Analysis of the Consumption Action Behavior that Considered a Season

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Abstract. In 2015, Internet use rate in Japan exceeded 82%, smartphone penetration rate exceeded 64%. And, utilization of online shopping was the third in the Japanese ICT services usage. In all ages, its utilization rate exceeded 68%. In the 2011 data that smartphones like iPhone and Android mobile phones began to spread, the use of net shopping was also the third most common. However, attention to utilization ratio, it is 64% in the 20s to 40s, slightly lower than in 2015. In the 50s, it is 51.5%, more than 10% lower. In the 60s and over, it is 36.7%, which is about half as low as 2015. Internet and smartphones popularized, and online shopping became familiar. Net business has become a big market in Japan. To the extent it can not be ignored. This report used purchase data of the Internet shopping site. From the basic statistics we found the following. Users are 65.9% for females and 34.1% for men. There are so many women to use. About the user's age, the over 40's (21.9%) is the most. Next was the result of early 30s (20.2%) and late 20s (19.2%). The population of Japan in 2015 is 59.00% in the over 40s. On the other hand, 5.99% in the early 30s and 5.40% in the latter half of the 20s. It is thought that users increase if the population number is large. Therefore, the main target is not over 40's, it is considered to be in the early 30's and the latter half of 20's. About the time when it is selling. The month with the highest sales is January which accounts for 13.4% of the total. The month with second sales is 11.1% in February, the third is 9.2% in December. Conversely, the month with the lowest sales is May and September, 5.8% of the total. The second is 6.2%, which is April. From this fact, it would be considered sell well are those in the winter season. About customer information. By prefecture, the largest number of Tokyo is 17.5%. It is about 50% of the total in the top six prefectures including that Tokyo. (Kanagawa prefecture 8.4%, Osaka prefecture 7.9%, Saitama prefecture 5.5%, Aichi prefecture 5.5%, Chiba prefecture 4.9%). This is the same ranking as the population ranking by prefecture in Japan. The largest number of registrants to the population is Tokyo. Besides, Kanagawa, Osaka and Kyoto prefectures were more than other prefectures. These four prefectures are the center of the west and east city. The method used covariance analysis and factor analysis. We modeled it about seasonal consumption behavior. The axis of analysis is "When do people buy things?"

1   Introduction

We used the data that is purchase data of one net shopping site for one year. It deals mainly with clothing. Users are 65.9% for females and 34.1% for men. There are so many women to use (Figs. 1 and 2).
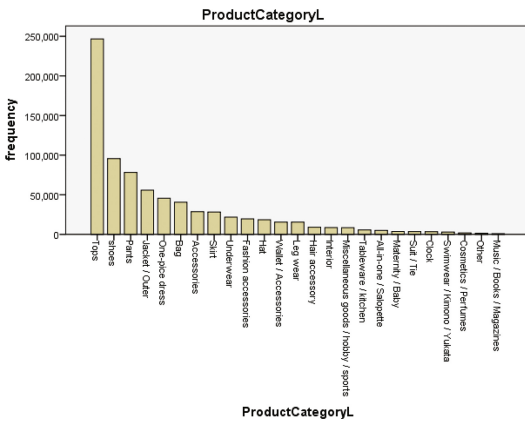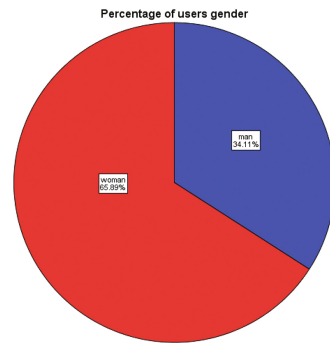

Fig. 1. Sales by item for each year

Fig. 2. User's ratio

On total sales, Tops' sales are the most common with 32.2%. The second is shoes (12.6%), the third is pants (10.2%). It is 5 items including jacket/outer and one piece, which is 68.1% of the total sales. Products are classified in 25 items including others. Of those, 14 items corresponding to 56% are not related to clothing. We handle fashion items other than clothing (shoes, bags, accessories, hats etc.). That is one of the reasons why sales are growing. Products such as dresses and skirts, hair accessories, maternity, baby, etc. are enriched because of the large number of female users.

