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The Influence of Purchase Purpose and Customer Loyalty on Purchase Behavior in Fashion Stores

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ABSTRACT

With the rise of the e-commerce market and the spread of COVID-19, the role of actual stores such as department stores and shopping centers is changing significantly. In the context where the value of the experience in the actual store is emphasized, it is necessary to improve the comfort of shopping in the store in order to respond to the attributes and purposes of consumers and to improve the value of the experience in the store as a whole, especially in a business category in which many stores are concentrated, such as department stores and shopping centers. In this study, we conduct experiments on consumers' migratory behavior in department stores, and propose marketing measures that are unique to actual stores in accordance with consumer behavior, using data on store traffic lines and questionnaire data. Specifically, we use an eye tracking device to collect a series of data on the consumer's flow from entering to leaving a store. From the collected data, we attempt to evaluate consumers' migratory behavior from the viewpoint of purchase purpose and loyalty by using Social Network Analysis (SNA) method.

Keywords: Consumer behavior, Social network analysis, Fashion department store

INTRODUCTION

With the rise of the e-commerce market and the spread of COVID-19, the role of physical stores such as department stores and shopping centers have changed significantly. In contrast to the traditional model in which consumers recognize products through TV commercials, websites, and SNS and use physical stores as the final point of purchase, recent years have seen a shift to physical stores as a place for brand recognition and product experience. In the midst of this growing trend, concepts such as "retail entertainment" and "showrooming" have come into the limelight (Dentsu Digital Inc., 2021). Retail entertainment is a coined word that combines the words "retail" and "entertainment," and refers to the provision of value in the form of "experiences that can only be obtained in that store" as a need that appeals to consumers in a physical store. This is expected to bring enjoyment and encounter, foster customer loyalty, and increase Life Time Value (XYMAX

Corporation, 2021). Showrooming refers to a style of purchasing in which a customer actually checks out a product in a physical store and then purchases it in an e-commerce store. This is expected to be beneficial for both parties: stores can reduce their inventory burden and maximize their sales floor space, and consumers do not need to take products home. In this context where the value of the experience in the actual store is important, it is necessary to improve the comfort of shopping in the store, especially in business categories where many stores are concentrated, such as department stores and shopping centers, in order to respond to the attributes and purposes of consumers and improve the value of the experience of the entire store.

Under these circumstances, studies focusing on purchasing behavior in actual stores have been conducted. Nagai et al. conducted a study on migratory behavior in an urban outlet mall as a target of a commercial complex (Nagai et al., 2016). They used GPS technology to examine the relationship between migratory behavior characteristics, such as distance traveled, range of behavior, and tendency to visit, and shopping behavior. They found that neither purchase amounts nor unplanned purchases were significantly correlated with the length of the shopping route, but that there was a significant negative correlation between the length of the route and the intention to reuse. It remains an issue to verify the specific behavioral characteristics of consumers in consideration of the shape of the mall and the relationship between stores.

Shiozaki et al. conducted a simulation of migratory behavior in two station-front commercial clusters and one shopping center, and proposed a specific store layout by analyzing factors that influence migratory behavior (Shiozaki et al., 2021). As a result, it was shown that applying the flow line theory of shopping centers, placing popular stores at the edges and gathering stores of the same industry in each area are effective in promoting the circulation of customers. This is one of the few cases in which specific marketing measures are studied on a simulation basis based on the evaluation of migratory behavior.

Shimizu points out the necessity of considering the relationship between actual stores and consumers through a comprehensive review of flow line studies, and attempts to elucidate the factors that explain the length of flow line (Shimizu, 2020). Specifically, he conducted a flow line survey in a supermarket to investigate the factors explaining flow line length by examining the influence of the relationship between consumers and stores on flow line length. The results showed that there were differences in purchase amount per visit, number of items purchased, time spent in the store, and flow line length between loyal customers and other, with loyal customers spending less money and having a shorter flow line length. This study is significant because it was the first to add the concept of the relationship between the subject store and the subjects in a traffic line survey study.

