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**STUDY ON SHAPES, COLORS AND ORNAMENTS ACCORDING TO ARCHITECTURE PSYCHOLOGY: A CASE STUDY OF ROADSIDE BUILDINGS IN KITAKYUSHU**

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**ABSTRACT**

Psychology in architecture is one that is highly considered in urban planning, or even smaller, the buildings in it. In this research, the study of shape, color and ornament is the focus of the research. This research is a basic study for more in-depth research on the psychology of architecture in urban Kitakyushu. This study aims to study the shape, color and ornamentation of buildings scattered in the center of urban growth in Kitakyushu. The survey results in this study will be assessed based on the theory on psychology in architecture. The method used in this research is through a design and visual approach, with qualitative approaches. In the survey that has been carried out, it was found that the characteristics of Kitakyushu buildings are generally box-shaped with the use of natural colors, such as the color of the ground. This study also assumes that building design, color selection and ornamentation affect urban vibes in Kitakyushu and directly affect the psychology of the people in it.

**Keywords:**

Architecture Study, Architecture in Psychology, Roadside Buildings, Kitakyushu

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**1. Introduction**

Buildings are made to meet needs, such as protection, covering up, and indeed socializing in constrained numbers. The architecture itself is displayed in conjunction with human history itself, in an editorial composed by (Lee, 2016) it is evaluated that there was in around ten thousand before century within the Neolithic time, where individuals as of now knew a more not too bad put to live than within the stone-age. Individuals started to get it and need excellence of beauty, and that is when the architectural design was made. Nowadays, design is now not almost about magnificence. The requirements for architectural things have developed since the creation of the "building fashion" started by eminent modelers. Indeed before the Covid-19 widespread hit mankind, design has been connected to the creation of building works related to wellbeing, and since this widespread, the requests for wellbeing that can be connected to any field, counting architecture are expanding.

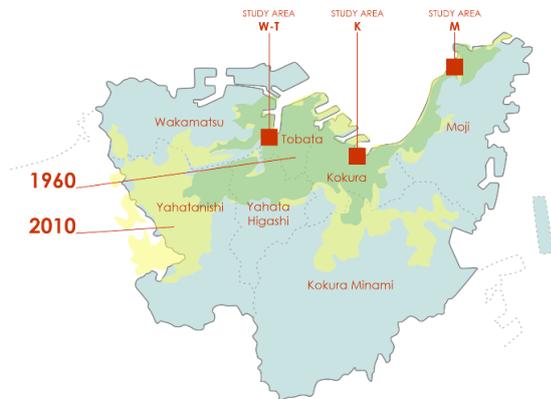
Psychology in architecture, of which plays a major part in one of the determinants in deciding the design that suits the individuals within the environment and of course the users. Interestingly within the world of architecture, numerous things that are applied in design are determined by where who, and how the environment lives, so it significantly impacts the psychology of the environment.

This investigate points to ponder architecture in terms of shape, color, and ornament that are influenced or indeed influence the environment or in terms of psychology. This research is a basic study for more in-depth research on the psychology of architecture in urban Kitakyushu.

Architecture, by looking at its shape and the area where it is built can be effectively analyzed by individuals to understand how architecture evolved (Lee, 2016) on the other hand, in the article entitled "what is architectural psychology?" It is said that architecture influences psychology and essentially influences the planned environment, as well as the human behavior in it which is influenced and influences (Abel, 2021). One of the studies by Ming et al. about how architectural style influences the feelings of an individual or gathering of individuals can also be said that architecture acts as a stretch reliever through diverse building forms. Individuals with distinctive foundations, and in common, architecture is considered to have an enormous effect as it implies diminishing stress, for example, individuals who feel themselves beneath high pressure in their lives, lean toward a box shape, firm, and tend to be sharp (Ming-Chyuan Ho, 2021).

