Short Paper

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Configurational Comparison of City Center Shopping District and Shopping Mall, with Observation of Shop Locations

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Abstract
Recently in Japan, cities' central shopping district, which accounts on the economic part of a city, is declining. In the background of this phenomenon there is the increase of roadside mega shopping malls, where shoppers choose to complete their shopping within it. Therefore it is required to a city central shopping district that they are better improved as a complete commercial space. Through recent research such as one by Polly Fong of University College London, it is shown that the Space Syntax Theory is useful in designing the pedestrian movement within a commercial space. However there is not much research that applied this theory to a city's domestic shopping district. Here we define "shopping district" as a region of the city where collection of retail stores are aligned along a street side, and road side "shopping mall" as mega sized buildings that are planned, built and managed mainly by a single development company, with variations of tenant included. The purpose of this paper is to reveal the natural law of human attraction to certain classification of shops. In order to this attempt, we treat both "shopping district" and road side mega"shopping mall" as "commercial space", and compare the correlation between the spatial property derived from the Space Syntax Theory and the tenant arrangement of these two groups. Through this we attempt to discover the successful point of the creation of commercial space by "shopping malls", and compare to those of "shopping district", which theoretically relates to the reason why consumers choose to shop at "shopping malls." We chose 2 shopping malls and 2 shopping districts from Kanto district of Japan, and attempt the following process. First, we analyze each commercial space using the values of the Axial analysis using the Space Syntax Theory, and index each pedestrian space of the retail store by the numerical value derived from the analysis. Then, we plot each value and analyze the correlation between these values to the shop classification. Furthermore, we compared the relation between the Space Syntax values by scattered diagram. Lastly we compared the outcome of the analysis from those of shopping malls to those of shopping district.

The outcome of this analysis comes that correlation between shop classification and Space Syntax values were found in some classification; such as restaurants, household shops and children's shops. The relation between Depth value and Global Integration value showed difference in shopping districts and shopping malls, implying the importance of configurational analysis for shop locations.

It is concluded in this paper that shop locations in a commercial space was comparable using certain Space Syntax values, and that it is crucial in the construction of commercial space.

The impact of shop classification in the analyzing of shopping districts

1.1.Introduction

In recent years, the shopping districts of major cities have been declining. The change in customer needs and the increase in the automobile consumption have led the public to shop in the convenient shopping malls. This circumstance has induced an additional problem of the weakening of interrelationship between the individual shops within the districts. Historically, many Japanese cities have been developed around city center railway stations, where the core of the city was located and community was created through shopping. Therefore the deterioration of city center shopping districts in Japanese cities is crucial in means of both local economy and community, and currently the nation as a whole is taking action towards a major reconstruction in the regional development.

Since the walking route of the shopping customers is one of the most major factors to contribute to the shopping motivations, therefore architectural factor in shopping environment has significant influence. However few were done with relating the physical “space” and “location” with taking in count of classifications of individual shops included in the area. However, it can be easily thought that the consumers’ shopping mind and the physical mapping of the roads and shops are strongly related. As regards to research on physical “space”, the Space Syntax (as SS from here on) Theory, which developed in London, introduced a new concept of “depth” and has left several research results in the architectural area of study. Using this theory, it may be possible to characterize and compare the spatial construction of shop distributions of different city center shopping districts, and analyze them as relatives to predict the visited customer’s shopping behavior.

1.2.Objective

In a complicatedly structured city, the distribution of shops analyzed from the point of view of “depth” becomes critical. However previous research using SS has concentrated and limited to the relationship between the pedestrian movements and road constructions. As Ratti has attempted in his research to “offset” the “external factors” such as a road’s shopping means by inserting several extra axial lines, although this method requires experimental data, and the relationship between the actual purpose of each customers and the classifications of the shops are not really held in to consideration. This consideration is thought to be significant in an analysis of a shopping environment in this study.

