. Gratification motivation refers to the stress relief effects of shopping. And idea motivation refers to shopping to keep up with trends and new fashions.

Although the main objectives of Arnold and Reynolds' research [2] is to cluster shoppers into five groups based on their six hedonic shopping motivations, they estimated correlations between these six hedonic shopping motivations and browsing activity in order to test predictive validity of scale items of these motivations. As a result of correlation analysis, they found their six hedonic motivations are highly correlated with browsing activity.

Relationships between Electronic Browsing Motivations and Intention

In the field of electronic commerce, To, Liao, and Lin [39] proposed a structural equation model which contains five determinants of information search intention in online stores—adventure, social, idea, value, and authority and status, of which, the former four motivations were from Arnold and Reynolds [2] and the latter one motivation was from Westbrook and Black [43]. Their research is, to our knowledge, the only study examining the relationship between search motivations and intention in the context of electronic commerce. However, their research has various limitations: First, without any empirical investigation, they did not incorporate two of Arnold and Reynolds six hedonic shopping motivations into their model. Second, three of the four motivations that they incorporated into their model were insignificant in their empirical test. Third, they additionally incorporated "authority and status" motivation from Westbrook and Black, which Arnold and Reynolds had dropped from their six hedonic shopping motivations because it could be covered by value motivation. Fourth, they mixed online browsers with a personal computer into online shoppers with a mobile device when they collected data. And fifth and finally, they did not compare online and offline browsers using the simultaneous analysis in multiple populations to their structural equation model.

Hypotheses

In this study, Arnold and Reynolds' six hedonic shopping motivations [2] will be applied in order to examine the effects of consumer motivations on browsing online stores with mobile devices, and compared them with those on browsing physical stores. Most previous research regarding in-store browsing activity has assumed consumer browsing in physical stores and only few research has been done on online browsing. Neither did they investigate mobile-based online browsing nor did they compare online browsing with offline browsing. Thus, when developing a model describing consumer motivations affect intention toward browsing mobile-based online stores, we compare mobile-based online browsing with offline browsing. In this study, we neglect computer-based online browsing because it is difficult to conduct the simultaneous analysis in three and more populations with structural equation modeling.

Value Motivation

Value motivation refers to shopping for sales, looking for discounts, and hunting for bargains [2]. Chandon, Wansink, and Laurent [12] found that consumers enjoyed searching discounted products or sale items in physical stores even if they did not have any buying intention, and concluded that searching discounted products can be a means of increasing shoppers' prestige and achieving higher social status or group affiliation. Also, Cox, Cox, and Anderson [13] implied that consumers tend to be drawn to shopping's more private pleasures, particularly the enjoyment of bargain hunting. According to their research, about three quarters of consumers reported that they enjoyed hunting for and finding bargains. Among them, some consumers might be satisfied with just finding discount products.

To, et al. [39] found that the effect of value motivation on online search intention was not significant and concluded that consumers could not receive any benefits from the bargains, or pleasant sensations during the bargaining process because Internet shopping does not have a bargaining mechanism. However, there are many online stores offering discounted products nowadays. In fact, Wolfinbarger and Gilly [44] found that consumers enjoyed searching discounted products in online stores. Thus, it could be said that consumers may enjoy searching bargain not only in physical, but also online stores. Particularly, with mobile devices, such as PDAs, mobile telephones, smart phones, and tablet computers, browsers can enjoy searching discounted items anywhere, anytime they would like [29].

It may be easier and more efficient to search discounted products online with mobile devices than to search them in physical stores. Lohse and Spiller [25] claimed that in physical stores, consumers typically have to spend more time and make more effort in order to shop around to find the lowest price, whereas they can more readily search which store offers lowest price online with mobile devices. Moreover, according to Degaratu, Rangaswamy, and Wu [14], consumers' price sensitivity is higher in online stores than in physical stores. Therefore, mobile browsers might be more likely to enjoy searching for discounted products compared to offline browsers. Thus,

> *H_{1a} Value motivation has a positive effect on browsing intention in physical stores.*
> *H_{1b} Value motivation has a positive effect on browsing intention in online stores with mobile devices.*
> *H_{1c} The effect of value motivation on browsing intention is stronger in mo-*

bile-based online stores than in physical stores.

Role Motivation

Role motivation refers to the enjoyment that consumers acquire in the process of shopping for others and the excitement and intrinsic joy felt by shoppers when finding suitable items for others [2]. Some consumers play social roles through shopping for their friends and family even if they do not have intended to purchase the items for them.

As discussed by Parsons [30], the development of Internet technology enables consumers to save time and increases convenience in playing these social roles and as such, role motivation exists not only in physical stores, but also in online stores. To, et al. [39] excluded role motivation from their model because they assumed that it was a utilitarian motivation. However, browsing may be related to social roles if browsing results in useful information for friends and family. In fact, Arnolds and Reynolds [2] found that this motivation was correlated with browsing activity.

As information technology progresses, it becomes convenient for consumers to browse retail stores online with mobile devices [29], and such convenience makes it easier for consumers to find the suitable gift for others. As discussed above, browsers can easily search retail stores online with mobile devices [25]. Thus, browsers who want to play social role through shopping for friends and family may intend to visit and explore mobile-based online stores.