In their experiment (Ming-Chyuan Ho, 2021) they recommended that in public buildings, buildings with bent shapes have a more noteworthy chance of diminishing stress. They moreover appear information from their

interviews almost buildings that have consistent and clear line elements that can calm people's psychology since it alludes more to the most profound sense of being. In another consideration, the frame embraced by the environment or nature encompasses a great effect on cultivating a feeling of consolation (M.F. Sultanova, 2021).



**Figure 1. Kitakyushu (Case Study Areas)**  
Source: Personal Documentation, 2022

In this consideration, Kitakyushu is one of the regions in Kyushu that encompasses an exceptionally curiously verifiable foundation. Kitakyushu is one of the areas that appear Japan's awesome move in advancement in terms of economy, environment, and of course architecture. Based on the center of this inquiry, buildings in a few regions in Kitakyushu will be analyzed based on shape, color, and adornment to see the advancement of architectural styles spread in Kitakyushu.

The buildings that were tested in this consideration were taken in ranges that got to be the beginning point for populace development and history in Kitakyushu (Perihele, 2014), to be specific buildings within the Kokura (Code K) range, Mojiko (Code M), and along the range associated with the Wakamatsu-Tobata Bridge in Wakamatsu-Tobata (Code W and T). The reason for choosing it is based on the age of the design that's spread in each region (Akagawa Takao, 2020).

**2. Research Method and Scope**

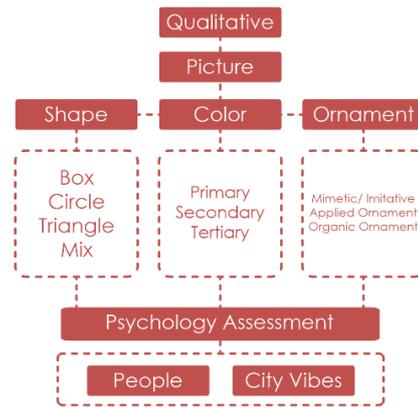
The strategy utilized in this inquire about is through a plan and visual approach, with subjective approaches. In this study, a few restrictions have been connected, and this inquiry about points to ponder the engineering that was created in Kitakyushu is seen from the facade of the building and categorized into three sorts, to be specific based on shape, color, and adornment. To evaluate the effect of these three categories on the creating environment, the hypothesis of psychology in architecture is utilized in this think.

The criteria limits connected to information collection are as follows:

1. Being in a swarmed area,
2. Found in a range associated to open transportation,
3. The visual of the building is chosen based on the assorted appearance,
4. The chosen building is found in a zone that's very frequently passed by individuals.

The chosen zones are assembled based on the foremost dominant building category within the range, such as

Kokura as a commerce zone, Mojiko as a tourism zone, and Wakamatsu-Tobata as a housing zone.



**Figure 2. Research Framework**

Source: Personal Documentation, 2022

Taking after are a few impediments in evaluating the brain research of building engineering within the considered area:

1. Shapes based on the past investigation by (Ming-Chyuan Ho, 2021) with participants who came from Taiwan and with building samples taken from China, Taiwan and Japan, it was concluded that buildings with rectilinear patterns can reduce stress more and buildings with curvilinear look attractive but do not reduce stress because information about shapes that are classified as active compared to straight shapes.
2. Colors are separated into three categories: Primary, ruddy, yellow, and blue; Secondary, namely the colors orange, green, and violet; Tertiary, specifically a blend of colors between red-orange, yellow-orange, yellow-green, blue-green, blue-violet, and red-violet (Color Basics, n.d.). Based on the article written by (Gremillion, 2020) psychology of color is divided into several categories, namely:
  - a. Warm colors such as red, yellow, and orange which can increase happiness, optimism, and energy;
  - b. Happy colors are derived from warm colors that have the same effect, such as yellow, orange, red, and pink or other pastel colors related to these colors;
  - c. Cool colors have a relationship with feelings of sadness, namely the colors blue, green and purple;
  - d. Calming colors are color derivatives from cool colors which have a calming effect because they relate to sadness, namely blue and green; while the selection of colors with high lighting levels such as neon, in general, can give the impression of giving energy but with high intensity, it can cause visual discomfort.
3. Ornament, the ornament are divided into three categorize (Britanica, 2009) such as:
  - a. Mimetic/imitative, this ornament is the ornament which is made to describe something as a symbolic form.
  - b. Applied ornament, this ornament are aims to put a touch of beautification of art into the structure

with extrinsic, means no meaning to describe something as a symbolic things.