Therefore, the purposes of this paper are the followings:
1) To identify the relationship between spatial configuration and the distribution of the classified shops.
2) To compare the results of analyzed city center shopping districts to the result of shopping malls, and clarify the difference and problems of localized relationship of individual shops in city center shopping districts.

Under this purpose, Jiyugaoka and Daikanyama from Tokyo in Japan are selected as representative samples of the city center shopping districts, and Lalaport Yokohama and Outlet Park Iruma as the representative sample of shopping malls. Below are the explanations of the sample selections.

1. City center shopping districts: Jiyugaoka & Daikanyama
   These two districts are representative samples of shopping district. Studies done in the past have showed the different characteristics of these cities, which is comparable to the result of the analysis using the SS Theory
2. Shopping malls: Lalaport Yokohama & Outletpark Iruma
   Lalaport Yokohama is a chain shopping mall, and here it is a representative of the most fundamental shopping mall consisting of a well balanced genre of shops for all customers. Outletpark Irima, which is more geared towards apparel shops, is representative of a selected target market.

Introduction of the “classified axial map”

2.1. Analysis of shopping environment with taking in count of shop classifications

SS theory, introducing the concept of quantified value of “Integration” and “Depth”, made it possible to analyze pedestrian movements and other configuration oriented movements. However, not many researches have been done with taking in account of personal fondness to certain quality of space, especially for shopping objections. Ratti and others have done weighting by adding extra axial line to shopping streets, but this does not take in account of individual shopper’s personal intentions.
In this study, we;

1) added the axial line representing the entrance path to each shop, and
2) assigned each entrance a classification according to the character of shops each shop. The figure below shows image of the axial map used in this research. The SS values of the axial line representing the entrance is then assigned as the shops’ values and have been analyzed.

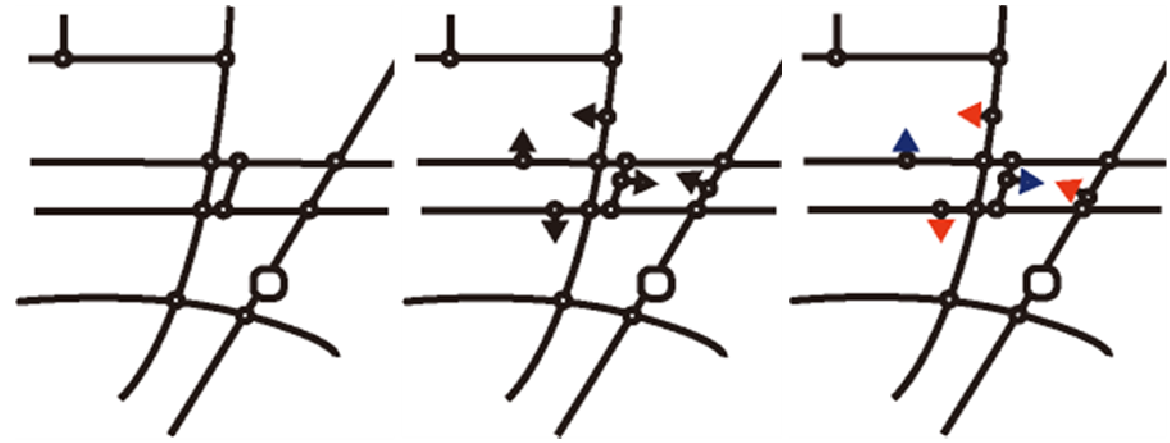

Figure 1

Analyzing of the shopping district, introducing the example of Jiyugaoka

3.1. Scale comparison of each sample

In order to discuss about the shop allocation, comparing the scale of analyzed sample is crucial. The following figure shows the scale of each sample by aerial view.

The top two shows the view of two shopping districts (left: Jiyugaoka, right: Daikanyama) and the bottom two shows the view of two shopping malls (left: Outlet park Iruma, Lalaport Yokohama). The scales of the analyzed samples are much different between the shopping districts and shopping malls, although the number of shops are similar. It can be thought from this fact that shoppers tends to walk a longer distance in shopping at city center shopping districts.