Exploring products in mobile-based online stores may be more efficient than those in physical stores. According to Lim and Dubinsky [24], consumers typically have to spend more time and make more effort in order to shop around physical stores to complete their social role, whereas they can more easily complete their role online. Thus,

H_{2a} Role motivation has a positive effect on browsing intention in physical stores.
H_{2b} Role motivation has a positive effect on browsing intention in online stores with mobile devices.
H_{2c} The effect of role motivation on browsing intention is stronger in mobile-based online stores than in physical stores.

Adventure Motivation

According to Westbrook and Black [43], adventure in retail stores means that customers encounter something novel and interesting, and experience the joy of exploration during the shopping process. Based on this definition, Adventure motivation is defined as shopping for stimulation, adventure, and the feeling of being in another world [2].

Arnolds and Reynolds [2] claimed that significant number of people go shopping to pursue the adventure of a shopping trip. Wakefield and Baker [40] found that some consumers received enjoyment from the sensory attributes of the store atmosphere—its sights, sounds, and smells. Moreover, Cox, et al. [13] implied that one of the main attractions of shopping is stepping outside of the house, i.e., experiencing a change in physical environment.

Consumers may experience a sense of curiosity during the interaction with computers. Webster, Trevino, and Ryan [42] claimed that when they visit online stores which they have not visited before, they feel adventurous. That means that some consumers have adventure motivation even in online stores. Particularly, browsing online stores with mobile devices is a relatively new custom and, thus, shoppers may feel novelty during the shopping process. Therefore, browsers who want to experience the joy of exploration in shopping may intend to visit mobile-based online stores.

It seems that exploring in mobile-based online stores is different from those in physical stores. In physical stores, shoppers may be likely to feel diversion because they are able to receive enjoyment and pleasure of shopping with five senses. On the other hand, mobile browsers may hardly feel sensory attributes and change of atmosphere—such as scene, sound, and smell—with small screens of mobile devices [23]. However, as discussed above, mobile browsers may be able to feel novelty, which is a key characteristic of the adventure in retail stores [42]. They may feel thrills through perceiving new stimulations. Thus,

> *H_{3a} Adventure motivation has a positive effect on browsing intention in physical stores.*
> *H_{3b} Adventure motivation has a positive effect on browsing intention in online stores with mobile devices.*
> *H_{3c} The effect of adventure motivation on browsing intention is stronger in mobile-based online stores than in physical stores.*

Social Motivation

Social motivation refers to shopping for enjoyment with friends and family [2]. Consumers enjoy socializing with others while shopping, and provide an opportunity to bond with other shoppers. Thus, consumers are likely to browse physical stores because of social motivation. Arnolds and Reynolds [2] found that this motivation was correlated with browsing activity.

Some consumers also browse online stores with social motivation. The development of Internet technology enables consumers to access online stores with mobile devices. As a result, consumers can more easily shop online anytime, anywhere they are with friends and family. Kaufman-Scarborough and Lindquist [21] claimed that like shopper in physical stores, online shoppers enjoy gathering and sharing information through online chat rooms and buyer forums. Consumers may enjoy gathering and sharing information online with friends and family. Thus, consumers with social motivation would be likely to browse online stores with mobile devices.

However, browsers who want to enjoy shopping with friends and family may prefer physical stores because they can feel the merchandise and stimulate all five senses in the physical stores [23]. In general, traditional word of mouth (WOM) is the information that one obtains through face-to-face communications among friends and family [20], whereas electronic word of mouth (eWOM) is related to communications among a multitude of people and institutions via the Internet—not among friends and family [38]. Moreover, To, et al. [39] found that the effect of social motivation on search intention in online store was insignificant, and concluded that it might not be important for consumers not only to communicate with their friend and family online, but also to get popularity in the Internet community. Therefore, the effects of social motivation on browsing intention may be weaker in mobile-based online stores with mobile devices than in physical stores. Thus,

> *H_{4a} Social motivation has a positive effect on browsing intention in physical stores.*
> *H_{4b} Social motivation has a positive effect on browsing intention in online stores with mobile devices.*
> *H_{4c} The effect of social motivation on browsing intention is stronger in physical stores than in mobile-based online stores.*

Gratification Motivation

Gratification motivation refers to shopping for stress relief, shopping to relieve a negative mood, and shopping as a special treat to oneself [2]. McGuire [26] claimed that consumers are motivated to act in such a way as to reduce tension, thereby maintaining their inner equilibrium and returning the self to a state of homeostasis. Also, Babin, et al. [3] regarded the value of shopping as a type of therapeutic activity.

To, et al. [39] claimed that gratification value is perceived only through actual purchasing. They assumed that e-customers will hardly know how the actual product feels and looks or understand the stimuli from the store environment and, thus, excluded the motivation from their model. However, Parsons [30] found that online shopping also offered a diversion from the routine of daily life. It can therefore be said that gratification motivation applies not only to physical stores, but also to online stores. Particularly, with mobile devices, consumers can more easily shop online anytime, anywhere they would like to relieve a negative mood with shopping.

However, in mobile-based online stores, consumers are only able to view the display screen of a mobile phone or a tablet computer and as such, may not be less strongly attracted to browse the online stores when they wish to relieve stress with browsing. Conversely, in physical stores, consumers can experience elements of the store atmosphere with the five senses [24]. Thus,

> *H_{5a} Gratification motivation has a positive effect on browsing intention in physical stores.*
> *H_{5b} Gratification motivation has a positive effect on browsing intention in online stores with mobile devices.*
> *H_{5c} The effect of gratification motivation on browsing intention is stronger in physical stores than in mobile-based online stores.*

Idea Motivation

Idea motivation is defined as a motivation to keep up with trends and new fashions and to see new products and innovations [2]. Bloch, et al. [9] found that consumers enjoyed browsing physical stores to obtain information as an end in itself. Also, Arnolds and Reynolds [2] found that this motivation was correlated with browsing activity.

