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경영학 석사 학위논문

# Purchaser Search Behavior in Online Shopping Mall

온라인 쇼핑몰에서 실질 구매자의 검색 행동 연구

2021 년 2 월

서울대학교 대학원

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# Purchaser Search Behavior in Online Shopping Mall


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2021 년 2 월

서울대학교 대학원  
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김현민의 경영학 석사 학위논문을 인준함  
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# Abstract

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It is known that most online shopping mall visits do not lead to purchases, which called a very low conversion rate, and companies try to find profitable customers among visitors. This study aims to identify characteristics of actual consumers visit behavior differentiated from simple visitors in online shopping malls. To this that end, 1,048,575 web log data (about 1.04 million) of online cosmetics shopping malls were analyzed based on the theory of online consumer behavior characteristics and consumer decision making theory. Referring to previous studies, search variety is manipulated based on brand and product.

The research has shown that actual buyers have lower search variety than simple visitors do. Purchasers showed a negative relationship with both product and brand search variety. It means that visitors who have strong purchase intention save search time and cost followed by goal-oriented behavior. For only brands without information, brand search variety is positive related with purchasing. In this case, search variety has positive relationship with duration time too. This can be interpreted as an impulsive purchase rather than a

planned purchase. As a result, prior research suggesting duration time has positive effect on purchasing, it can only be applied to consumers who do not have clear shopping goals.

Furthermore, it confirms that there is a difference in the behavior of removing goods from online shopping cart between the purchaser group and the simple visitor group. It is a better purchaser indicator considered the use of shopping carts and the removal of items from shopping carts at the same time, complementing the limitations of research conducted whether using shopping cart solely.

**Keyword:** actual buyer; search variety; duration time; online shopping cart

**Student Number:** 2018-26366

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# 1. Introduction

## 1.1. Study Background

E-commerce market is growing rapidly due to Internet dissemination and Information technology development in recent decades. At the same time, consumers get used to using them and become more and more clever when making purchase through online channels. For example, consumers visit online shopping site for getting information of products they are interested in, but eventually not to purchase. Economical consumers, who consider reasonable prices, wait until price of product drops (online shopping hesitation) or do cross-over shopping (browsing information online and purchase things offline). Accordingly, online shopping mall is known for low purchase conversion rates. 98% of visitors are simple visitors, leaving the sites without buying anything. Surprisingly, only less than 2% of visitors purchase products after visiting specific sites (forrester, 1999). Moe and Fader (2004) found the purchase conversion rate of general online commercial sites is lower than 5 percent. Srinivasan et al (2002) asserts, as growing online market, numerous websites are born and compete with each other's. In the meantime, consumers can easily hop to other sites and gain more information, which end up influencing the process and outcome of decision-making. Therefore, it is necessary for online corporation to identify profitable and potential consumers who is going to be an actual buyer. On this account, researchers tried to find online consumer behavior characteristics' that convert to real purchase. Online users' behaviors such as 'duration time', 'page-view', 'click stream', 'inter-visit time' and so on are closely related to site stickiness bringing profit to online companies (Buklin and Sismerio 2000; Moe and Fader 2000; Anders 1999; Hanson 2000). Subsequently then, Young Hyuck Joo and Sanmgan Han (2001) organized those behaviors 'Search Depth' and 'Search Variety'.

However, consumers use online shopping sites not just as a channel to buy things but also as a means to explore information (DMC2013). Consumers whose real purpose is to seek entertainment or information but not to shop, can visit online shopping malls as well. Hence, visitors at online shopping sites can be categorized into two types, visitors with or without purchase intention. In a similar way, Hoffman and Novak (1996) defined two types of behaviors on Internet users. One is goal-oriented behavior and the other is experiential behavior. visitors who have clear purchase intention can be expected to behave in goal-oriented way. These visitors are going to be actual buyers in the end. Meanwhile, 'experiential behavior' can be matched to non-buyer behavior characteristics in online shopping site.

As mentioned before, online shopping sites imply both 'shopping' and 'searching' spaces. Accordingly, Online shopping cart works as a means of exploration. Buyers might use online shopping cart as a tool for making consideration set. On the other side, non-buyers with the purpose of killing times, gathering information, or seeking enjoyment also use online shopping cart as a kit for on-going search. Given this fact, online shopping cart abandonment or online shopping cart hesitation is bound to happen. Online shopping cart abandonment. The concept of 'online shopping cart abandonment' can be established in respect of considering 'online shopping cart' as a role of traditional shopping basket. This interpretation is lack of full understanding of online shopping cart function and has limitation not considered as an information searching tool.