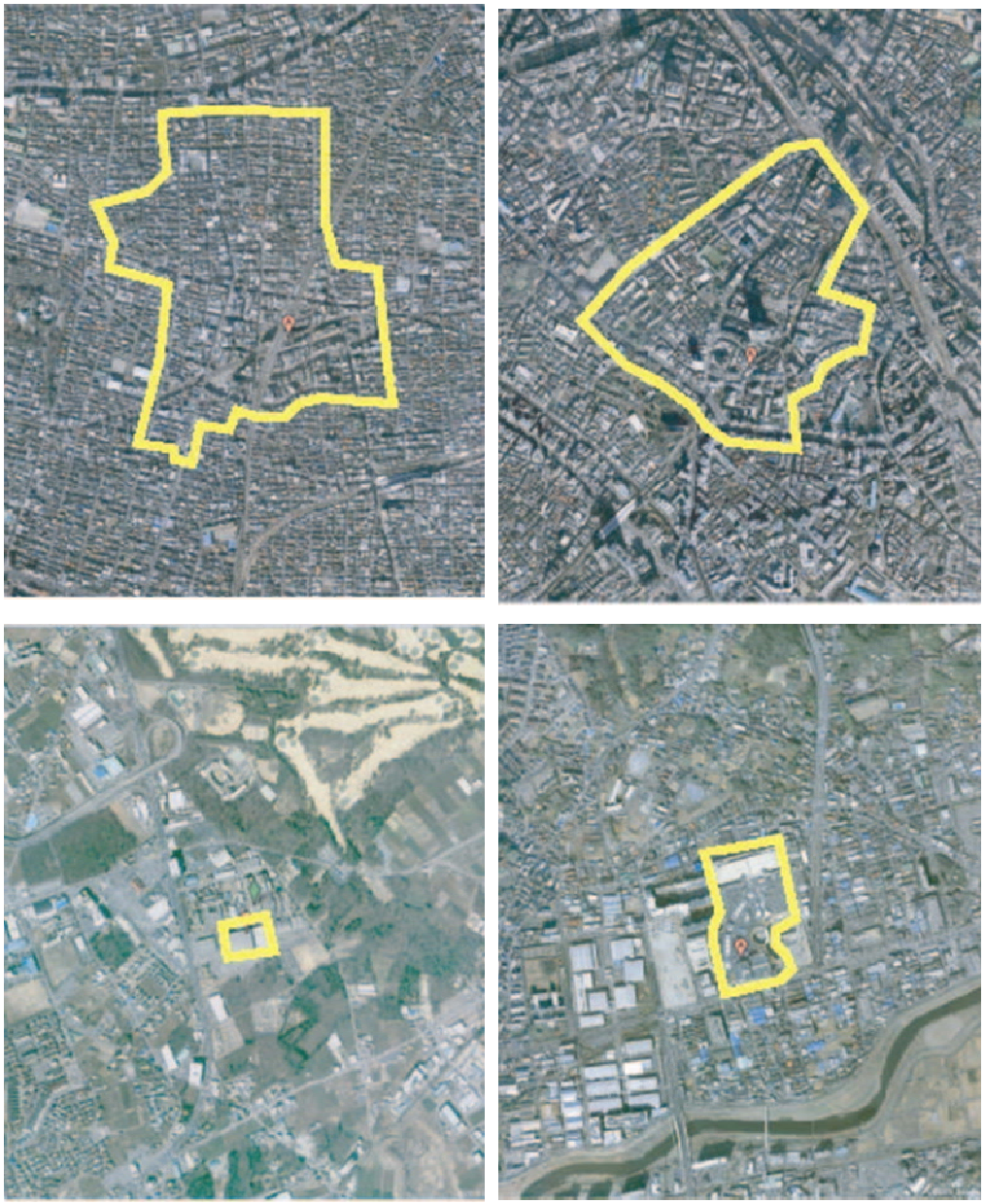

Figure 2

3.2. Spatial allocations of shops in each sample

Next we will show the result of research about allocation of shops for each category. The categorized classifications of shops are

1) business categories ,
2) target gender, and
3) target age.