Based on these previous studies, this study compares and evaluates the migratory behavior of consumers in a large department store with multiple floors, starting with the presence or absence of a purchase purpose, and then, as an indicator of loyalty, the presence or absence of a favorite store, and examines the importance of each store and the relationship between stores. Based

on the suggestions obtained from the analysis and discussion, we propose a specific store layout.

Experiments on Flow Line Observation

In this study, we conducted the traffics line observation experiment in a large multi-story department store located in the center of Tokyo. Specifically, we conducted the experiment over three days on October 4, 5, and 8, 2022, using eye tracking devices to observe subjects' viewpoints and extract traffic line data. The department store in which the experiment was conducted consists of 11 floors from B2F to 8F, where tenants of various categories, including fashion, general merchandise, and food stores, are gathered. Since the 7th and 8Fs are restaurant floors, they were excluded from this experiment, which focused on the subjects' migratory behavior, and the floors from B2F to B6F were used for analysis. Table 1 shows a list of the product categories offered in the stores on the target floors.

Dataset

In this study, we extracted data on subjects' traffic line data between stores in a department store from the recorded data collected by an eye tracking device. We analyze the acquired data using a Social Network Analysis(SNA) framework. SNA is a mathematical analysis of the social structure of any social unit (actor), such as an individual, company, or country (Suzuki, 2018). It is an analytical method that aims to elucidate the occurrence of social events involving actors by using graphs that represent the relationships between elements by means of nodes and edges.

We created a node list representing the stores where they stayed and an edge list representing their movement lines between stores. The stores where the subjects visited are represented as a node list consisting of store IDs, store names, and store floors (Table 2).

Table 1. List of product categories.

Product Categories			
fashion	women's fashion	men's fashion	shoes
women's shoes	bag	accessory	glass
hat	watch	innerwear	lingerie
socks	suit	kimono	contact
wig	sundries	cosmetics	perfume
art supplies	sweets	ticket	event space

Table 2. Example of node list.

Store ID	Store Name	Floor
1F_01	Store A	1F
1F_02	Store B	1F
1F_03	Store C	1F

The subject's movement between stores is represented as an edge list, consisting of the store ID before the move (from) and the store ID at the destination (to). The number of moves is given as a weight for each from-to record that represents a move between stores (Table 3).

In this study, we conduct Social Network Analysis (SNA) using these node and edge lists.

Result and Discussion

A total of 63 subjects, 32 female and 31 male, participated in the experiment, and data were collected on 38 of them. Of the 36 valid subject pairs used in the analysis, 13 were alone, 9 were female-male pairs, 8 were male-male pairs, 5 were male-female pairs, and one pair consisted of one female and two males, for a total of three participants. On the day of the experiment, we asked participants whether or not they intended to make purchases and whether or not they had a favorite store in the building. We compared the network graphs according to the presence or absence of a purchase purpose and the presence or absence of a favorite store. Specifically, we use degree centrality (*Eq*. 1) and betweenness centrality (*Eq*. 2) to reveal the differences between their respective structures (M. E. Newman, 2004), (Shinoda et al, 2008).

$$C_d(i) = C_{\mathrm{id}}(i) + C_{\mathrm{od}}(i) = \sum_{j=1}^{n} a_{\mathrm{ji}} + \sum_{j=1}^{n} a_{\mathrm{ij}} \tag{1}$$

$$C_d(v) = \frac{1}{(n-1)(n-2)} \sum_{v \neq j \neq k} \frac{g_{\mathrm{jk}}(v)}{g_{\mathrm{jk}}} \tag{2}$$

From these result, we evaluate consumers' migratory behavior.

First, we compared the network graphs by the presence or absence of a purchasing objective. A summary of the networks is shown in Table 4. We show the network graphs based on degree centrality in Figures 1 and 2, and the network graphs based on betweenness centrality in Figures 3 and 4.

From Figures 1 and 2, a network comparison of degree centrality in the presence and absence of purchasing purposes, we infer the following.