To, et al. [39] found that the effect of idea motivation on search intention was insig-

nificant and concluded that consumers thought that shopping online to get new ideas is not important. However, previous researchers have implied the advantage of Internet shopping in terms of information acquisition. Alba [1], for example, found that comparison convenience in online stores makes it easier for consumers to collect unfamiliar information about brands or retail stores. Also, Parsons [30] implied that one of the strongest motivations for Internet shoppers was to find, assess, and appreciate trends and new fashions because many of them can access information that would otherwise be unavailable. It might be the case in mobile browsing. Moreover, browsers who want to find information on trends would try to update their knowledge of new information at any given time. Thus, they may intend to visit mobile-based online stores.

As mentioned above, there is a difference in the speed of information acquisition between exploring products in mobile-based online stores and physical stores. In mobile-based online stores, browsers are free from the time constraint present in physical stores. Therefore, browsers who think highly of the speed of information acquisition might prefer browsing online stores with mobile devices rather than in physical stores. Thus,

H_{6a} Idea motivation has a positive effect on browsing intention in physical stores.
H_{6b} Idea motivation has a positive effect on browsing intention in online stores with mobile devices.
H_{6c} The effect of idea motivation on browsing intention is stronger in mobile-based online stores than in physical stores.

Methodology

Simultaneous Analysis in Multiple Populations with SEM

The purpose of this study is to examine the effects of consumer motivations on browsing online stores with mobile devices, and compared them with those on browsing physical stores. To compare mobile browsing with offline browsing, we seek to estimate a pair of browsing intention models using two dataset regarding consumers' browsing experiences in physical stores and mobile stores. To estimate and compare coefficients of the two browsing intention models, a simultaneous analysis in multiple populations with structural equation modeling is conducted using Amos 19.

Questionnaire and Sampling Procedure

For structural equation modeling, we applied multiple scales that were developed based on previous studies [2,4,5,6,45] (see Appendix 1 for scale items). All scale items originally developed in English were translated into Japanese in order to administer the questionnaire in Japan, where the percentage of people who use the Internet is relatively higher (78.2%) and a large amount of people used Internet with not only desktop computers, but also mobile devices (over 70 million people) [28]. To enhance translation equivalence, we had the Japanese version of the questionnaire translated into English by two people fluent in both languages. Differences were then reconciled. All items were measured on a 7-point Likert scale from 1 (Strongly Disagree) to 7 (Strongly Agree).

Questionnaires were administered in undergraduate courses at the school of business in a private university in Tokyo. Although student sample is a type of nonprobability, convenient sampling, it is somewhat adequate for the mobile consumer research in Tokyo because the percentage of Internet users aged 20 to 29 is the highest (97%) [28]. A total of 1,450 completed responses, of which 1,406 were deemed usable after list-wise deletion (97%). Of these, 55.6% (782) were male, while 44.4% (624) were female, suggesting a typical male to female ratio. They were in their early 20s and homogeneous in age. Respondents had enough experience with both mobile-based online stores and physical stores: All respondents answered "usually" or "always" to the question "how often do you browse a retail store (mobile-based online store/physical store)" and no one answered "sometimes," "occasionally," or "never" to the question. Respondents were randomly divided into two groups: For one group, we asked to imagine their most recent shopping situation in a specific mobile-based online store; and for the other group in a physical store. Then, respondents in both groups were asked to fill out the same questionnaire mentioned above.

Reliability and Validity of Scales

To establish construct reliability as well as convergent and discriminant validity, we utilized some measures—Cronbach's alphas, composite reliability (CR), average variance extracted (AVE), maximum shared squared variance (MSV), and average shared squared variance (ASV).

All Cronbach's Alpha values were above the 0.80 (ranging from 0.85 to 0.94), indicating that the scales had a high reliability. Also, CRs were all above 0.7 (ranging from

0.87 to 0.94), indicating the scales had high internal consistency and good reliabilities [15,28].

Meanwhile, AVEs were more than 0.50 (ranging from 0.57 to 0.81), and less than CRs, indicating adequate convergent validity [15,17]. Also, we found that MSVs and ASVs were less than AVE thresholds, indicating discriminant validity. Those measurements are all summarized in Appendix 1 with factor loadings.

Factor loadings were also in acceptable ranges (0.55 to 0.97) and significant at the 1% level, which provides another evidence of convergent validity. Correlations among constructs are shown in Table 1.

All items were randomly divided into two groups and converted into the mean for each group as manifest variables of the structural models [5].