The results are shown in the following figure for Jiyugaoka, three figures representing three categorizing groups. The three figures each shows the categorizing groups, and the central crossing in figure represents the railway station. From the figure, we can see for example that the restaurants are relatively close to the railway station compared to household stores, although widely dispersed.

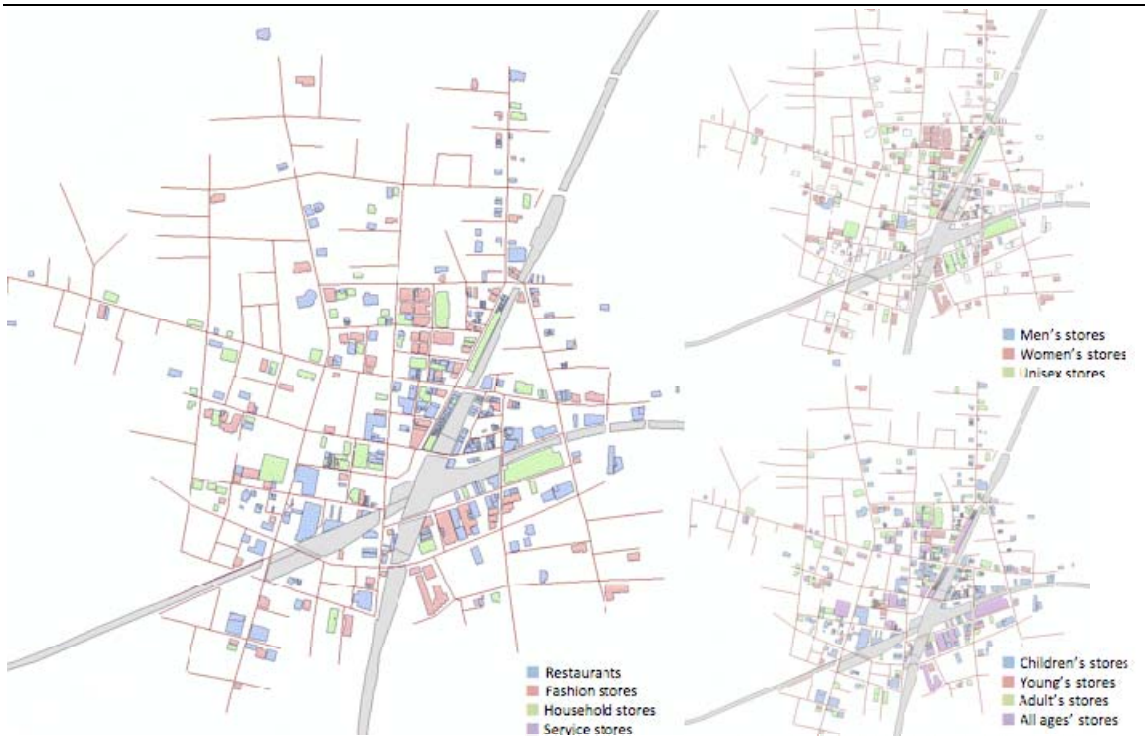

Figure 3

3.3. Accounting SS values to each shops

Using the procedure discussed, we assigned each shop the SS value of the axial line representing the entrance of each shop. The values that have been especially discussed are the depth value, depth from entrance (starting from the station in the case of shopping district, and the main entrance in the case of shopping malls), and the global and local (r=3) integration values.