- Node size with purpose is larger overall, whereas node size without purpose is smaller overall.
- With a purpose, the node size is particularly large for stores on the 2F, such as accessories MM (2F, accessories) and fashion FS (2F, women's and men's), while without a purpose, the node size is particularly large for

Table 3. Example of edge list.

From	To	Weight
1F_01	1F_02	1
1F_02	1F_03	1
1F_03	1F_04	1

Table 4. Overview of network graphs - whether or not the purpose of purchase.

Group	Number of subjects	Number of nodes	Average number of moves
purchasing purpose	15	63	12.9
no purchasing purpose	23	84	14.6

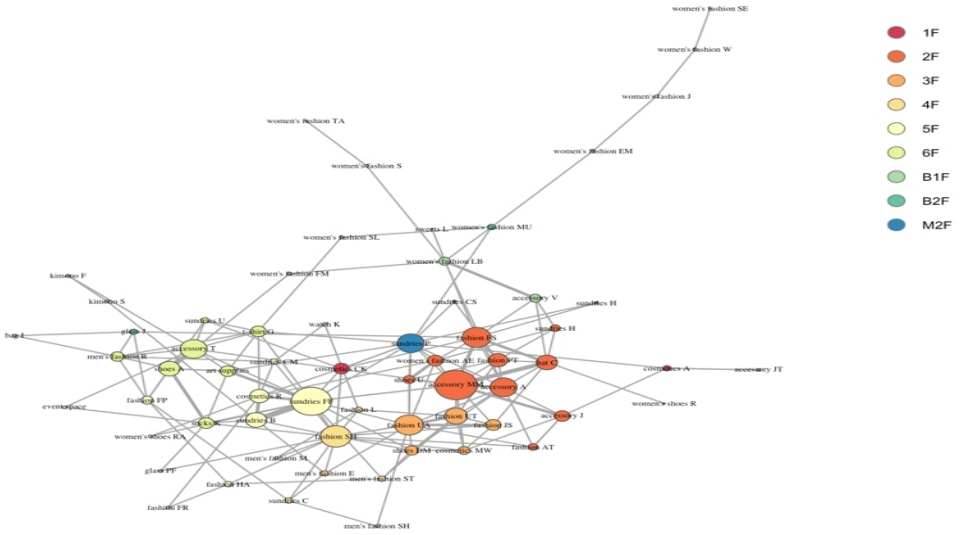

Figure 1: Network analysis results with purchase purpose – degree centrality.

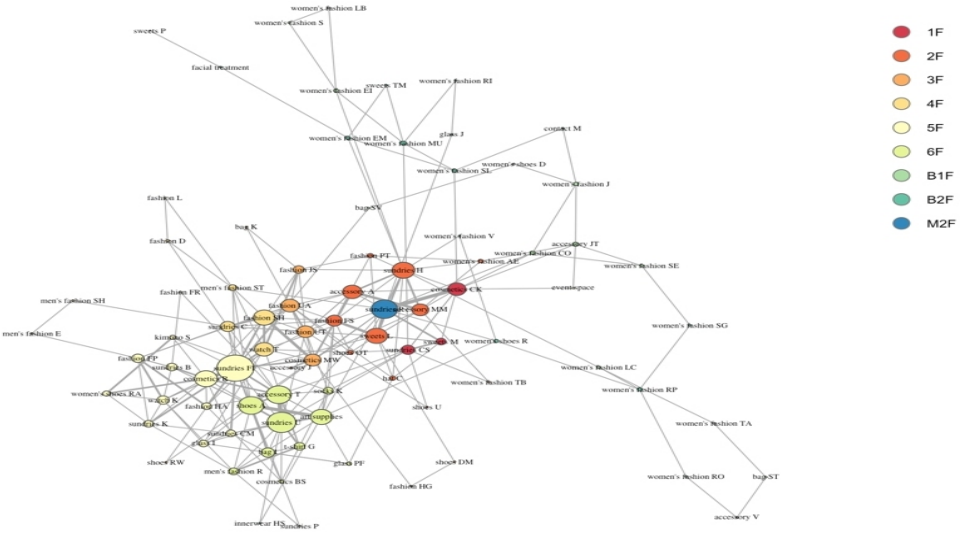

Figure 2: Network analysis results with no purchasing objective – degree centrality.

stores on the 5th and 6Fs, such as sundries FF (5F, sundries) and accessories T (6F, accessories).

