Do You Live Happily? Exploring the Impact of Physical Environment on Residents’ Sense of Happiness

Chiu-lin Chen¹ and Heng Zhang¹*

¹Department of Architecture, National Cheng Kung University, No. 1, University Rd.,
Tainan City 701, Taiwan

*changlin@mail.ncku.edu.tw

Abstract. From the beginning of human civilization, human beings have been exploring the source of happiness. Capitalists believed that economic growth would bring us happiness, but a small, poor Buddhist country—Bhutan—has dispelled the myth with the concept of Gross National Happiness. Today, the concept of happiness has evolved from the field of psychology to all disciplines. Many researchers are exploring how environmental psychology/behavioral psychology influences residents’ sense of happiness. The goal of this study is to explore how various environmental factors influence residents’ sense of happiness. Through statistical analysis of 473 samples, the results showed that factors like green area, community layout, aesthetics, transportation service and social service significantly influenced residents’ sense of happiness. Among all the factors, transportation service and social service simultaneously influence “satisfied” and “joyful”, the two factors related to residents’ sense of happiness; community layout and aesthetics are significantly correlated to “satisfied”; green area and business service significantly influences “joyful”. The results of this study can be used as reference for professionals as they make relevant decisions.

1. Introduction
Aristotle pointed out that “Happiness is the meaning and the purpose of life”. However, in the modern society with capitalism as the mainstream, people tend to believe that economic growth will bring us happiness. Gross Domestic Product (GDP) is commonly used in the international community as an important indicator to measure social progress and people’s well-being [1]. This trend changed in 2005 when reports showed that 97% of the people in Bhutan, a small and poor Buddhist country, feel happy, despite the fact that they do not own a lot of material enjoyment. King Jigme Dorji Wangchuck of Bhutan proposed the idea of Gross National Happiness (GNH) in 1972. He indicated the four columns of GNH: sustainable and equitable socio-economic development, conservation of environment, preservation and promotion of culture, and good governance [2].

Similarly, the OECD (Organization for Economic Cooperation and Development), with 34 countries which rely on market economy, published “Your Better Life Index” in 2011 and selected material conditions (such as housing, income and wealth, jobs and earnings) as well as quality of life (such as health status, work-life balance, education and skills, social connections, civic engagement and governance, environmental quality, life satisfaction, personal security, subjective well-being) as indicators of people’s well-being [3]. Public and private sectors in many countries followed the steps of OCED to investigate measurement of happiness and social progress.
Following the world trends, studies of happiness has shifted from pure psychology to environmental psychology/praxeology, environment and spatial governance. Even planners and designers are studying issues related to happiness, including environmental study, environmental quality, housing, landscape, rural regeneration, leisure and recreation…etc. [4-9]. Over the past few years, one can see abundant papers on the relationship between community environment and residents’ sense of happiness. This study explores how physical environmental factors in the community influence residents’ sense of happiness. The results of this study can be used as reference for professionals as they make decision related to housing policies, urban planning and design, architecture, landscape, community management.

2. Methodology

2.1. Research site
This research used five communities in southern Taiwan as samples, including Daan New Village, Yiping Neighborhood Community, Qigu Longshan Community, Hongyi Community and Hongnan Community. The first three are located in Tainan City and the others are located in Kaohsiung City. These communities reflect commonly seen communities in southern Taiwan in terms of the number of residents, level of development, community layout and age of houses. The pictures of five communities are shown in figure 1.

![Figure 1. The pictures of five communities](image)

2.2. Measures and Procedure
The questionnaires were distributed to survey the relationship between individual participant’s sense of happiness and the physical environment of their community. The questionnaires include 10 questions to measure residents’ sense of happiness [10], including questions regarding optimism, social control, positive affect, sense of control, physical fitness, satisfaction with self, mental alertness, and working achievements. In the questionnaires, 48 questions are about physical environmental factors which consist of 11 factors: “green areas”, “community layout”, “architectural scale”, “aesthetics”, “open space”, “street landscape”, “transportation service”, “business service”, “learning service”, “social service” and “recreational service”. The last part of the questionnaire asks participants questions about their demographic characteristics. This study uses Likert-type scale. In the 5-point scales, 1 represents “strongly disagree”, 2 “disagree”, 3 “neutral”, 4 “agree” and 5 “strongly agree”.