2   About the User's Age

About the user's age, the over 40's (21.9%) is the most. Next was the result of early 30s (20.2%) and late 20s (19.2%). The population of Japan in 2015 is 59.00% in the over 40s. On the other hand, 5.99% in the early 30 s and 5.40% in the latter half of the 20s. It is thought that users increase if the population number is large. Therefore, the main target is not over 40's, it is considered to be in the early 30's and the latter half of 20's (Figs. 3 and 4).
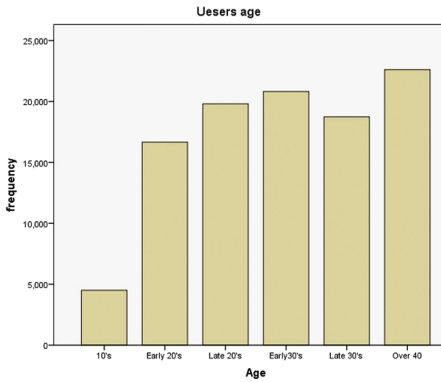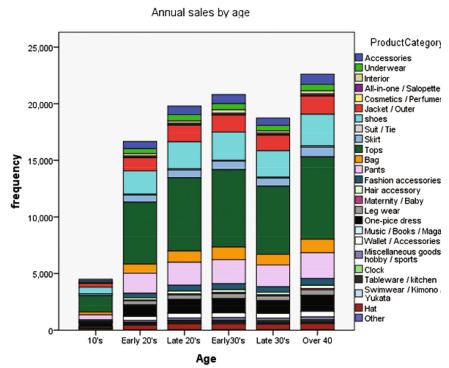
Fig. 3. Period of user's age

Fig. 4. Annual sales by age

Regarding sales by age, "Tops" is most bought at any age and is around 32%. The second is shoes, the third is pants. This is the same as the overall result (Figs. 5 and 6).
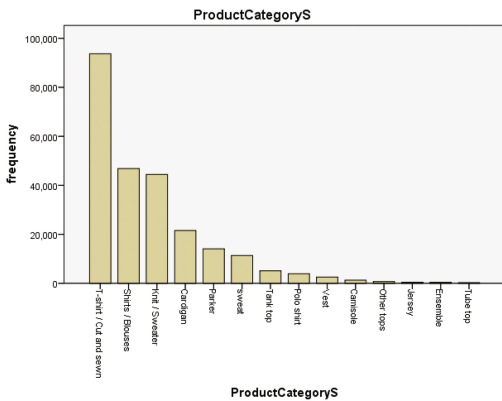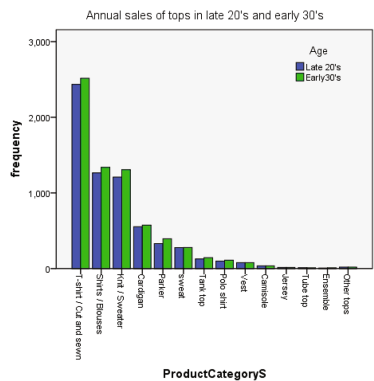

Fig. 5. Total sales of "Top"

Fig. 6. Annual sales of tops in late 20's and early 30's

"Tops" is the most popular product in annual sales, T - shirts/cutsaws are 38.4%. This is the same result even in the whole case, even in the main target that half of my 20s and early 30s. T-shirt/cut-saw category has sales of about 40% or more. Next, shirts/blouses (19.3%) and knit/sweaters (18.6%) are well selling. The top three are selling well (Figs. 7 and 8).