The purpose of this study is to reveal the behavioral characteristics of actual buyers in online shopping mall. This study is meaningful in respects of analyzing actual consumers' log data. And the result can be helpful to online consumer behavioral studies and identifies the behavioral characteristics of purchasers. Furthermore, the study is able to give insight related to profitable consumers (actual purchasers) behavior research and redeems online shopping cart research. Existing research about online shopping cart has focused on cart abandonment or hesitation. This study provides a better perspective and extending width of online cart research by considering all the role of online shopping carts. In practical aspect, the study can



be used for making strategy to increase the purchase conversion rate and discriminate profitable consumers.

## 1.2. Research Question

This study starts from these questions. Specific research question will be addressed in Model section as purpose of the research.

- [1] What behavioral characteristics can truly classify online shopping mall visitors into buyers and non-buyers?
- [2] What is the difference between buyers and non-buyers in using online shopping carts?

## 2. Literature Review

### 2.1. Shopping Motives

Shopping Motives refer to the consumers' needs or desire choosing a retailer to purchase particular product or service. Tauber (1972) showed shopping motivation unrelated to an actual purchase. Furthermore, Bellenger and Korgoanker (1980) found that consumers enjoy shopping itself whether or not purchase. So, Shopping Motives affect not only purchasing behavior but also general shopping behavior. Many studies have been conducted on shopping motives to understand consumers' shopping behavior.

Westbrook and Black (1985) proposed a theoretical model of shopping motivations. Shopping motivation identifies (1) anticipated utility of prospective purchases; (2) enactment of an economic shopping role; (3) negotiation to obtain price concessions from the seller; (4) optimization of merchandise choice in terms of matching shoppers' needs and desires; (5) affiliation with reference groups; (6) exercise of power and authority in marketplace exchanges; and (7) sensory stimulation from the marketplace itself. The study clearly points to the difficulty of measuring shopping motivation and motivation implies many things.

Hammond (1998) explored differences between novice and more experienced Web users although this research doesn't study directly shopping motivation. It finds prior experience is an important moderator of users' attitudes towards the web. Users' type decides hedonic shopping motives or Utilitarian shopping motives.

Hairong Li (1999) suggested a model of consumer online buying behavior. The study finds shopping orientations by online buying behavior is classified; (1) Recreational (2) Convenience (3) Experiential (4) Economic.

Several studies found that shopping Motives aren't simple. Shopping motivation is inspired motivation is inspired from various things. Not only 'Needs recognition' but also 'Seeking fun' make consumer led to purchase something.

## **2.2. Consumer Online Search Behavior**

Consumer Searching Behavior is different depending on shopping Motives. Consumer search can occur not only in purchase context but also outside of the purchase process. 'pre-purchase search' has been defined as Information seeking and processing activities which

one engages in to facilitate decision making regarding some goal object in the marketplace. (Kelly 1968, p.273). ‘Ongoing search’ indicates that searching behavior occurs on relatively regular basis, independent of sporadic purchase needs (Peter H, Daniel L and Nancy M, 1986). Pre-purchase search is motivated to enhance the quality of the purchase outcome (Punj and Stalin 1983). On the other hand, Ongoing search is triggered by getting information potentially useful in the future (Hirschman and Wallendorf 1982) or pleasure.

Hoffman and Novak (1995) suggested two types of Internet user’ s behavior while spending time in virtual space. (1) Goal-oriented behavior (2) Experiential behavior. Goal-oriented behavior can be explained by extrinsic motivation, instrumental orientation, situational involvement, utilitarian benefits, directed search. In contrast, Experiential behavior includes intrinsic motivation, ritualized orientation, enduring involvement, hedonic benefits, non-directed search.

Online shopping mall visitors are divided into a real-purchaser and a non-purchaser. Consumer who definitely wants to buy product is characterized by utilitarian shopping motives and goal-oriented behavior. It results in making real purchase. In contrast, People who connect online shopping mall for fun or getting information spend time there followed by hedonic shopping motives and on-going search behavior.