- c. Organic ornament, means the ornament is built as a structure and is functional for the user or the building itself.

In this research, the data collected of the buildings then grouped as the three category as the ornament group. According to (Johnson, 2019) same as shapes, ornament also are divided onto several form such as: Squares/rectangles, this form is describe a vibes of stability and reliability; Circle/oval, is described about unity and commitment; Triangles, the wide part of triangles is describes about the journey or struggle, and the sharp part is described goal; Lines, are describe about community and serenity (in horizontal) and described strength and aggression (in vertical); Curve, this shape or ornament can describe a happiness; Organic shapes, describe about nature and can be used to show a comfort conditions and spontaneity.

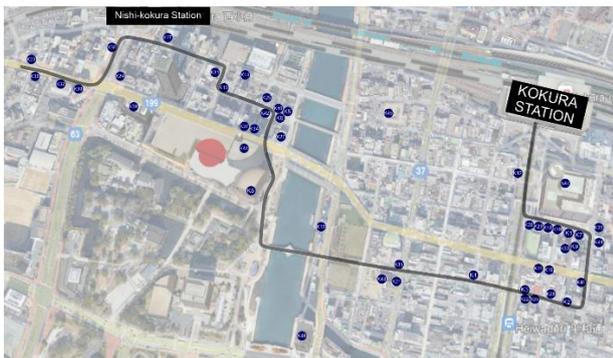
### 3. Findings and Analysis

Information collection within the frame of photographs is taken in several conditions, some of the pictures is taken in the good shoot in vertically of the view and some of them shoot with different angle due to unforeseen conditions during data collection.

#### 3.1 Kokura

Kokura is the downtown range of Kitakyushu, where the most seasoned building in Kitakyushu stands, to be specific Kokura Castle. This range may be a cutting-edge range with tall commerce activity. This zone was chosen since it features an assortment of structural visuals which is one of the criteria in this research.

In common, the buildings in Kokura within the range that was passed amid information collection, see differing with very an assortment of commonplace shapes and the determination of colors and adornments are delicate and not as well garish.



**Figure 3. Data Retrieval Area of Kokura**  
Source: Personal Documentation, 2022

From the photo data obtained, then it is matched against the limits that have been made in assessing the psychology of architecture, as follows:

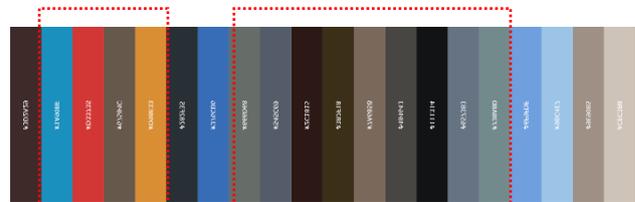
1. Kokura buildings shape  
In terms of shape, all buildings have a shape that is indicated to reduce stress based on their visual form, but for buildings that are categorized as attractive, there are only 10 buildings out of a total of 48

buildings, namely buildings with codes K2, K11, K17, K23, K24, K27, K31, K36, K47, and K48.