The following figure shows the result of the procedure in the case of Jiyugaoka. We can see from the result that the east side of the station has less Integration values in general compared to the west. It can be interpreted that the west side of the station is the probably the more central part of the city, which in fact it is.

Figure 4

Figure 5 shows the places where it can be especially characterized within Jiyugaoka, in the figure of Integration (r=3). From the figure it can be understood that area of shop aggregation has high integration values, whereas the shops besides the pedestrian street located at the south part of

the city has low values. The values differ greatly at the two sides of the vehicle roads, where it becomes prominently lower when it goes across the road.

Figure 5

In this section we introduced the result of Jiyugaoka as a representative result. In the following section we will show the quantitative result of analysis for all samples, and attempt a comparison for deducing conclusion.

Characterizing and interpreting of the samples from the quantitative comparison using SS values

4.1. Depth vs. Integration Value

Comparing the value of Depth and Integration value as ratios, it is able to see the efficiency of location to expected pedestrian fluency. The scatter diagram on the top of Figure6 has Depth from entrance value on the x-axis and Integration value on the y-axis.

The quadratic line of best fit obtained from the plots showed a quadratic line for both shopping malls, and a comparatively monotonically decreasing line for both city center shopping districts. From this fact, it can be understood that being successful of creating highly integrated place in the core of the area, means to have quadratic shaped plot.

Furthermore, within the two city center shopping districts, Jiyugaoka has more sharpness in fall of Global Integration value compared to Daikanyama. Past research of Ushijima conducts an inquiry to a total of 2000 people, which showed that 91.6% of people visiting Jiyugaoka for shopping reason are intended for purely shopping reasons or a combination of shopping and eating, compared to the result that 28.6% of people visiting Daikanyama has intention of walking around the town. From the result of plot compared to this result of research by Ushijima, it can be thought that this steepness of fall in global integration value possibly represents pedestrian aggressiveness of walking distance while shopping.