## **2.3. Goal-Directed Behavior**

Hoffman and Novak (1996) organized the distinction between goal-oriented behavior and experiential behavior for World Wide Web, as termed a ‘Computer-Mediated Environment (CME)’ . Bloch, Sherrel, and Ridgway (1985, p121) pointed that for choice, in experiential behavior, “activities are not guided by goals or

outcomes, but by the process itself” . In contrast, consumer choice in goal-directed behavior is based on a clearly definable goal hierarchy, and movement through this goal hierarchy involves choice among products and services, information sources, and navigational alternatives. In other words, Consumer who makes decision based on goal-directed behavior use as little effort as necessary to solve a problem (Payne, Bettman and Johnson 1993, p.13). Goal-directed behavior pursues to avoid duration of time and spending cost. Especially, Duration time is a critical outcome measure of experiential behavior (Holbrook and Gardner 1993).

## **2.4. Visitors Behavior Characteristics**

Many empirical studies suggests that duration time, page views and frequency of visits are meaningful variables which works as a classification of customers. Those variables are considered all together in these days to classify specific customer group, especially, reveal profitable customer behavior. Bucklin and Sismeiro (2000) argued that Website stickiness is made of individual customer' s duration time and page view. this study focuses on finding impactors on Website Stickiness because this stickiness contributes profit of online shopping mall. Based on these notion, Young Hyuck Joo and Sanmgan Han (2001) arranged online site visitors behavior characteristics variables. The authors specified 'Depth of search' and 'Variety of Search' . Depth of search indicates exploring information at the lowest level within the website. For example, Johnson et al (2000) defined depth of search as the frequency of visit more than once for each product category within website. Specifically, it measured in three product categories (Books, CDs, Travel Agencies) over specific period (1 month). Variety of search was measured by how diverse menu was explored within sites.

## 2.5. The effect of Brand on Consumer Behavior

To the consumer on Main street, the terms “product” and “brand” are often used interchangeably. A Product is “something that offers a functional benefit” (Farquhar 1989, p.24). A brand, on the other hand, is “a name, symbol, design, or mark that enhances the value of a product beyond its functional value” (Farquhar 1989, p.24). Brand is important role for consumer buying products. Brand awareness affects consumers’ purchase intention (Mi Ae Go and Ji Yeon Kim, 2015). In other words, Consumer is unlikely to purchase the product with low brand recognition, bad reputation brand. Accordingly, Consumers buy products because they like certain brands.

## 2.6. Online Shopping Cart

Online Shopping cart is a feature provided by online shopping mall. It is a virtual space helping customers to put or remove products as they want before purchasing (Tae Hoon Ha, 2015). Kukar-Kinney and Angeline G (2010) explored which factors influence shopping cart abandonment based on online buyer behavior theory. The authors define ‘shopping cart abandonment’ as consumers’ placement of item(s) in their online shopping cart without making a purchase of any item(s) during that online shopping session. To summarize all the findings, the use of online shopping carts (put items into shopping cart) occurs in both goal-oriented and experiential behavior. Consumers use online shopping cart as a tool of storing purchase consideration set, at the same time, a kit for gathering information. Cart abandonment' is established in traditional context when the role of online shopping cart regarded as same as off-line shopping basket. However, there might be difference between buyer and non-buyer behavior in using online shopping cart. If we consider consumer buying process, putting items into shopping cart can be matched to

Information search stage. At the same time, removing items from the cart might be explained to evaluation of alternatives. ‘Removing items from cart’ behavior indicates eliminating consideration set. In other words, it means if consumer remove something form the cart, he/she evaluates alternatives which he/she put into online shopping cart earlier. Therefore, ‘Remove from cart’ behavior is closer to real purchase than just use of cart (put items into cart).

### 3. Model

#### 3.1. Purpose of the research

The purposes of this research are demonstrated as follows. First, it finds out the difference of behavior characteristics between buyers and non-buyers of online shopping mall based on empirical research. Second, it identifies ‘Search Variety’ behavior as a meaningful indicator to discriminate purchase status based on Goal-Oriented Behavior Theory. Last, it suggests that ‘Removing from the car’ has a more significant relationship to buyers’ behavior than ‘using the cart’ following Customer Decision-making Process.

#### 3.2. Data

This study used Cosmetics Category Data from RESS46 Technologies (<https://rees46.com>) that provides marketing advice to online store owners with the intelligence and technology. The visitors’ behavior is recorded chronologically and contains users’ information such as anonymous unique ID, session ID, activity records (view, cart, remove form cart, purchase) and product information (price, category

ID, product ID, Brand). The data had been collected for a month from October 1st to October 31, 2019.

### (1) Visitors' Information

The data recorded unique user ID and session ID chronologically in order to identify the timing and period of a specific user accessing to a product on shopping site.