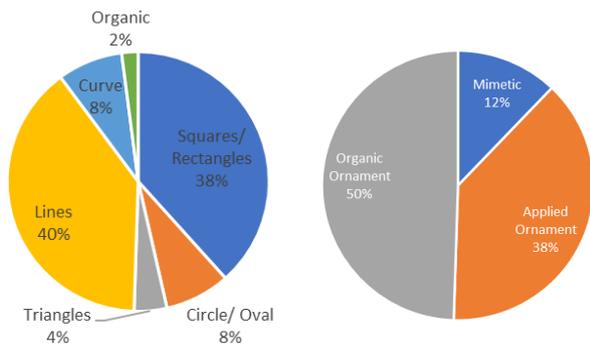
**Figure 4. Kokura Photo Based on Code**  
Source: Personal Documentation, 2022

2. Kokura buildings color  
The following is a complete color list of the forty-eight building drawings. Based on these data, it can be said that buildings in Kokura are generally a mixture of brown and blue in color and have a few touches of a mixture of red and orange. So in the overall assessment, the color of the buildings in Kokura based on the data taken on the road is included in the warm and cool colors, where the brown color has a bigger impact on increasing feelings of optimism, and happiness and the second largest color is blue, which has an impact on feelings soothes especially in sorrow.



**Figure 5. Color Palette of Data Collection Kokura**  
Source: Personal Documentation, 2022

3. Kokura buildings ornament  
Based on the analyzed data, the ornaments applied to buildings in Kokura are generally squares and rectangles with a percentage of 38 percent squares/rectangles ornament, 40 percent lines ornament, and the lowest use of organic ornaments is 2 percent. In percentages based on the type of ornament category, 50 percent fall into the organic ornament category, 38 percent fall into the applied ornament category, and 12 percent fall into the mimetic ornament category (Figure 6).



**Figure 6. Ornament Percentage of Kokura Buildings**  
Source: Personal Documentation, 2022

### 3.2 Mojiko

Mojiko is a critical region in Moji, as a tourism range and a connection between the Kitakyushu area on the island of Kyushu and the Shimonoseki area on Honshu Island. This range was chosen since of the differences of notable architecture in it which is additionally one of the centers of nearby authentic tourism in Kitakyushu, for this reason, this zone includes a tall level of versatility and can be very curiously to consider the psychology of design that influences joy within the tourism circle. The characteristics of the buildings in Mojiko have vibes that take after the concept of Mojiko itself, to be specific Retro with a reasonably thick color choice and the face of the building that looks old.

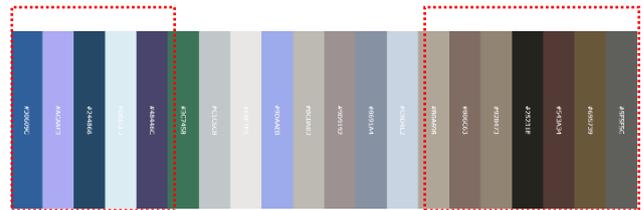
The following is a complete color list of the 53 building drawings. Based on these data, it can be said that buildings in Mojiko are generally a mixture of brown, purple and mixture pastel color of them (Figure 9). The colors used in buildings in the Mojiko area are generally included in the cool colors (purple, green, blue) and warm and happy colors (brown) categories. It can be concluded that the buildings in this area give an uplifting yet lightening impression.



**Figure 8. Mojiko Photo Based on Code**  
Source: Personal Documentation, 2022



**Figure 7. Data Retrieval Area of Mojiko**  
Source: Personal Documentation, 2022



**Figure 9. Color Palette of Data Collection Mojiko**  
Source: Personal Documentation, 2022

From the photo data obtained, then it is matched against the limits that have been made in assessing the psychology of architecture, as follows:

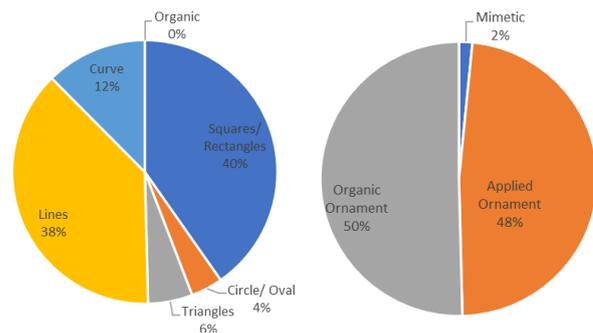
1. Mojiko buildings shape

In terms of shape, all buildings have a shape that is indicated to reduce stress based on their visual form, but for buildings that are categorized as attractive, there are only 13 buildings (Figure 7) out of a total of 53 buildings, namely buildings with codes M11, M14, M25, M26, M29, M31, M36, M41, M42, M44, M45, M46, and M53 (Figure 8).