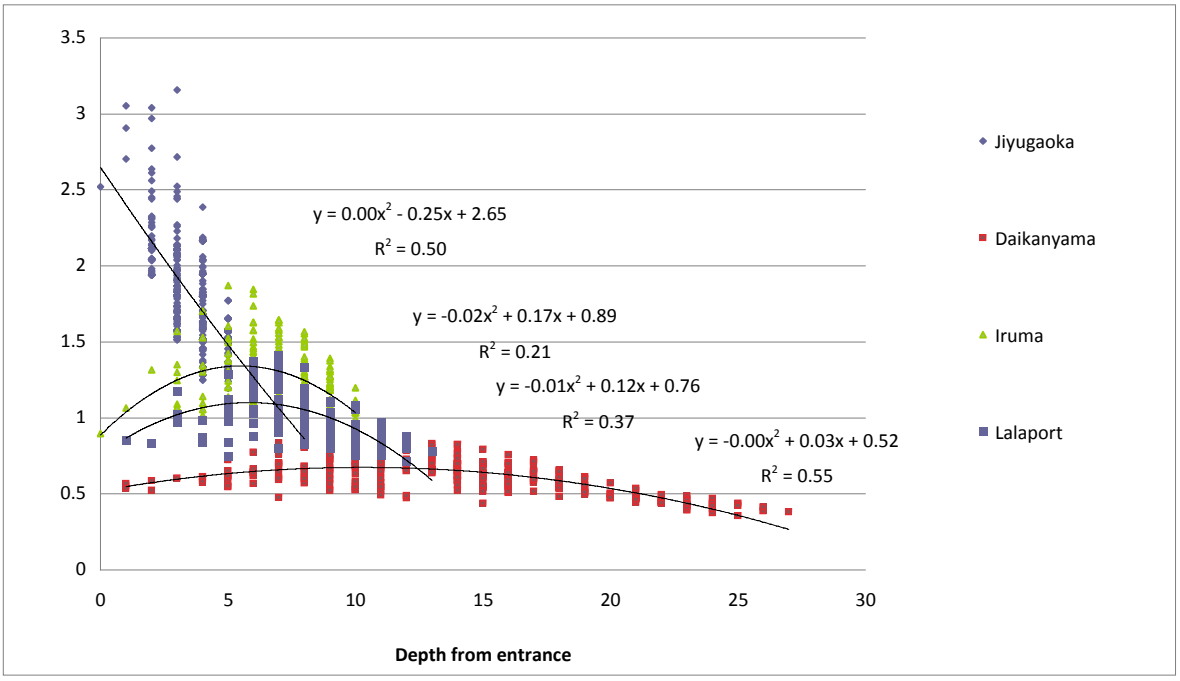

Figure 6

Figure 7

Further apprehensions can be earned from reading of the outliers. Outliers for plots of both shopping malls are found at places with greater depth values, whereas for plots of Jiyugaoka it showed more outlier at places with smaller depth value. The meaning of these two kinds of outliers contradicts in sense of creating shoppers' pedestrian movements. Five delegate points from the two shopping malls as outliers are shown in the next figure above.

The locations show places with more axial line intersections, such as the corner and points of intersection, with some exceptions at the aisle. These locations can be thought to have efficient pedestrian movements. In the other hand, Jiyugaoka, which has outliers at smaller depth can be interpreted that it has locations within the area that pedestrian movements intensively concentrate, leaving the other locations to be inanimate.