Shoe categories are mostly purchased mainly by people over 40 years old in most items. However, the purchase of rain shoes in the late 30s and early 30s is somewhat larger than in other age. Moccasin/deck shoes are almost flat except for teens. The beach sandals are slightly larger in the early 20s to the late 30s.
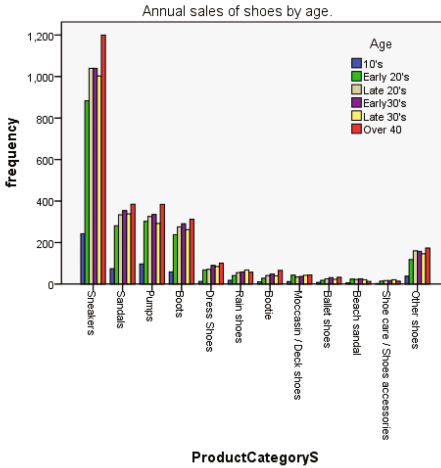
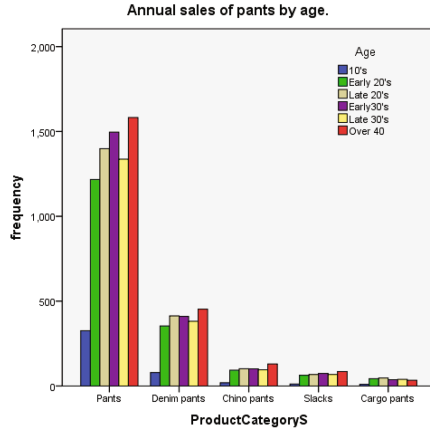**Fig. 7.** Annual sales of shoes by age.

Fig. 8. Annual sales of pants by age.

As for pants, items of pants, denim trousers, slacks and cargo pants are within 3% of the difference between the inner stages of over 40s and early 30's. But, Chino pants only the difference between for the over 40s and early 30s will be over 6%. The purchase rate of over 40s is slightly higher.

3   Seasonal Difference

The month with the highest sales is January which accounts for 13.4% of the total. The month with second sales is 11.1% in February, the third is 9.3% in June. Conversely, the month with the lowest sales is May and September, 5.8% of the total. The second is 6.2%, which is April. From this fact, it would be considered sell well are those in the winter season

According to the Japan Meteorological Agency, March to May is Spring, June to August Summer, September to November fall, December to February Winter. From this, it can be said that things are selling well during the winter and the summer season. Japanese long vacations are mainly year-end and New Year holiday, spring break in March, summer vacation in August. Especially, the sales are good when in February and July before spring vacation in March and the summer vacation in August (Figs. 9 and 10).

Spring and autumn are seasons when sales fall. In Japan, spring (April) is the new fiscal year, and autumn (September) is the new term. Regarding Spring, sales are suddenly dropped while sales are favorable until March. Because the people buy clothes as preparations for the new fiscal year, it seems that sales in March become many. I think that preparations have been completed in the previous month, or there are not need to buy clothes, or there spent money in preparation in the previous month. Annual sales by season, "Tops" is the most common in around 32%. It is similar to the whole data. The second is shoes, the third is pants. (Figs. 11, 12 and 13)
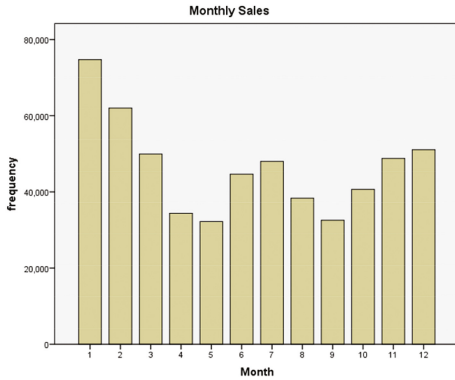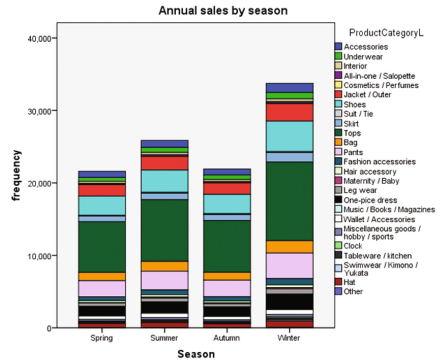
Fig. 9. Monthly sales