Construct	1	2	3	4	5	6	7
1. Value Motivation	0.77						
2. Role Motivation	0.27	0.83					
3. Adventure Motivation	0.23	0.23	0.76				
4. Social Motivation	0.15	0.43	0.36	0.80			
5. Gratification Motivation	0.26	0.33	0.72	0.38	0.77		
6. Idea Motivation	0.33	0.27	0.50	0.25	0.55	0.76	
7. Browsing Intention	0.35	0.24	0.49	0.17	0.54	0.66	0.90

Table 1. Correlations among Constructs

Common Method Variance

Artificially common method bias might inflate observed relationships between variables because predictor and criterion variables were gathered from the same respondents in this study. Therefore, Harman's single factor test was performed as post hoc remedy [18,31,32]. This test consisted in loading all the variables in the study into an exploratory factor analysis and examined the unrotated factor solution to determine the number of factors that are necessary to account for the variance in the variables. If common method variance existed, a single factor would emerge from a factor analysis of all questionnaire measurement items, or one general factor that accounted for most of the variance would result [32]. As a result, factor analysis revealed five factors with eigenvalues greater than 1.0 that accounted for 81.8% of the total variance. The first factor only accounted for 44.1% of the variance, suggesting that common method variance was not a serious problem in our study.

Between-Group Fit Comparison

In this study, as mentioned above, a simultaneous analysis in multiple populations is conducted using two dataset regarding consumers' browsing experiences in physical stores and mobile stores. To test construct invariance, i.e., whether the same model can be applied for the two groups, fit comparison between two models for each group is needed before estimating the overall model.

The chi-square value for the independence model of offline browsing was 3660.46 and the degree of freedom was 105, whereas the chi-square value for the independence model of mobile-based online browsing was 4626.82 and the degree of freedom was 105. As a result, the percentage contribution to the chi-square (44.17% and 55.83%, respectively) showed that the fits of the two groups are about the same. Also, RMSR for the two groups were 0.08 and 0.10, respectively. Again, this indicates it is safe to conclude that the models fit almost equally well—or badly—for both offline browsing consumer group and mobile-based online browsing consumer group.

Results

Measurement Model

Before estimating the structural model, the measurement model was assessed. The chi square value for the model was 421.55 and the degree of freedom (df) was 70. Although the chi-square/df ratio was greater than recommended level of 3.00 [10], the goodness of fit index (GFI) and the GFI adjusted by the degrees of freedom (AGFI), that assess how well an a priori model reproduces the sample data, were 0.92 and 0.86, respectively. Both indices were higher than the recommended level of up to 0.90 and 0.80, respectively [19].

The value of the root mean square error of approximation (RMSEA), a parsimony measure that accounts for potential artificial inflation due to the estimation of many parameters, was 0.09, which was slightly above the threshold of 0.08, indicating a moderate fit of the model [12,36].

The standardized root mean square residual (SRMR), the positive root of the unweighted average of squared fitted residuals, were 0.04. As previous research claimed that well-fitting models will have SRMR less than 0.08 [19], the value indicate a close fit of the data to the model. The normed fit index (NFI), an incremental fit index that

measures the proportionate improvement in fit by comparing a target model with a more restricted, nested baseline model, was 0.95. Regarding NFI, values of 0.9 and above are indicative of a satisfactory fit of the model [16,19].

Structural Model

The structural model also fit the data well. The results are summarized in Figure 1 and Table 2.