### (2) Visitors' Behavior

This study focused on visitors' behavior that can be simply observed when visitors are browsing websites. 'View' is recorded when a visitor views the product page. If they put a product into the cart, the data recorded 'Cart. 'Remove form cart' means a user removes an item from the cart. Lastly, 'Purchase' indicates the consumer buys the product.

### (3) Product Information

The product that the visitor made event records as 'Product ID' , which is a unique product number to indicate each product. 'Category ID' shows which category the product is. The brand of the product which visitor viewed, putted into cart, removed from cart or purchased is recorded as 'Brand' . Price of the product in the session shows 'Price' . (The data also include category code, however, all of them came from the Cosmetics category. Therefore, the category code is empty.)

Table1. Online Cosmetics shopping mall data

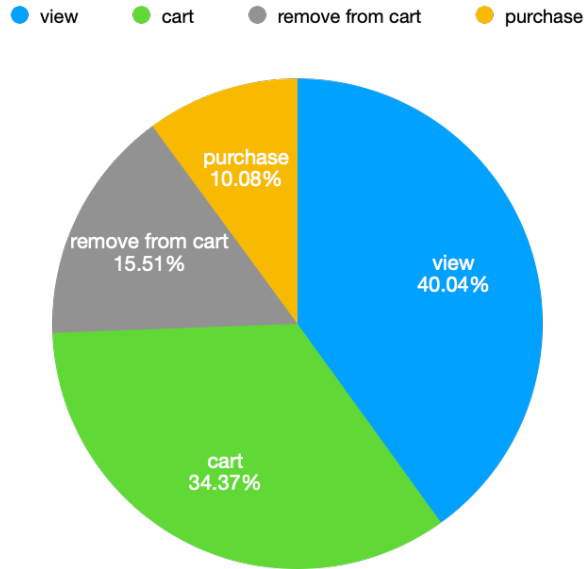
Variables	Interpretation	Example
Event_time	event occurred time, date	2019-10-07 19:35:37 UTC
Event_type	visitors' behavior	view, cart, remove form cart, purchase
User_id	unique id of user	437891561
User_session	unique session id generated by the visit	000027d7-5077-4a81-89de-ce2c4936a28f
Product_id	product number which event occurred	5646845
Category_id	category number where product comes from	14875800000000000000
Brand	Product Brand	irisk
Price	Price of Product	50

Table 2. Data Summary

Users	Users by session	Brand	Purchase
1,048,575	222,037	175	55,675



Figure 1. Event type summary



### 3.3. Data Processing

#### (1) No brand information

There are brands without information in data, in other words, the record of “Brand” is empty. According to the REES46, blanked brand data means that a product is not produced from a famous or well-known brand. Product purchased from non-official channels such as flea market or street vendor might be a suitable example for brand without information. In this study, brands are separated into two types.

“Brand” and “No-Brand (brands without information)” . Therefore, A brand without information is counted as a ‘No-brand’

#### (2) Sampling variables from data for research purpose

By referring other research, setting the basis of the interpretation behavior in data (Tae Hoon Ha, 2015) is followed.

- 1) The users' action(behavior) is completed with the purchase of the product.
- 2) If there is no purchase record in the session, the session is considered as a consumer do not buy anything.
- 3) Users may or may not use online shopping carts during the session.
- 4) Users may or may not remove items from cart during the session.

In the case of the online shopping cart, for the purpose of accuracy, strict rules are highly necessary when proposing the hypothesis due to that there are some situations resulting in bias to the results. For instance, users might put items into the cart before the session started and remove them from the cart later session. In this case, the effect of 'Remove from cart' might be overestimated. Therefore, rigorous setting for 'Remove from cart' must be added and followed.

- 5) 'Remove from cart' and 'Cart' should occur simultaneously in the session.
- 6) 'Remove from cart' behavior cannot occur more than 'Cart' .

### 3.4. Variables Measurement in Data

#### Search Variety

Search variety is created based on 'Variety of search' (Young Hyuck Joo and Sang Man Han, 2001). Search variety indicates individual characteristics on browsing information. In other words, high search variety means that the person would search a lot more brands or products than he/she is willing to buy. search variety will be measured in aspects of brands and products.

### (1) Brand Search Variety

Brand search variety is divided into 'known brand search variety' and 'brand with no information search variety'. This brand search variety is calculated by the number of purchased brands subtracted from the sum of all brands that were recorded during the session including page-view, usage of cart, removing from cart, purchase in a session.