Fig. 10. Annual sales by season
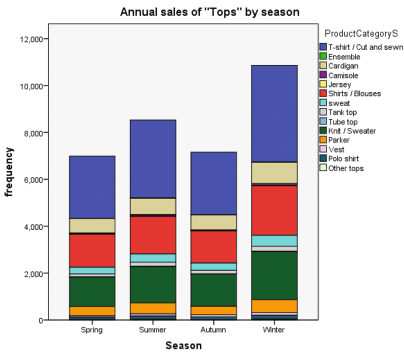

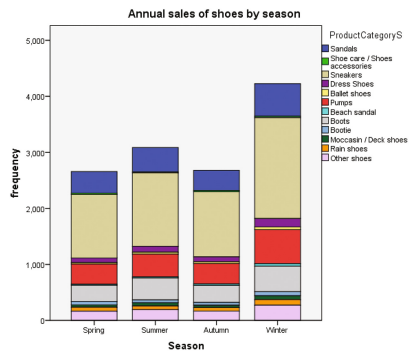**Fig. 11.** Annual sales of "Tops" by season

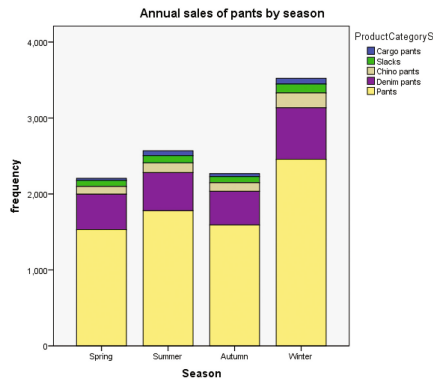
Fig. 12. Annual sales of shoes by season

Fig. 13. Annual sales of pants by season

The sales ratio of each item does not change, even if the seasons are different. T - shirts/cut - sews are among the best selling in 'Tops'. Next, shirts/blouses and knit/ sweaters are well selling.

In genres of shoes, sneakers have about three times the sales of sandals that is second selling. Sandals, pumps and boots have more than 10% sales. There are more characteristic than other items.

In the group of pants, "pants" that includes all things that can not be divided into items such as denim pants and chino pants with patterns and colors items are sold most. "Pants" is about 3.5 times the sales of denim trousers. (Figs. 14 and 15)
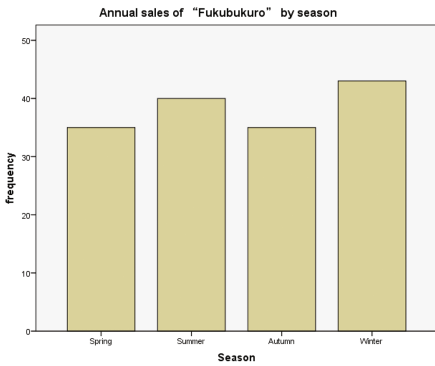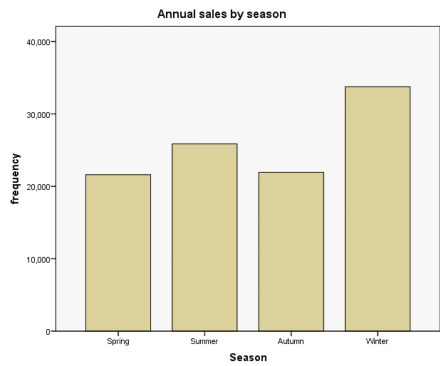

Fig. 14. Annual sales by season

Fig. 15. Annual sales of "Fukubukuro" by season

"Fukubukuro" is like grab bags and mystery bags or we may call them lucky bags. These usually contain variety of goods that are much more valuable than the price of the bag.