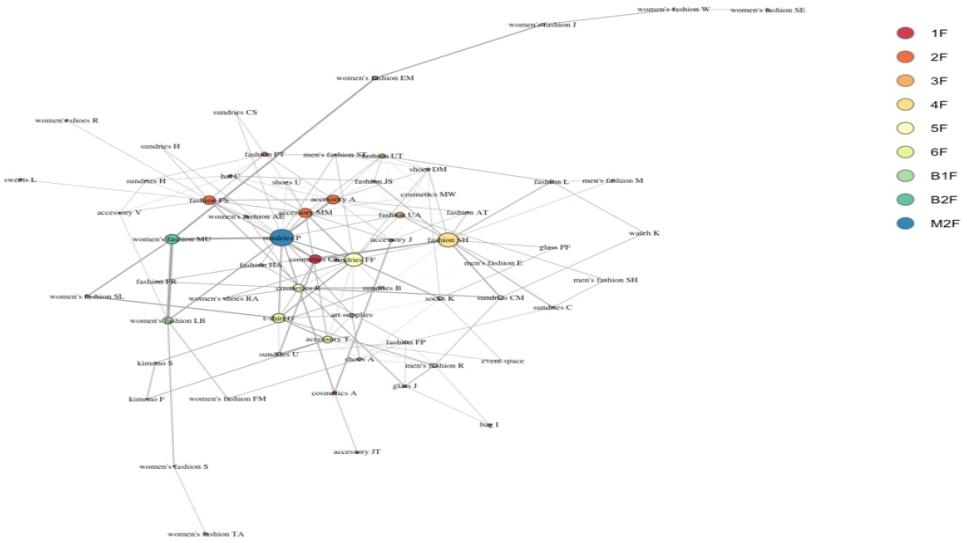

Figure 3: Network analysis results with purchase purpose – betweenness centrality.

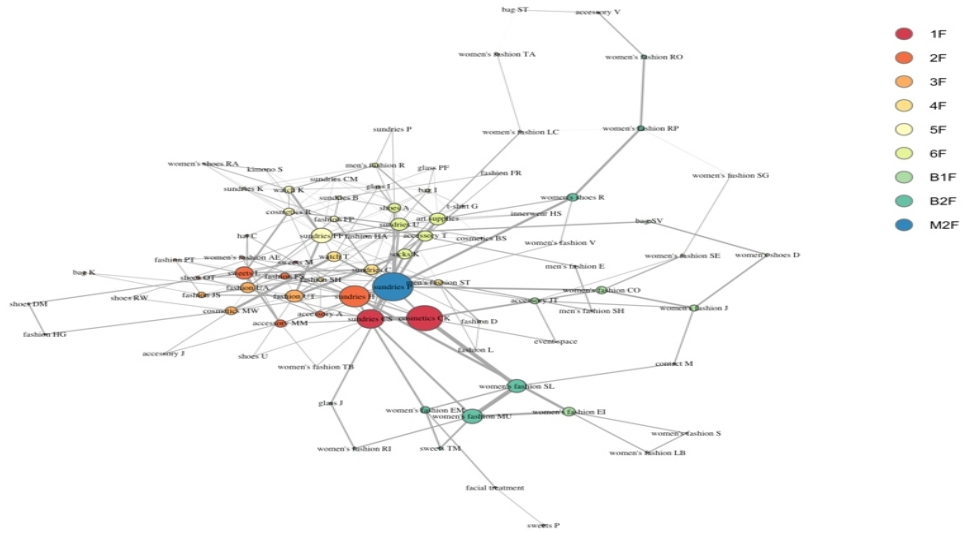

Figure 4: Network analysis results with no purchasing objective – betweenness centrality.