2. Mojiko buildings colors

3. Mojiko buildings ornament

Based on the analyzed data, the ornaments applied to buildings in Mojiko are generally squares and rectangles with a percentage of 40 percent squares/rectangles ornament, 38 percent lines ornament, and the lowest use of circle/oval ornaments is 4 percent. In percentages based on the type of ornament category, 50 percent fall into the organic ornament category, 48 percent fall into the applied ornament category, and 2 percent fall into the mimetic ornament category (Figure 10).



**Figure 10. Ornament Percentage of Mojiko Buildings**  
Source: Personal Documentation, 2022

### 3.3 Wakamatsu-Tobata

Wakamatsu and Tobata are more categorized into private zones, but this zone is additionally utilized as a tourism zone with the charm of its old buildings and calm seaside tourism. The Wakamatsu-Tobata range was chosen since this region is the range with the foremost elderly individuals in Kitakyushu, making this zone curiously to analyze in terms of psychological architecture.



**Figure 11. Data Retrieval Area of Wakamatsu-Tobata**  
Source: Personal Documentation, 2022



**Figure 12. Wakamatsu-Tobata Photo Based on Code**  
Source: Personal Documentation, 2022

From the photo data obtained (Figure 7), then it is matched against the limits that have been made in assessing the psychology of architecture, as follows:

1. Wakamatsu-Tobata buildings shape  
In terms of shape, all buildings have a shape that is indicated to reduce stress based on their visual form,

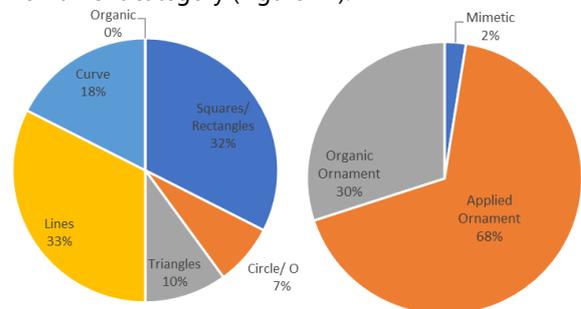
but for buildings that are categorized as attractive, there are only 4 buildings out of a total of 13 buildings in Wakamatsu namely buildings with codes W4, W8, W9, and W13, and also 8 buildings out of a total of 34 buildings in Tobata, namely buildings with codes T3, T14, T22, T23, T24, T29, T32, and T33.

2. Wakamatsu-Tobata buildings color  
Based on 13 buildings in Wakamatsu and 34 buildings in Tobata, the dominant colors in these two areas are categorized as warm colors and happy colors, such as brown, red, and yellow.



**Figure 13. Color Pallet of Data Collection Wakamatsu-Tobata**  
Source: Personal Documentation, 2022

3. Wakamatsu-Tobata buildings ornament  
Based on the analyzed data, the ornaments applied to buildings in Wakamatsu-Tobata are generally squares and rectangles with a percentage of 32 percent squares/rectangles ornament, 33 percent lines ornament, and the lowest use of circle/oval ornaments is 7 percent. In percentages based on the type of ornament category, 30 percent fall into the organic ornament category, 68 percent fall into the applied ornament category, and 2 percent fall into the mimetic ornament category (Figure 14).



**Figure 14. Ornament Percentage of Mojiko Buildings**  
Source: Personal Documentation, 2022

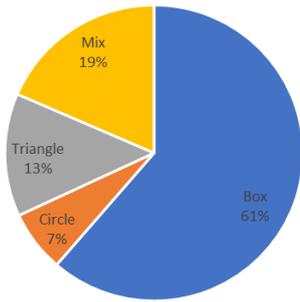
### 4. Results and Discussions

The results of the analysis show that the shape used in the design of the Kitakyushu roadside building or in the selected research area is 61 percent of the building in the form of a box, then followed by a form that is combined with a triangle shape as much as 13 percent and a circle 7 percent (Figure 15).