### (2) Product Search Variety

Product search variety is also measured in the same way by calculating the number of purchased products subtracted from the sum of all products that were recorded during the session including page-view, usage of cart, removing from cart, purchase in a session.

Following are the notions of online consumer behavior and data built up for the study

Table 3. Variables from Data for the study

Variables	Variable from data	measurement
	Brand Variety	The number of purchased brands subtracted from all brands including page-view, usage of cart, removing from cart, purchase in a session * Only for brands with names
	No-Brand Variety	Same as Brand search variety * Only for brand with no

Dependent variable		information
	Product Variety	The number of purchased products subtracted from all different product ID including page-view, usage of cart, removing form cart, purchase in a session
Independent variable	Purchase	Whether consumer purchase or not in a session
Control variable	View	The number of times page-view in a session
	Duration Time	The period from the start to the end point of a session
	Cart	whether consumer use or not cart in a session
	Remove from Cart	consumer use cart and remove from cart at the same time in a session

\* when one search variety is examined as a dependent variable, the other search variety will be control variable.

Basically, the same data is used to check removing from cart works as a better indicator differentiating buyer and non-buyer. variables are a little bit changed. Dependent variable is going to be 'Purchase' while control variable is 'Search variety variables' . Until now, existing studies have checked the impact of 'Whether using cart' for purchase' . As mentioned before, online shopping cart is used as 'a shopping basket' and 'a searching tool' . Therefore, 'usage of cart' may not be a proper indicator for checking purchases. This study is planned to confirm that considering 'remove items from cart' behavior at the same time be the better indicator for purchasing behavior. Moreover, the study is expected to find out which model

better describes ‘Purchase’ by differentiating independent variables, ‘usage of cart’ and ‘using cart and removing items from cart.’

Table 4. Variables for ‘Online Shopping Cart’

Variables	Variable from data	measurement
Dependent variable	Purchase	Whether consumer purchase or not in a session
Independent variable	Cart	whether consumer use or not cart in a session
	Remove from Cart	consumer use cart and remove from cart at the same time in a session
Control variable	View	The number of times page-view in a session
	Duration Time	The period from the start to the end point of a session
	Brand Variety	The number of purchased brands subtracted from all brands including page-view, usage of cart, removing from cart, purchase in a session * Only for brands with names
	No-Brand Variety	Same as Brand search variety * Only for brand with no information
	Product Variety	The number of purchased products subtracted from all different product ID including page-view, usage of cart,

		removing form cart, purchase in a session
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### 3.5. Model Setup

It needs to examine the impact of brand information on duration time before confirming the H1. Holbrook and Gardner (1993) argued duration time is a critical outcome measure of experiential behavior since duration time might have an interaction effect with search variety. In addition, brand awareness is influential to purchase, thus, it is necessary to check the interaction effect between brands. [1] is for checking the relationship between duration time and, especially, no-brand search variety.

$$[1] \text{ Duration time}_i = \beta_0 + \beta_1 \text{Brand Variety} + \beta_2 \text{No-Brand Variety} + \beta_3 \text{Brand:No-Brand Variety} + \beta_4 \text{Product Variety}$$

**H1: Purchase is negatively relative to Search Variety**

As discussed before, search variety can be measured based on brand and product. Brand is divided into ‘known brand’ and ‘having no information brand’. Therefore, H1 is embodied three hypotheses.

**H1-1: Purchase is negatively relative to Brand Search Variety**

$$[2] \text{ Brand Variety}_i = \beta_0 + \beta_1 \text{purchase} + \beta_2 \text{View} + \beta_3 \text{Remove from cart} + \beta_4 \text{Duration time} + \beta_5 \text{No-brand variety} + \beta_6 \text{Product variety}$$

Buyers whose behavior was characterized as goal-oriented behavior have the tendency of trying to put less effort and escape wasting time. Accordingly, it is expected that such purchasers put less time and effort in searching information, namely, an actual buyer has low ‘search variety’. In short, the purchase behavior has negative relationship with brand search variety. However, when there is no brand information, visitors need to spend more time browsing sites.

Furthermore, referring Holbrook and Gardner (1993), a purchaser who chooses a brand without information might be an impulse buyer. In accordance with the above reasons, it is rational to conclude that purchase and no-brand search variety have positive relationship.