4.2. Regression Analysis

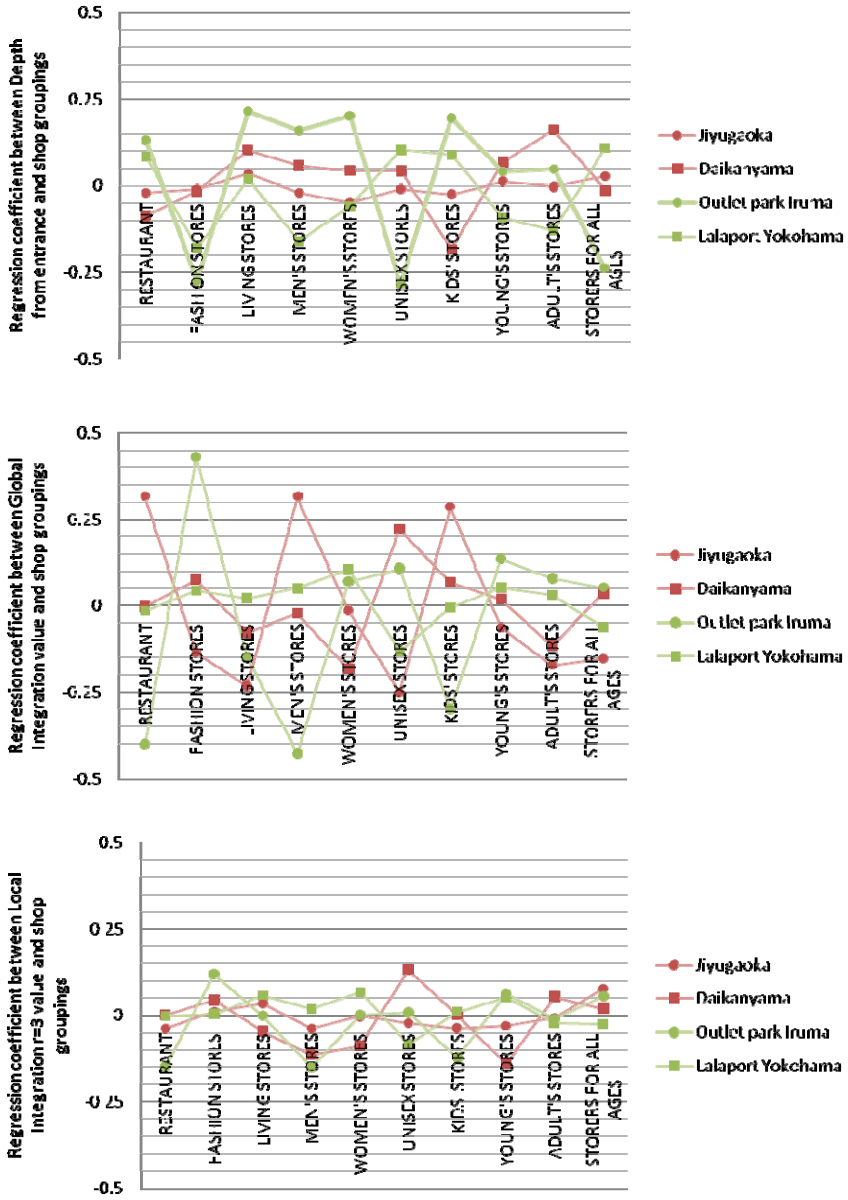

Figure 8

The previouse are the result of the simple regression analysis, between each shop classifications and the SS values. The following figure8 are the results showing each regression coefficient on the y-axis and each shop classifications on the x-axis, three diagrams representing the results for depth from entrance, global integration, and local integration (r=3).

From the obtained graphs, judging that a coefficient value of over 0.200 as a weak correlation and over 0.400 as stronger correlation, we were able to say the followings.

1. The correlation between location of restaurants and global integration opposed with Jiyugaoka and Outletpark Iruma, where Jiyugaoka had positive correlation and Outletpark Iruma had negative correlation. People in restaurants of Jiyugaoka may have pure arrival intentions of eating, whereas the same possibility is thought to be rare in a shopping mall like Outletpark Iruma. From this result we could derive that calculating the correlation of restaurants and global integration may be useful for characterizing the commercial space in means of shopper's eating intentions.

2. The locations for stores for men and the value of global integration was big in Outletpark-Iruma and Jiyugaoka, where in Outletpark-Iruma men's store was located at places of less global integration and Jiyugaoka at more. From this, it could be thought that male shopper favors to shop at quiet place in shopping facilities, and in a town like Jiyugaoka, male may favor to shop at more integrated locations, which could be understood that men are not aggressive in shopping compared to women. At places like a city center shopping district, it is easier for men to find their interested items at locations nearby regular walking paths, whereas at shopping malls they favor to evade the main flow of shopping customers.
3. For shops with children's items, it had positive value for correlation with both global and local integration values for Jiyugaoka and Daikanyama, and negative value for Outletpark-Iruma and Lalaport-Yokohama. Children's shops are thought to be located at safer place in the shopping environment, which could be understood from the result that these places are to be places with fluent pedestrian flow for a city center shopping district, as in shopping malls they tend to keep children in a quieter locations, away from the main flow of shopping customers.

Conclusions

5.1. Conclusions

Using the SS values, we analyzed four sample commercial space; two city center shopping district, Jiyugaoka and Daikanyama, and two shopping malls, Outletpark Iruma and Lalaport Yokohama. These samples vary in scale and arrival objections, though the result showed that comparison using depth value and integration values, global and local, was profound in understanding the character of the commercial environment. Shop locations were quantitatively analyzed, and the result of the comparison was as follows.

1) Ratio of depth and global integration values.
It was understood from the results that plotting depth values and the integration values had impact on understanding the character of a shopping environment to attract the pedestrian to the core. The result showed that sampled shopping malls were successful in this sense compared to the sampled city center shopping districts.
2) Regression analysis
From the results of regression analysis, behavioral characteristics of shopping customers and the accordingly located shop locations were inferred. Matching of customers' behavioral pattern and shop locations are significant in the creation of successful shopping environment, and the impact of SS analysis is clarified.

From the above statements, the significance of the followings has been shown;

1) Accounting each shop a categorical group was effective in finding the group's location tendency in the analysis using SS theory.
2) Using SS theory, comparison between commercial space with different scale and objections was effective.

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