The following observations can be inferred from Figures 3 and 4 as a network comparison of betweenness centrality.

- Compared to those with a purpose group, those without a purpose have larger node sizes, and stores evaluated as relay points, such as cosmetics CK (1F cosmetics) and sundries P (M2F sundries), are more prominent.

These results indicate that group with a purchase purpose tend to make more limited and concentrated trips to stores. As for the stores they visited

at, not only sundries stores that anyone can enjoy looking at, but also accessory and fashion-related stores stood out. In the graph of the group with no purchase purpose, many of the stores were evaluated as relay points, indicating that they were window-shopping-like shoppers with a wider range of shopping trips. Many of the respondents visited sundries stores. Many of the respondents visited at sundries stores. Table 4 shows that the number of store visits with no purchase purpose group was higher than those with purchase purpose group, which confirms these facts.

Next, we compared the network graphs by the presence or absence of a favorite store. A summary of the networks is shown in Table 5. We show the network graphs based on degree centrality in Figures 5 and 6, and the network graphs based on the betweenness centrality in Figures 7 and 8.

The following is inferred from Figures 5 and 6 as a network comparison of degree centrality in the presence/absence of favorite stores.

- With favorite group, the respondents visited by sundries and accessories stores such as sundries FF (5F) and accessories A (2F), as well as fashion stores such as fashion UA (3F, women's and men's) and fashion SH (4F, women's and men's). (2F accessories), as well as fashion stores such as fashion UA (3F ladies' and men's) and fashion SH (4F ladies' and men's), while those with no favorite often visited by sundries stores.

Table 5. Overview of network graphs - whether or not the favorite store.

Group	Number of subjects	Number of nodes	Average number of moves
favorite store	25	87	14.6
no favorite store	11	52	12.5

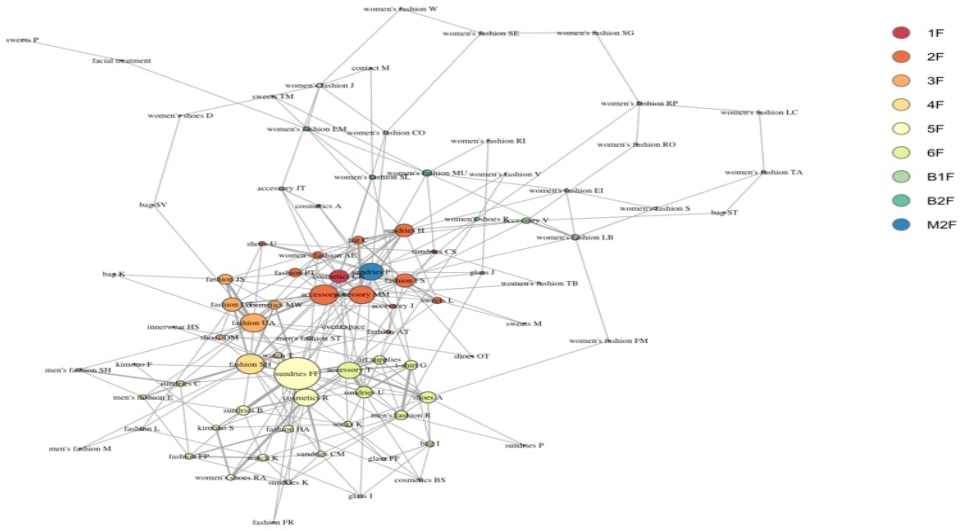

Figure 5: Network analysis results with favorite store – degree centrality.