### **H1-2: Purchase is positively relative to No-Brand Search Variety**

$$[3] \text{ No-Brand Variety}_i = \beta_0 + \beta_1 \text{purchase} + \beta_2 \text{View} + \beta_3 \text{Remove from cart} + \beta_4 \text{Duration time} + \beta_5 \text{Brand variety} + \beta_6 \text{Product variety}$$

Product Variety is measured in the same way as estimating Brand Variety.

### **H1-3: Real Purchaser negatively relative to product search variety**

$$[4] \text{ Product Variety}_i = \beta_0 + \beta_1 \text{purchase} + \beta_2 \text{View} + \beta_3 \text{Remove from cart} + \beta_4 \text{Duration time} + \beta_5 \text{Brand variety} + \beta_6 \text{No-brand variety}$$

It has been confirmed that both buyers and non-buyers use an online shopping cart. This fact indicated that consumers use online shopping carts as searching tools. There are 5 stages when consumers make decisions according to ‘consumer making decision process’ . ‘Problem recognition’ , ‘Information search’ , ‘Alternative evaluation’ , ‘Purchase decision’ and ‘Post-purchase decision evaluation’ . In this context, the usage of cart may be identical to the information search stage. The behavior of ‘removing items from the cart’ is eliminating consideration set. this behavior can be interpreted as an evaluation of alternative stage. Therefore, ‘removing items from the cart’ is a further step in consumer decision-making process, which can be seen as closer to buying.

### **H2-1: Buyers and Non-buyers have difference in ‘Remove from the cart’**

### **H2-2: ‘Remove from cart’ is a better indicator to predict purchase behavior than ‘Cart’ is.**

A comprehensive model is built including search variety.

$$[5] \text{ Purchase}_i = \beta_0 + (\beta_1 + \beta_2 \text{Brand Variety} + \beta_3 \text{No Brand Variety} + \beta_4 \text{Product Variety}) * \text{Duration time} + \beta_5 \text{View} + \beta_6 \text{Cart}$$

$$[6] \text{ Purchase}_i = \beta_0 + (\beta_1 + \beta_2 \text{Brand Variety} + \beta_3 \text{No Brand Variety} + \beta_4 \text{Product Variety}) * \text{Duration time} + \beta_5 \text{View} + \beta_6 \text{Remove from cart}$$

[5] is using ‘cart’ model and [6] is considering ‘remove from cart’ model. It will be checked by comparing [5] and [6], The model considering ‘Remove from cart’ works as a better indicator to capture purchase behavior than ordinary using cart model.

## 4. Results

Table 5 shows the result of [1]. The coefficient of ‘No-Brand Variety’ is remarkably much bigger than others’ variety. It means the high value of no-brand variety results in a longer duration time. At the same time, it confirms that brand and no-brand variety have interaction effect on duration time.

Table 5. Duration time and Search variety interaction effect

	Brand Variety	No-Brand Variety	Brand: No-Brand Variety	Product variety
coef	103.0857***	933.2924***	-6.6222***	304.2211***



## 4.1. Search Variety

The results of this analysis support all search variety hypothesis. In detail, the results suggest ‘Purchase’ has a negative coefficient on ‘Brand Variety’ and ‘Product Variety’, while ‘No-brand variety’ has a positive relationship with ‘Purchase’. It can be interpreted as actual buyers put less effort into searching various brands and products in the shopping process. These searching behaviors is consistent with goal-oriented behavior. However, if a consumer buys no-brand products, he/she would tend to browse more other goods before making his/her purchase. Furthermore, the coefficient of duration time is also positive in this case as well. It can be concluded that a no-brand product buyer spends longer time surfing the site. Such behavior is one of the consumer behavior characteristics of those who do not have strong purchase intention or a certain purpose of buying. Therefore, in this case, a consumer who has bought the product without any brand information provided might be an impulse buyer.

Table 6. Search Variety and Purchase

Model	[2] Brand Variety	[3] No-brand Variety	[4] Product Variety
	coef	coef	coef
purchase	-5.450***	1.499***	-1.461***
view	6.285***	5.192***	3.494***
remove from cart	5.504***	4.645	3.056***
duration time	-3.594	1.368***	3.322***
brand variety		7.030***	6.371***

no-brand variety	5.586***		1.032***
product variety	5.850***	1.193***	
R-squared	0.7783366	0.6921997	0.8336417
Adj.R	0.7783306	0.6921914	0.8336372

## 4.2. Online Shopping Cart

ANOVA (Analysis of variance) is used to check the differences of ‘remove from cart’ behavior between the two groups (buyers and non-buyers).