With the assistance of the village chiefs and community volunteers, the questionnaires were distributed to 568 residents, using a cluster convenience sampling technique. Considering participants’ comprehension ability, the survey was conducted using self-report and interview. In total, 568 questionnaires were collected and 473 questionnaires are considered valid. The valid return rate was 83.3%.

2.3. Statistical analysis
After collecting the data, SPSS version 22.0 was used to carry out the statistical analysis. Descriptive statistics and item analysis were used to check the consistency among items and among samples, as well as stability of factor structure. Then, EFA (exploratory factor analysis) was conducted to find out the factor structure of residents’ sense of happiness in the neighborhood. At the same time, reliability analysis was conducted to ensure the reliability of each factor. Finally, the multiple linear regression
analysis (stepwise regression) was performed to identify physical environmental factors that significantly predict resident’s happiness.

3. Results

3.1. Social-demographic characteristics of the interviewees

A total of 473 participants were surveyed. The participants’ social-demographic characteristics, including gender, age, education, marital status, home ownership and living duration, are shown in Table 1.

Table 1. Sociodemographic characteristics of the respondents

| Gender            | N   | %   | Marital status               | N   | %   |
|-------------------|-----|-----|------------------------------|-----|-----|
| Male              | 217 | 47.3% | Single                      | 48  | 10.5% |
| Female            | 242 | 52.7% | Married                     | 354 | 77.5% |
|                   |     |      | Widowed                      | 36  | 7.9%  |
|                   |     |      | Divorced or separated        | 18  | 3.9%  |

| Age               | N   | %   | House ownership               | N   | %   |
|-------------------|-----|-----|-------------------------------|-----|-----|
| 20-30             | 24  | 5.1% | Self-owned                   | 286 | 61.1% |
| 31-40             | 52  | 11.0% | Rental                       | 67  | 14.3% |
| 41-50             | 95  | 20.1% | Borrowed                     | 25  | 5.3%  |
| 51-64             | 171 | 36.2% | Dormitory                    | 85  | 18.2% |
| 65-74             | 79  | 16.7% | Other                        | 5   | 1.1%  |
| 75-85             | 47  | 9.9%  |                               |     |      |
| above 85          | 5   | 1.1%  |                               |     |      |

| Education         | N   | %   | Living duration (years)      | N   | %   |
|-------------------|-----|-----|-------------------------------|-----|-----|
| Elementary school or under | 45  | 9.6% | Under 1                      | 25  | 5.3%  |
| Junior high school | 28  | 6.0% | 1-5                          | 88  | 18.6% |
| Senior high school | 166 | 35.3% | 6-10                        | 76  | 16.1% |
| Undergraduate      | 191 | 40.6% | 11-15                       | 87  | 18.4% |
| Graduate           | 40  | 8.5%  | Above 16                     | 197 | 41.6% |

3.2. The factor structure of sense of happiness

The principal component analysis of EFA was used to examine the factor structure of sense of happiness. The eigenvalues were founded of a two-factor solution: “satisfied” factor and “joyful” factor. The eigenvalues of were 4.754 and 1.094, totally explaining 73.106% of variance. The results of factor loading and explained variance are illustrated in Table 2. Then, both factors are used as the criterion variables for the stepwise regression analysis. This result is consistent with Ruut Veenhoven and Mariano Rojas’ theory of happiness and its components [11].

Table 2. The results of EFA about factor structure of the happiness scale.
3.3. The relationship between planned physical environment and residents’ sense of happiness

For the “satisfied” factor, the results of regression analysis shown that “community layout”, “aesthetics”, “transportation service” and “social service” are significant predictors (Table 3). All the afore-mentioned factors positively correlated with the satisfied factor. The explanation power of these predictors are significant: adjusted $R^2 = 0.384$, $F (7, 677) = 74.126$, $p = 0.000 < 0.001$.

As for the “joyful” factor, the model explains that “transportation service”, “green area”, “recreational service” and “business service” to be significantly related with it (Table 3). All have positive power: adjusted $R^2 = 0.407$, $F (3, 987) = 81.337$, $p = 0.000 < 0.001$. The standardized coefficients ($\beta$) display the effect size of predictors of the two regression to vary between small to medium.