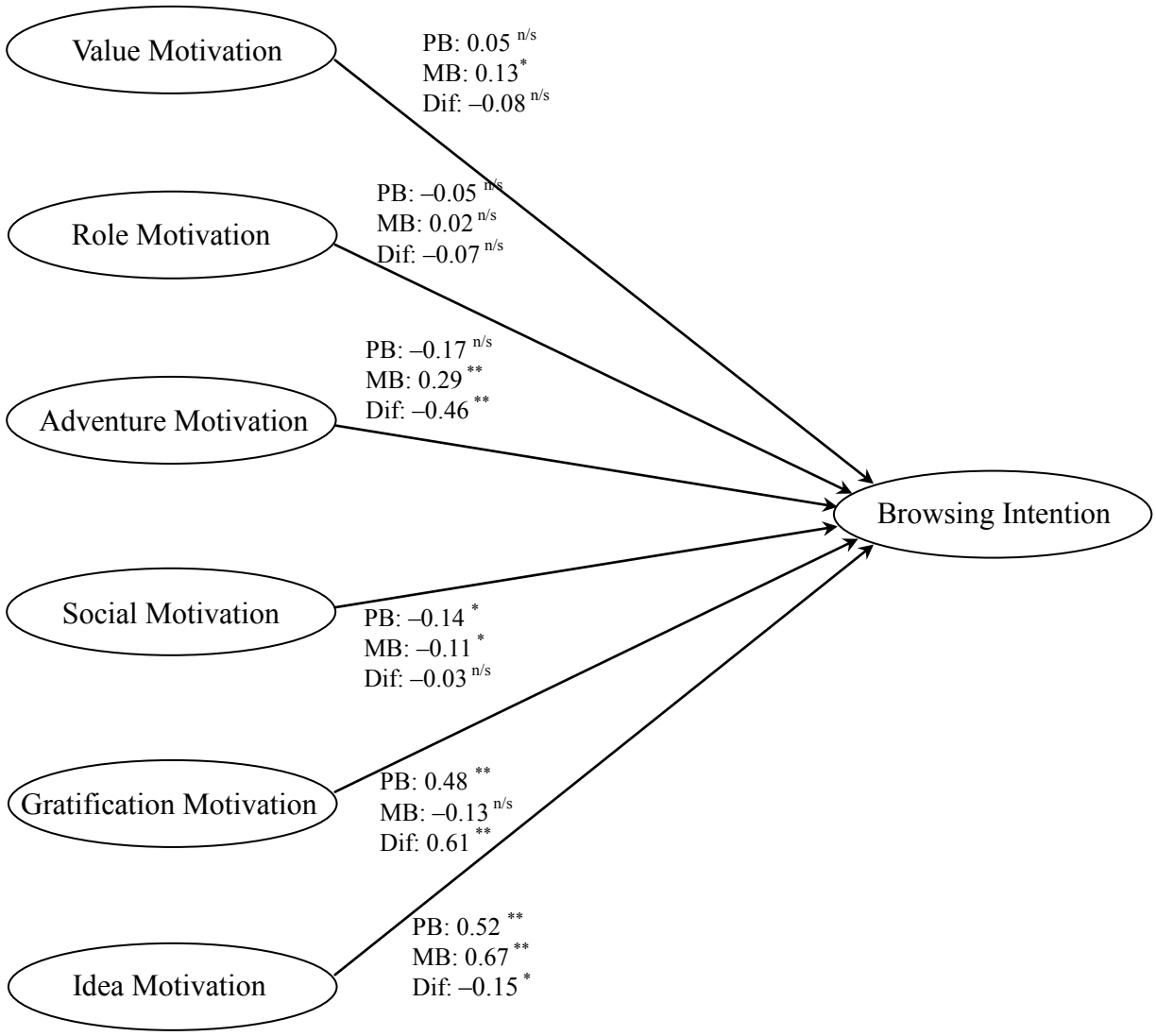

Figure 1. Consumer Motivations in Browsing Retail Stores

Notes: PB and MB mean coefficients for physical browsing and mobile browsing models, respectively. Dif means PB-MB. ** significant at 1% level. * significant at 5% level.

D.V.: Browsing intention	Path Coefficients		Differences
	(a) Physical Store Model	(b) Mobile Store Model	(a) – (b)
H_1: Value motivation	0.05 (t = 1.04) $^{n/s}$	0.13 (t = 3.01) *	–0.08 (z = –1.40) $^{n/s}$
	=> H_{1a} (+): Not supported	=> H_{1b} (+): Supported	=> H_{1c} (–): Not supported
H_2: Role motivation	–0.05 (t = –0.99) $^{n/s}$	0.02 (t = 0.50) $^{n/s}$	–0.07 (z = –1.05) $^{n/s}$
	=> H_{2a} (+): Not supported	=> H_{2b} (+): Not supported	=> H_{2c} (–): Not supported
H_3: Adventure motivation	–0.17 (t = –1.53) $^{n/s}$	0.29 (t = 3.52) **	–0.46 (z = –3.39) **
	=> H_{3a} (+): Not supported	=> H_{3b} (+): Supported	=> H_{3c} (+): Supported
H_4: Social motivation	–0.14 (t = –2.50) *	–0.11 (t = –2.30) *	–0.03 (z = –0.23) $^{n/s}$
	=> H_{4a} (+): Rejected	=> H_{4b} (+): Rejected	=> H_{4c} (+): Not supported
H_5: Gratification motivation	0.48 (t = 4.72) **	–0.13 (t = –1.54) $^{n/s}$	0.61 (z = 4.57) **
	=> H_{5a} (+): Supported	=> H_{5b} (+): Not supported	=> H_{5c} (+): Supported
H_6: Idea motivation	0.52 (t = 6.50) **	0.67 (t = 9.53) **	–0.15 (z = –1.97) *
	=> H_{6a} (+): Supported	=> H_{6b} (+): Supported	=> H_{6c} (–): Supported

Table 2. Estimation Results

Notes: ** significant at 1% level. *significant at 5% level. $\chi^2_{(148)} = 500.20$, GFI = 0.91, AGFI = 0.85, CFI = 0.96, RMSEA = 0.06 (The lower value of the 90% CI = 0.05; the upper value of the 90% CI = 0.06; PCLOSE =0.01), SRMR = 0.05, NFI = 0.94, AIC = 684.20.

The chi square value for the model was 500.20 for the overall model (252.40 and 221.15 for offline browsing and mobile-based online browsing models, respectively) and the degree of freedom was 148 for the overall model (70 for both offline browsing and mobile-based online browsing models). χ^2 / d.f. is 3.38 for the overall model (3.61 and 3.16 for offline browsing and mobile-based online browsing models, respectively), which was slightly above the recommended range of not exceeding 3.00 [10].

The goodness of fit index (GFI) was 0.91 for overall model (0.91 and 0.92 for offline browsing and mobile-based online browsing models), and the GFI adjusted by the degrees of freedom (AGFI), was 0.85 for the overall model (0.84 and 0.86 for offline browsing and mobile-based online browsing models, respectively). Both indices were higher than the recommended level of up to 0.90 and 0.80, respectively [19].

In this relatively large model with multiple population analyses, a useful index is the root mean square error of approximation (RMSEA). Browne and Cudeck [11] recommended that a value of around 0,05 or less would indicate a close fit of the model and that the value of about 0,08 or less would indicate a reasonable error of approxima-

tion and would not want to employ the model with a RMSEA greater than 0.10. The RMSEA was 0.06 for the overall model (0.09 and 0.08 for offline browsing and mobile-based online browsing models, respectively), indicating a satisfactory fit of the data to the model. Regarding the RMSEA, the lower and upper values of the 90% confidence interval for the overall model are 0.05 and 0.08, respectively (0.07 and 0.10 for offline browsing model, and 0.07 and 0.09 for mobile-based online browsing model, respectively). Both indices were lower than the recommended level of up to 0.05 and 0.08, respectively. Moreover, the width of the two values indicated the precision in the estimate of the RMSEA.