Table 7. ANOVA ‘remove from cart’

	SS	DF	MS	F-value	P-value
Purchase	168535	1	168535	4647.7	<2.2e-16 ***
Residuals	8051389	222035	36		

Table 7 shows that there is a significant difference in ‘remove from cart’ behavior between the purchasing and non-purchasing groups. ( $P < 0.05$ ) Therefore, H2-1 is identified and ‘remove from cart’ behavior can be suggested as a meaning variable to discriminate buyers among online shopping visitors.

Table 8. Comprehensive Model Comparison

Model	[5]	[6]
	coef	coef
view	-1.917***	5.038*
cart	1.805	
remove from cart		2.919***
brand search variety	-2.088***	-7.811**
no-brand search variety	3.257***	2.482***
product variety	-2.224***	-4.731***
duration time	5.377***	1.259**
brand search variety: duration time	5.136*	2.807
no brand variety: duration time	-8.895***	-6.645***
product variety: duration time	8.094***	1.480***
R-squared	0.1088653	0.1619127
Adj.R	0.1088292	0.1618787

Table 8 is the summary of all the results and the following are the main findings of this analysis. First, ‘whether using cart’ variable is not significant to explain ‘purchase’ in the research. In meanwhile, considering ‘remove from cart behavior’ variable together, its coefficient is positive and significant to ‘purchase’. The result is consistent with existing studies on the impact of using shopping carts on purchases. On those studies, the significance of the effect has been shown inconsistent results although the impact of shopping cart usage on purchases is generally positive. As a result, ‘usage of cart’ may not be an effective indicator to predict purchase behavior. This proves that ‘online shopping cart’ is not identical to ‘offline cart. Therefore, it is not surprising that the effect of cart

usage on purchase in ordinary studies to be inconsistent. That is because those studies approached ‘online shopping cart’ in terms of traditional shopping cart and did not consider the perceptual differences of the users. As mentioned before, it is important to regard an online shopping cart not only as a traditional shopping basket but also as a browsing kit. If an online shopping cart was used as a searching tool by a consumer in the decision-making process, it can be interpreted that a consumer is on the information searching stage. In this context, ‘removing items from cart’ is indicative action that a consumer has made his/her own evaluation of other alternatives. This behavior is much closer process to the purchase stage. On this account, considering both cart usage and “remove from cart” behavior together works as a better indicator to explain purchase comparing solely using ‘cart usage’ .

## 5. Conclusion

### 5.1. Discussion

The analyzed results of sampling data support all the hypotheses. First of all, it is suggested consumers who have strong and specific purchase intention have lower search variety at the online shopping site. In short, purchasers who have needs to buy specific products tend to spend less time on browsing the site since they visit the shopping site with a clear goal or plan. Thus, their behavior pattern fits into ‘goal-oriented behavior’ theory. They try to escape from time waste and unnecessary costs. Therefore, they are unwilling to search exceeding various products or brands. Unlike them, there are also buyers who made unplanned purchase. Someone who visits online shopping sites without purpose and enjoy the process. Such visitors stay longer time and search broadly, ending up unplanned buying. This type of consumers’ behavior patterns is classified as an experiential

behavior. If the consumers made such unplanned purchases, it can be regarded as impulse buying. Plus, the results suggested that duration time has positive effects on purchase overall. Whereas Comprehensive results indicate that search variety and duration time are negatively indicated. For aspects of search variety, product variety could not be examined specifically, while brand variety was divided in detail. Therefore, the results of brand variety on duration time can be more precise compared to product variety. In conclusion, the longer duration time leads to purchase basically. To be more specific, longer duration time has positive relationship with impulse buying and negative relationship with planned purchase.

The second outcome related to shopping cart usage behavior is obvious. It probably happens removing items from cart after cart usage when a consumer willing to buy a product put several items into shopping cart. In other words, purchaser has high possibility of removing items from the cart, compared to, information gatherer. So far, the majority of studies on online shopping cart research has not separated 'cart usage' and 'remove from cart' behavior. Table 8 shows that 'cart usage' is a lack of significant relationship with purchase. The outcome indicates that it might be better to regard an online shopping cart regarded as a tool for gathering information rather than a predictor of purchase intention. Although the result cannot be generalized, the study demonstrated that using an online shopping cart is a behavior of exploring information. As a result, regarding cart usage as an indicator of purchase is not appropriate. Interestingly, the result of search variety and purchase relationship is consistent even though dependent variables and independent variables are altered in H2. It provides that search variety can be an extremely useful variable on online consumer behavioral characteristics research.