The relationship between happiness and “physical environment” dimension can be expressed as the following two equations:

$$\begin{align*}
\text{Happiness: Satisfied factor} & = 1.531 + 0.205 \text{ social service} + 0.138 \text{ community layout} \\
& + 0.158 \text{ transportation service} + 0.114 \text{ aesthetics} \\
\text{Happiness: Joyful factor} & = 1.184 + 0.181 \text{ transportation service} + 0.211 \text{ green area} \\
& + 0.188 \text{ recreational service} + 0.091 \text{ business service}
\end{align*}$$

According to the equations above, the effects of physical environment on residents’ sense of happiness can be observed. Generally speaking, residents’ sense of happiness is simultaneously influenced by the planning and design of the physical environment of the community and the services available at the community. The effect of community services on satisfied factor and joyful factor is medium, but stronger than physical environment factor. Although green area is a primary factor that influences joyful factor, but other community services factors, such as transportation service, business service, and social service also have only low to medium effect on joyful factor. Among them, transportation service and social service have significant influence on satisfied and joyful factors. Furthermore, compared with transportation service, the effect of social service to both factors is medium.

Table 3. Predictors of the happiness factors

|                      | B    | SEB  | $\beta$ | t     | VIF |
|----------------------|------|------|---------|-------|-----|
| Dependent variable: “satisfied” factor |      |      |         |       |     |
| Constant             | 1.531| .140 | 1.095***| 10.951|     |
| social service       | .205 | .038 | .267    | 5.425***| 1.850|
| community layout     | .138 | .054 | .147    | 2.547* | 2.531|
| transportation service| .158 | .044 | .189    | 3.581***| 2.118|
| aesthetics           | .114 | .041 | .148    | 2.771**| 2.183|
| Dependent variable: “joyful” factor |      |      |         |       |     |
| Constant             | 1.184| .157 | 7.525***| 7.525***|     |
| transportation service| .181 | .041 | .223    | 4.460***| 1.968|
| green area           | .211 | .037 | .256    | 5.683***| 1.598|
| recreational service | .188 | .045 | .216    | 4.207***| 2.084|
| business service     | .091 | .045 | .091    | 1.997* | 1.646|

*= p < 0.05  **= p < 0.01  ***p = < 0.001

4. Conclusion

This study showed how various of physical environment factors within the community influence residents’ sense of happiness and explored improvement of which physical environment factors can improve residents’ sense of happiness. Other researchers have found that residents recognize the fact that the quality of the living environment can be divided into spatial, functional and contextual factors [12-13]. This study further discovered that some physical environmental factors, including planning and design of the physical environment, and community services influence residents’ sense of
happiness with varying significance. The study done by Asiyeh S. in 2017 on Iranian young women about the relationship between the living environment, well-being and lifestyle behaviors has found that, in addition to psychological environment, negative appearances in the physical community environment have negative impact on women’s sense of well-being and satisfaction rate of their living environment [14]. The results of this study echoed that of Asiyeh S. This study found that green area, community layout, aesthetics, transportation service, social service, among the other physical environment factors, have significant effect on residents’ sense of happiness. Among them, transportation service and social service simultaneously influence “satisfied” and “joyful” factors; community layout and aesthetics have positive correlations with “satisfied” factor; green area and business service significantly influences “joyful” factor.

Numerous studies have shown that green area in a community is correlated to residents’ sense of happiness8 [15-18]. This study further found that the size of green area and accessibility of the green area, the size of the trees and the landscaping, are positively correlated with “joyful” factor. Criminologists often argue that community layout is an important element of community safety. Studies have shown that community layout is directly or indirectly correlated to residents’ sense of well-being. Relevant research showed that the design of street networks, particularly the permeability of community layout is key to residents’ health and well-being [18-19]. In addition, this study also found that aesthetics of architecture and outdoor space in the community is key to create residents’ sense of happiness and it has positive correlation with “satisfied” factor. In other words, residents living a beautiful community tend to have higher sense of happiness. Many studies have found that in nursing homes, rural areas or poor areas, the aesthetics of exterior space in the community or interior space inside the houses are significantly correlated to residents’ sense of happiness. [20-22]. Transportation service is significantly correlated to “satisfied” and “joyful” factors, the two factors that show sense of happiness. Other studies have proven that when residents live closer to the busy roads, their sense of happiness will be lower. In addition, traffic congestion will definitely lower residents’ sense of happiness [23-24].

The results of this study can be used as a reference for governments to make housing policies. Professionals can also use the findings of this study as reference as they implement urban planning, architecture design and landscape design to create happy communities. Future researchers can also use the results of this study as the foundation to conduct more research on conditions related to happy and livable environment.

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