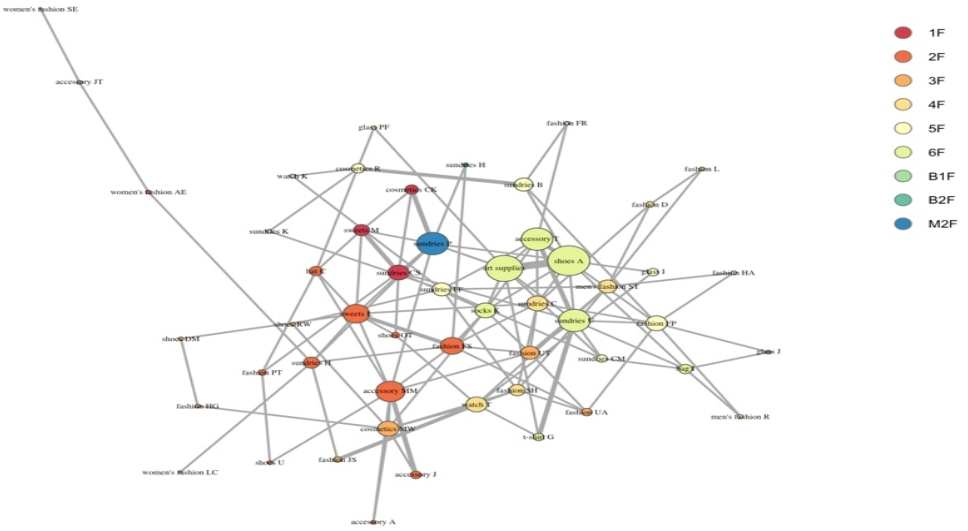

Figure 6: Network analysis results with favorite store – degree centrality.

- With favorite group visited by stores on many floors, while the without favorite group visited by stores on the 6F, such as shoes A (6F shoes) and art supplies (6F art supplies). The node sizes of the stores on the 6F were particularly large and the edge connections were thicker.

The following was inferred from Figures 7 and 8 as a comparison of the network of betweenness centrality.

- Compared to those with no favorites group, those with favorites have extremely large node sizes for stores such as cosmetics CK (1F cosmetics),

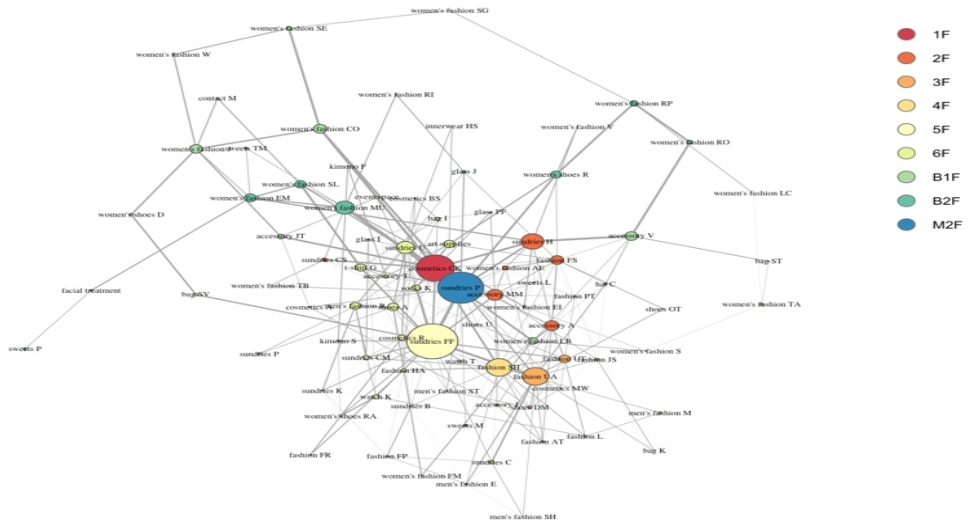

Figure 7: Network analysis results with no favorite store – betweenness centrality.