## 5.2. Managerial Implications

This research has practical implications for online retailers. The findings identify actual buyers tend to put less effort into searching for information. Therefore, online shopping sites should be designed for actual buyers friendly, ‘easy to find product or brand information’ , ‘pop up frequently announcing promotion information’ and ‘being able to banner clearly’ near products. For instance, it is better to subdivide product categories in detail so that consumers could find the products they want more easily within each category. Moreover, categories can be presented in multiple ways, such as usages, product lines, colors, price range etc. it might be helpful cooperating with artificial intelligence or big data as well. In addition, it is confirmed that products which have insufficient information make consumers stay longer at shopping sites. at the same time, it increases the possibility of making consumers purchase a product. Online shopping mall needs marketing strategy aimed to such hidden consumers. Longer duration time definitely draws out consumers’ unplanned purchases.

The findings that usage of cart and removing items from cart in the session have positive effect on purchases. This fact gives insight to online shopping sites. If ‘cart usage’ and ‘remove from cart’ are occurred in the session, the shopping site tries to drag the session user and make the consumer spend more time on the site. for instance, noticing price promotion or other recommendation banner based on personal preference. Since duration time is significantly effective to lead consumers to make purchases in general. Hence, online shopping mall should make an marketing strategy which is attractive to consumers so that increases duration time.

### **5.3. Limitations and Future Research**

While contributing some insights, this study has some limitations. First, the sample consists of only consumers from

European consumers and solely collected from single online shopping site; Future studies can examine other populations to determine the generalizability of findings to different countries. Furthermore, the data only covered the consumer behavior on cosmetics category products. Hence, further examination can be applied to various contexts. Second, the research does not consider price, while in general, consumers are sensitive to price. It might be valuable that reflecting price by limiting brands or products and organizing data. Last, this research lacks consumer demographics and self-reported surveys. A researcher could also combine demographic information with the study such as an investigation of search variety or using shopping cart behavior.

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## 국문초록

### 온라인 쇼핑몰에서 실질 구매자의 검색 행동 연구

오늘날 온라인 쇼핑몰 방문자는 매우 낮은 구매전환율을 보이며 이에 따라 기업은 수익성 있는 고객을 구분해내는 데 초점을 맞추고 있다. 본 연구는 온라인 쇼핑몰에서 단순 방문자와 구분되는 실질 구매자의 방문 행동 특성을 밝혀내고자 하였다. 이를 위해 온라인 화장품 쇼핑몰의 웹 로그 데이터 1,048,575(약 104 만)건을 온라인 소비자의 행동적 특성 이론과 소비자 의사결정 이론에 기반하여 분석하였다. 선행 연구를 참고하여 검색 다양성(search variety)을 브랜드(brand)와 제품(product) 기반으로 조작하여 새로운 연구 변수를 생성하였다.

연구 결과 실질 구매자는 단순 방문자보다 낮은 검색 다양성을 보였다. 실질 구매자는 제품 검색 다양성, 브랜드 검색 다양성과 모두 부(-)의 상관관계를 보였다. 이는 구매 목적을 지닌 소비자의 경우 목표 지향적 행동에 따라 검색 시간과 비용을 절약하는 행동을 보이는 것으로 해석될 수 있다. 정보가 없는 브랜드에 한하여 실질 구매자의 브랜드 검색 다양성이 정(+)을 보였다. 이 경우 검색 다양성이 체류시간(duration time)과도 정(+)의 상관관계를 나타냈다. 이는 브랜드 구매 의사를 확실하게 지닌 소비자의 계획된 구매라기보단 충동적 구매로 해석될 수 있다. 소비자의 체류시간이 길수록 구매 여부에 정(+) 관계를 갖는다는 기존 연구결과는 ‘뚜렷한 목표 없이 사이트에 접속한 소비자’의 경우에 한하여 적용될 수 있음을 시사하였다.

나아가 구매 집단과 단순 방문자 집단은 쇼핑 카트에서 물건을 제거하는 행위에 차이가 있음을 확인하였다. 쇼핑 카트 이용과 쇼핑 카트에 담은 물건 제거 행위를 동시에 고려하는 것이 구매자를 판별하는 더 좋은 지표가 됨을 밝혀내며 쇼핑 카트 이용 여부만으로 이루어진 기존 연구의 한계를 보완하였다.

Keywords : 실질 구매자, 검색 다양성, 체류 시간, 온라인 쇼핑 카트

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