We made comparison between total sales and sales of "Fukubukuro". Its winter sales are 32.7% and in the spring is 20.9% of the total. There is a difference of about 12%. However, the genre of the "Fukubukuro" is different. Winter's sales are 28.1% and spring is 22.9%. The difference shrinks to about 5%.

4   About Purchaser Information

By prefecture, the largest number of users in Tokyo is 17.5%. And the top six pre- fectures including Tokyo occupy about 50% of the total. (Kanagawa 8.4%, Osaka 7.9%, Saitama 5.5%, Aichi 5.5%, Chiba 4.9%) This is the same ranking as the pop- ulation ranking by prefecture in Japan. There were four registrants to the population, Tokyo, Kanagawa, Osaka and Kyoto. These four prefectures are the center of the west and east. We analyzed that Tokyo and Kanagawa as the east side, Osaka and Kyoto as the west side (Figs. 16, 17 and 18).
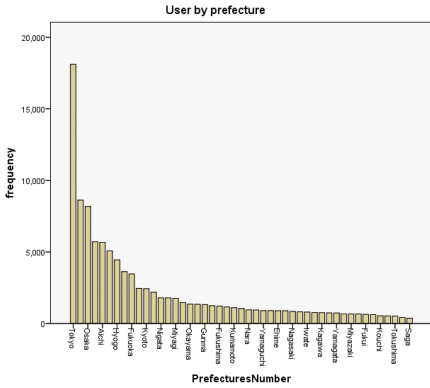
The total sales is overwhelmingly in the eastern side of Tokyo and Kanagawa. But, even if the regions are different, the ranking of the top does not change. The top selling is "Tops". The second is shoes, third is pants. There is a little difference from the 7th. However, the difference is at most 4 ranks. (Figs. 19, 20 and 21)
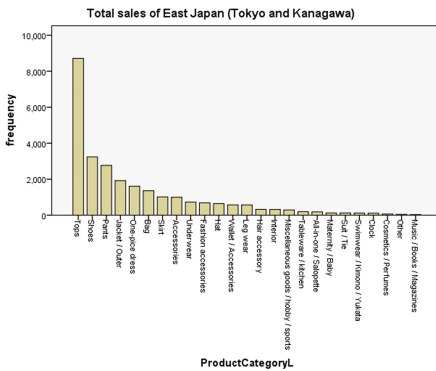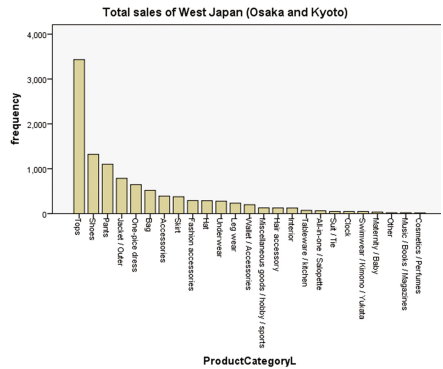