The standardized root mean square residual (SRMR) was 0.05 for the overall model (0.05 and 0.04 for offline browsing and mobile-based online browsing models, respectively), which was within the recommended range of not exceeding 0.08 [19]. The normed fit index (NFI) was 0.94 for the overall model (0.93 and 0.95 for offline browsing and mobile-based online browsing models, respectively), which was within the recommended range of 0.9 and above [16,19]. Values of these goodness-of-fit statistics also indicated a close fit of the data to the model.

Value Motivation

The results showed that H_{1a} was not supported ($\beta_{11a} = 0.05$, t = 1.04, $p > 0.50$), whereas H_{1b} was supported ($\beta_{11b} = 0.13$, t = 3.01, $p < 0.05$), suggesting that value motivation is likely to have impacts on mobile browsing, whereas it is unlikely to have impacts on offline browsing. Consumers typically have to spend more time and make more effort in order to shop around physical stores to find the lowest price, whereas they can more readily search which store offers lowest price online with mobile devices. Therefore, consumers who want to enjoy exploring discounted products prefer browsing mobile-based online stores rather than physical stores.

Note that H_{1c} was not supported ($\beta_{11a} - \beta_{11b} = -0.08$, $z = 1.40$, $p > 0.05$), suggesting that there was no significant difference between the effect of value motivation on mobile browsing and offline browsing. Thus, in total, value motivation is not crucial for consumers to browse online stores with mobile devices in addition to the real stores. It may be because browsers go shopping without an immediate intent to buy and, therefore, discounted products and sale items may possibly not be their focus.

Role Motivation

The results showed that neither H2a nor H2b was supported (β12a = −0.05, t = −0.99, p > 0.05; β12b = 0.02, t = 0.50, p > 0.05, respectively), suggesting that role motivation is unlikely to affect browsing intention. And, as a result, H2c was not supported (β12a − β12b = −0.07, z = 1.05, p > 0.05), meaning no significant difference existed between the effect of role motivation on browsing intention in online stores with mobile devices compared with those in physical stores.

Note that role motivation refers to the enjoyment that consumers acquire in the process of shopping for friends and family. Consumers who want to enjoy playing social roles may not browse stores—i.e., this type of motivation may be satisfied only by purchasing products for others.

Adventure Motivation

The results showed that H_{3a} was not supported ($\beta_{13a} = -0.17$, t = −1.53, $p > 0.05$), whereas H_{3b} was supported ($\beta_{13b} = 0.29$, t = 3.39, $p < 0.01$), suggesting that adventure motivation positively affects browsing intention only in mobile-based online stores. Also, H_{3c} was supported ($\beta_{13a} - \beta_{13b} = -0.46$, $z = -3.38$, $p < 0.01$), indicating that the effect of adventure motivation on browsing intention in online stores compared with mobile devices is higher than that in physical stores.

Consumers who want to feel a sense of adventure do not browse physical stores, but mobile-based online stores. That may be because consumers are still unfamiliar and, therefore, exited with browsing in online stores with mobile devices.

Social Motivation

The results showed that neither H_{4a} nor H_{4b} was supported ($\beta_{14a} = -0.14$, t = −2.50, $p < 0.05$; $\beta_{14b} = -0.11$, t = −2.30, $p < 0.05$, respectively). Opposite from H_{4a} and H_{4b}, negative correlations were found between social motivation and browsing intention. That may be because numerous types of services are providing for consumers. Today, consumers, who wish to communicate with their friends or family, can go to cinema or to go to dinner, for example. Thus, they do not need to browse retail stores online/offline to build and maintain the social relationship.

H_{4c} was not supported ($\beta_{14a} - \beta_{14b} = -0.03$, $z = 0.23$, $p > 0.05$). That is, no significant difference was evident between the effect of social motivation on browsing intention in online stores with mobile devices and that in physical stores. Not only offline browsing, mobile browsing do not be regarded as a tool for social communication with neighbors.

Gratification Motivation

The results showed that H5a was supported ($\beta 15a = 0.48$, $t = 4.72$, $p < 0.01$), whereas H5b was not ($\beta 15b = -0.13$, $t = -1.54$, $p > 0.05$). Gratification motivation positively influences browsing intention only in physical stores. Moreover, the results showed that H5c was supported ($\beta 15a - \beta 15b = 0.61$, $z = -4.57$, $p < 0.01$). As hypothesized, this indicates that the effect of gratification motivation on browsing intention was stronger in physical stores than in mobile-based online stores.

Consumers who want to relieve their stress are more likely to browse physical stores rather than online stores with mobile devices. In physical stores, consumers receive stimulation to the five senses, meaning they can relieve their stress and alleviate negative moods. Conversely, in online stores, consumers have to gaze intently at the display screen of their smart phones and tablet computers, meaning they can relieve less stress in mobile-based online stores.