Squares and triangles can be categorized into firm and sharp forms, but in a research experiment that has been conducted by (Ming-Chyuan Ho, 2021) these shapes can affect psychology as a medium in reducing stress.

From different categories, namely in color selection, buildings located in the research area in Kitakyushu generally apply earth colors, such as black-gray-brown-yellow-red with different color contrasts (Figure 16). Based on the choice of ornament, the buildings in this research area tend to use ornaments of repetition of lines and

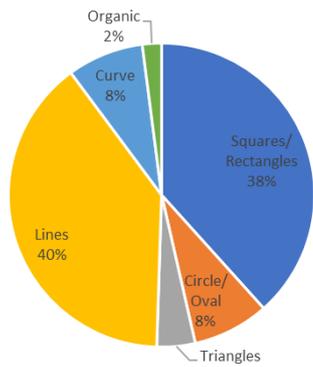
squares (Figure 17). And based on the category, organic ornaments and applied ornaments are mostly applied in building designs in the research area.



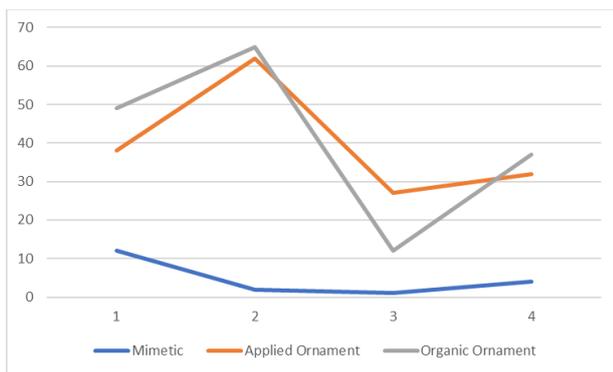
**Figure 15. Overall Percentage Based on Buildings Shapes**  
Source: Personal Documentation, 2022



**Figure 16. Color Palette of Building in All Research Areas**  
Source: Personal Documentation, 2022



**Figure 17. Percentage of Ornament Types Applied**  
Source: Personal Documentation, 2022



**Figure 18. Ornament Application Chart**  
Source: Personal Documentation, 2022

## 5. Conclusion

This research is a basic study for more in-depth research on the psychology of architecture in urban Kitakyushu. This study aims to study the shape, color and ornamentation of buildings scattered in the center of urban growth in Kitakyushu. The results of the analysis of this study are judgmental based on the information collected regarding shapes, colors, and ornaments related to psychology, showing:

1. Buildings in Kitakyushu with shapes that tend to be repetitive in different places, have an effect on stimulating stress reduction.
2. The selected color tone, the overall color seen in each area looks darker and softer, such as black, brown, light blue, to light green, indicating calm and sadness, except for buildings with the function of a restaurant or food shop, using bright and cheerful colors on the building and its ornaments.
3. Similar to shapes, ornaments that are widely used in the three research areas are rectangular and linear shapes with repetitions that have the potential to provide a stress-reducing effect to the viewer. The use of ornaments in this research area is also not only an element of beauty but also functional.

Overall, it can be concluded that the vibes that emanate based on the shape, color and ornamentation on the facade of the roadside building in Kitakyushu look simple and contextual to the environment and are calming but seem warm and sad at the same time.

In this study, there are many shortcomings, especially in assessing the shape, color, and ornament and their impact on the psychology of the environment. Therefore, further research from this research will be very useful in generating design ideas that can build a positive image in the area in Kitakyushu. Subsequent experimental research using interview and questionnaire methods will be able to strengthen the results of this study.

## 6. Acknowledgment

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