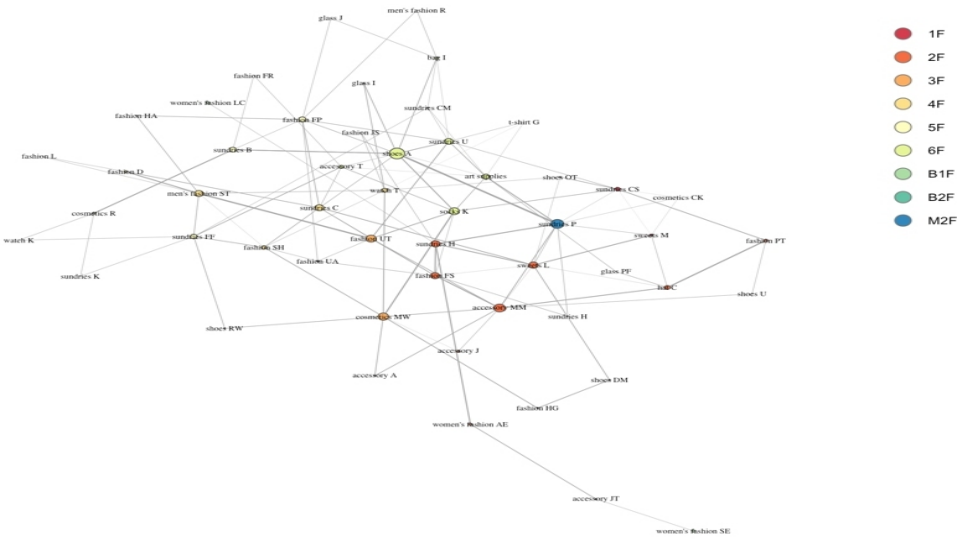

Figure 8: Network analysis results with no favorite store – betweenness centrality.

sundries P (M2F sundries), and sundries FF (5F sundries), which are highly evaluated as relay points.

These results suggest that the group with a favorite store has a wider migratory behavior, as many of them stopped at stores that sell sundries and accessories, as well as fashion-related stores, and stores that play a role as relay points were also apparent. In contrast, the group without a favorite store tended to stop at sundries stores and to visit stores on the same floor, suggesting that they were window-shopping or passing the time. Table 5 shows that the number of trips between stores is higher for those with a preferred store, suggesting that they stop at various stores and enjoy shopping while making exploratory trips around the department.

Store Layout Proposal

From the network graph obtained by the analysis, focusing on the store layouts on the 2nd, 5th, and 6th floors, which were the floors with the most active migratory behavior, we observed the following characteristics.

- Stores with a large sales floor area and stores with ambiguous boundaries with neighboring stores tend to have a wider frontage, making it easier for customers to visit by and stay.
- Compared to other floors, many stores offer a variety of product categories such as sundries, accessories, and cosmetics.
- These stores also play an important role as relay points (key tenants) between stores.

Based on these results, we propose the following measures to promote migratory behavior and purchasing behavior within the building.

- In particular, the B2F, which has few connections to other stores and product categories are uniform, should be arranged to serve as a relay point for sundries, accessories, cosmetics, and other stores to encourage people to visit by.
- By placing sundries, accessories, and cosmetics stores on the 3F, the store can serve as a relay point for fashion-related stores where people are likely to stay.
- On the 5th and 6th floors, fashion stores with a large sales floor area will be placed to take advantage of the connection from the sundries and cosmetics stores, which tend to attract customers to stay.

CONCLUSION

In this study, we conducted an experiment using an eye tracking device to observe the flow of consumers in a large department store with multiple floors, in response to the increasing importance of the experience value in actual stores. Using the data obtained from experiments, we evaluated migratory behavior and proposed measures for store layouts. Visualization of migratory behavior by network analysis showed that consumers with a purchase purpose or with a favorite store tended to migrate to a limited number of stores. On the other hands, without a purchase purpose or without a favorite store tended to migrate to a wider area, as if they were window shopping. In addition, we proposed a store layout around key tenants that are likely to be visited to promote migratory behavior.

The migratory behavior of consumers was evaluated from the viewpoints of whether or not they have a purchase purpose and whether or not they have a favorite store. It is necessary to verify migratory behavior by assuming various types of consumers, taking into account their usual purchasing situations and relationships with the target stores. In our future works, we intend to clarify these issues through other experiments.

ACKNOWLEDGMENT

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