Idea Motivation

The results showed that both H_{6a} and H_{6b} were supported ($\beta_{16a} = 0.52$, $t = 6.50$, $p < 0.01$; $\beta_{16a} = 0.67$, $t = 9.53$, $p < 0.01$, respectively) and H_{6c} was also supported ($\beta_{16a} - \beta_{16b} = -0.15$, $z = 1.97$, $p < 0.05$). As hypothesized, idea motivation positively affects the intention toward browsing both mobile-based online stores and physical stores. Moreover, the effects of idea motivation on browsing intention are stronger in physical stores compared with mobile-based online stores.

Consumers who wish to keep up with information regarding new trends tend to browse both kinds of stores. However, a preference exists for browsing online stores with mobile devices rather than physical stores. It seems that consumers regard information seeking time as the most important.

Discussion

Theoretical Implication

As mentioned in the beginning of this paper, it is becoming very common for consumers to browse online retail stores with mobile devices. However, browsing has not been studied sufficiently. Although some researchers have focused on consumer browsing activity, they have failed to provide findings regarding relationship between browsing motivations and intention. Moreover, most researchers have focused on browsing in physical stores, and not online stores. No previous research has identified consumer motivations that affect the intention toward browsing mobile-based online stores compared with physical stores.

Thus, in this study, we applied six dimensions of Arnold and Reynolds' theory of hedonic shopping motivations [2] to a model explaining the determinants of intention toward browsing retail stores. The browsing intention model was estimated with two datasets regarding consumers' browsing experiences in both physical stores and mobile-based online stores. While To, et al.'s research [39] identified only one motivation of Arnold and Reynolds' six hedonic motivations affecting consumers' intention toward searching online stores, the results of this study show that four kinds of motivations might have effects on consumers' intention toward browsing physical stores and mobile-based online stores.

Our empirical research suggested that consumers' intention toward browsing physical stores was affected positively by idea motivation and gratification motivation, while it was negatively influenced by social motivation. Note that these two kinds of motivations may be related to Bloch, et al.'s two kinds of browsing determinants [9]—information and recreation, respectively. We implied that offline browsing for information acquisition might be highly motivated by consumer desire for knowing innovative products, while offline browsing for recreation might be highly motivated by stress relief.

On the other hand, our research suggested that intention toward browsing mobile-based online stores was affected positively by idea motivation, adventure motivation, and value motivation, while it was negatively influenced by social motivation. It is implied that unlike offline browsing, mobile browsing for information acquisition might be highly motivated by consumer desire for knowing discounted products as well as innovative products. Also, unlike offline browsing, mobile browsing for recreation might be highly motivated by the feeling of exploring in a space of extraordinariness.

We did not find the effects of other three motivations, i.e., role motivation, social motivation, and gratification motivation on mobile browsing. These motivations are not satisfied by browsing the products for friends and family with mobile devices: They may be satisfied only by purchasing the actual products. Note that Reynolds, et al. [33] proposed simple hypotheses that buyers and browsers might expect different levels of value for shopping. Thus, differences between "shopping with a purchase intention" and "browsing without a purchase intention" might become an interesting research topic.

Management Implications

This study provides management implications for retailers to attract browsers to their stores. First, both offline and mobile browsers are most likely to have idea motivation—a motivation to keep up with trends and new fashions and to see new products and innovations. Our research implied that this type of browsing motivation had the highest impacts on consumers' intention toward browsing retail stores. Therefore, it is effective to carry out any strategies to attract browsers who would like to find any new products and innovations.

Physical stores should educate contact persons to provide browsers with the latest information that is not known upon many people, in order to let the browsers become satisfied that they are keeping up to the latest trends. Online stores should also focus on idea motivation. E-retailers for mobile consumers should design their mobile stores to provide information such as the new trends for the next season to browsers that most people would not know yet. Note that idea motivation has more effects on mobile browsing than offline browsing. It is important for multi-channel retailers to update web pages frequently so that customers can access and acquire the latest information whenever and wherever online.

Second, adventure motivation also has an effect on consumers' intention toward browsing mobile-based online stores. Therefore, e-retailers for mobile consumers should keep an exciting and stimulating atmosphere in their mobile-based stores. For example, retailers should provide browsers with moving images and animations that expresses the brand through the internet so that they can experience a space of extraordinariness.

Note that adventure motivation has no effects on browsing intention in physical stores. As mentioned earlier, it may be because consumers are so familiar and, therefore, unexcited with browsing in physical stores. Thus, physical stores may have to consider

the change of their store types into more attractive ones.

Third, value motivation also has an effect on browsing intention only in mobile-based online stores. It may be effective for e-retailers to provide information about discounted products in their mobile-based stores in order to attract browsers. However, value motivation is not so crucial for browsers because they go shopping without an immediate intent to buy and, therefore, discounted products and sale items may possibly not be their focus.

Finally, we did not find evidence that role motivation, social motivation, and gratification motivation are related to mobile browsing. Of these three motivations, role motivation and social motivation did not facilitate in not only mobile browsing, but also offline browsing. Role motivation is not satisfied by browsing the products for friends and family: It may be satisfied only by purchasing the products for others. Social motivation is also not satisfied by browsing the same products as those browsed by friends and family: It may be satisfied only by purchasing the same products as those purchased by others.

Gratification motivation has no effects on mobile browsing while it has a positive effect on offline browsing. Physical stores are required to provide enjoyment for helping browsers get rid of their stress by providing special experience on displayed products and/or contact persons. In contrast, online stores for mobile commerce are not expected to provide a diversion from the routine of daily life. If mobile browsing evolve from just watching the display screen of a mobile phone to, for example, experiencing augmented reality (AR), gratification motivation and the other insignificant motivations may become important in the near future.