Fig. 16. User by prefecture

Fig. 17. East side user

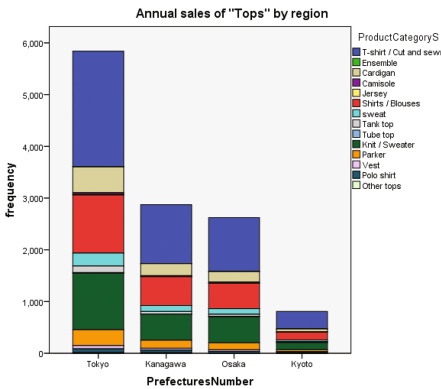**Fig. 18.** West side user

Fig. 19. Annual sales of "Tops" by region

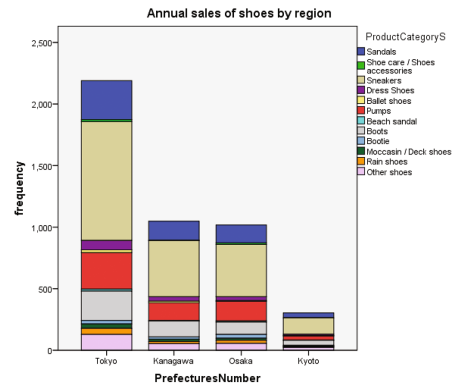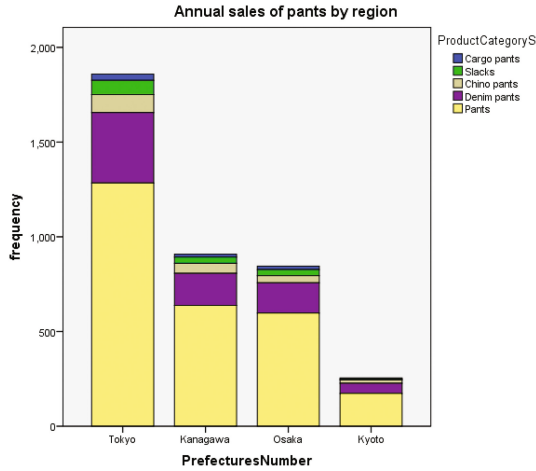**Fig. 20.** Annual sales of shoes by region

Fig. 21. Annual sales of pants by region (left)

Factor analysis of questionnaires sent to users
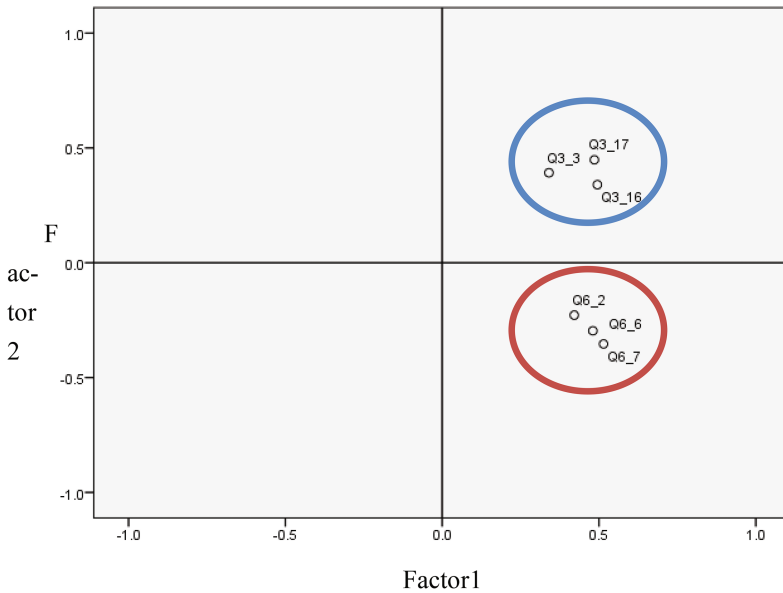

Fig. 22. Factor analysis of questionnaires sent to users

The sales ratio of each item does not change, even if the regions are different. T - shirts/cut - sews are among the best selling in 'Tops'. Next, shirts/blouses and knit/ sweaters are well selling.

In any region, and in the genre of shoes, sneakers are the first and sandals are sold second. However, in Kyoto only, the third are boots and the fourth are pumps.

This rank has been reversed the comparison between this and the other. Sandals, pumps and boots have sales of more than 10% in any area.

Pants were in the same order as the whole data, too.

We analyzed the factor of the questionnaire that we went to the user. Blue circle is a person who cares about fashion for his title in life value. Red circle are those who purchase clothes and the like as they are forced to need seasons and events (Fig. 22).

5 Discussion/Summary

We analyzed the data from the viewpoint of age, season, month and region. However, we did not see a big difference in the inside of the products we purchase. There were minor differences. It did not significantly affect the overall data.

There is bias in purchase number by season and month, many items record high sales in winter. There have a big difference in sales with other seasons. However, the "Fukubukuro" had little difference in seasonal sales. From this, we think that if we use a means the "Fukubukuro" in spring and autumn when less sales, we might be able to sell more.

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