Limitations and Future Research

This study has some limitations. First, the results showed that although most fit indices were within the recommended range, some were not. Also, we used a student sample. Thus, we need to investigate external validity of the proposed model. In this study, we measured predictor and criterion variables from the same sources. Harman's single factor test was performed and found that the effect of common method bias is not problematic. However, the remedy couldn't completely eliminate it. For future research, as a procedural remedy, predictor and criterion variables should be gathered from different sources.

Although people aged 20 to 29 is a main target of mobile commerce, it might be an

interesting topic to examine the difference in motivations toward browsing among various segments. Also, we did not consider differences among product categories. Some products may provide consumers with more enjoyment while browsing the online stores compared with other products.

Future research should also consider in-store browsing online with desktop computers. In this study, we chose only two types of browsing—browsing intention in physical stores and mobile-based online stores—because it is difficult to conduct simultaneous analysis in more than two populations with structural equation modeling. However, desktop computer browsing may be different from both mobile browsing and offline browsing. It may be, therefore, ideal to investigate the difference among the three types of browsing.

Finally, we did not model what determines each of the six hedonic motivations. Previous browsing studies have claimed that two determinants, i.e., store and consumer characteristics, affect consumer browsing [9]. Therefore, future research should consider these determinants in our browsing intention model. In particular, it might be interesting research topic to identify store characteristics determining the motivations toward browsing, which may be different between online and offline stores.

Despite these limitations, this study contributes to our knowledge of consumer motivation towards browsing online stores with mobile devices.

Acknowledgment

The authors would thank guest co-editors, Dr. George M. Giaglis and Dr. Panos E. Kourouthanassis, and three anonymous reviewers for their useful comments. The authors also would thank Tomoaki Sonoda, Yamato Sato, Takahiro Chiba, and Mao Ogino for their kind help.

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Appendix 1. Scale Items

Determinants	Scale Items (factor loading)	α	CR	AVE	MSV	ASV
ξ_1: Value Motivation	X_1 : I enjoy looking for discounts. (.81)	.91	.91	.59	.13	.08
	X_2 : I enjoy looking for bargain goods. (.93)					
	X_3 : I enjoy looking for low-priced products. (.94)					
	X_4: I enjoy finding the best product for my money. (.64)					
	X_5 : I enjoy comparing goods to find the best product for my money. (.55)					
	X_6 : I like looking around the store for sale. (.74)					
	X_7 : I like looking around the store to find discounts. (.70)					
ξ_2: Role Motivation	X_8 : I like shopping for others to make them feel good. (.90)	.94	.94	.69	.18	.09
	X_9 : I like shopping for others because when they feel good I feel good. (.93)					
	X_{10}: I enjoy shopping for my friends and family. (.93)					
	X_{11}: I enjoy shopping around to find the perfect gift for someone. (.89)					
	X_{12}: I feel good to find the perfect gift for someone. (.87)					
	X_{13}: I go shopping as a way to fulfill my responsibility to my family. (.63)					
	X_{14}: I am glad to go shopping as a way to fulfill my responsibility to my family. (.62)					
ξ_3: Adventure Motivation	X_{15}: I feel myself compelled to find products in the store. (.57)	.90	.90	.57	.52	.20
	X_{16}: I get stimuli on the shopping. (.62)					
	X_{17}: I lose my sense of time on the shopping. (.79)					
	X_{18}: I think shopping is an adventure. (.84)					
	X_{19}: I feel like I am in my own universe on the shopping. (.84)					
	X_{20}: I felt a sense of adventure on the shopping. (.82)					
	X_{21}: I was able to do a lot of fantasizing on the shopping. (.77)					
ξ_4: Social Motivation	X_{22}: I enjoy socializing with my family or friends on the shopping. (.91)	.89	.89	.64	.18	.10
	X_{23}: I extend personal relationship on the shopping. (.92)					
	X_{24}: I like exchanging information with friends on the shopping. (.77)					
	X_{25}: I like sharing experiences with others on the shopping. (.83)					
	X_{26}: I like developing friendships with other shoppers on the shopping. (.49)					
ξ_5: Gratification Motivation	X_{27}: I was able to forget my problems in the shopping. (.74)	.91	.91	.59	.52	.24
	X_{28}: I go shopping to make me feel better when I am in a down mood. (.80)					
	X_{29}: I go shopping to take away a down mood. (.90)					
	X_{30}: I think shopping is a way to relieve stress. (.86)					
	X_{31}: I feel like an escape when I look around the store. (.72)					
	X_{32}: I distracted my mind from my troubles when I go shopping. (.70)					
	X_{33}: I get so involved when I go shopping that I forget everything else. (.65)					
ξ_6: Idea Motivation	X_{34}: I enjoyed being immersed in exciting new items. (.80)	.85	.87	.58	.43	.20
	X_{35}: I go shopping to see what new products are available. (.88)					
	X_{36}: I like finding new products in the store. (.87)					
	X_{37}: I go shopping to experience new things. (.58)					
	X_{38}: I go shopping to keep up with the trends. (.64)					
η_1: Browsing Intention	X_{39}: I go shopping without intent. (.91)	.92	.93	.81	.43	.20
	X_{40}: I am primary just looking around the store. (.97)					
	X_{41}: I want to go shopping only for looking around the store. (.82)					