

# EFFECTS OF THE ELEVATION OF RAILWAY ROAD ON THE RESIDENTIAL ENVIRONMENT AND THE PROFILE OF MOOD STATES OF THE NEIGHBORING RESIDENTS

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## Abstract

Effects of the elevation of railway road for 4.9 km in Osaka on the living environment of the neighboring residents were investigated by subjective evaluation. The profiles of mood states were also considered. Results: 1) "Not crowded", "Remarkable", "Good", "Comfortable", "Effective", "Beautiful", "Free", "Bright", "Artificial", "Urban", "New", "Maintained" and "Clean" were the impressions of the railway elevation. 2) Many residents thought the elevation "Necessary", "Good for environment", and "Decreasing the congestion". Actually, 70% of the respondents approved the elevation. 3) "Sunshine" and "Ventilation" of the dwellings, "Natural environment" of the region and "Favor to the region" are related to the evaluation of the elevation. 4) Anger- hostility (POMS A-H), Vigor (POMS V), and Fatigue (POMS F) were also related to the evaluation. 5) Sex, age, living floor space, and means of daily transportation were not related to the evaluation.

## 1. Introduction

Railways in Japan play a central role for passengers and bulk shipments as a basic means of conveyance by land. The JR Hanwa Line abolished a railroad crossing and made an approximately 4.9 km elevated bridge section. This study shows the influence on living environmental evaluation of the resident in the surrounding by this elevated bridge, and clarifies residents' impressions. Moreover, the realities of consideration to the elevated bridge of the resident in the surrounding in the city are understood by clarifying the relation between the living environment and the impression evaluation and the relations between POMS and the impression evaluation. Furthermore, the relation between the living environmental evaluation and POMS is considered; it is intended for contributing helpful information when the elevated bridge of the future is designed and operated.

The impression evaluation uses the SD method. The Profile of Mood States (POMS) evaluation is an attitude profile inspection used in the clinical psychology field.

## 2. Method

### 2.1 Investigation Object

The object houses were of five districts centered on Minami-tanabe Station of the JR Hanwa Line, Tsurugaoka Station, Nagai Station, Abiko-cho Station, and Sugimoto-cho Station, and in the range as shown in the fourth both sides of east and west from JR Hanwa Line elevated bridge. In all, 1900 households were selected randomly, with almost the same ratio of detached houses and the housing complexes from among them, and the living environment was investigated for the residents.

The investigation survey was done by posting to the post of a local each unit, and divided into two times on Saturday, October 13 and October 20, 2007. The investigation survey was returned by mail before the deadline of October 31, 2007. The collected forms were 296; the collection rate was 15.6%.

## 2.2 Investigation Items

Investigation items were of three categories: 1) attributes of the respondent (sex, age, occupation, transportation, etc.), unit (dwelling form, living space, elevated view, amount of living floor space, window azimuths, residence years, etc.), and living environment evaluation (sunshine, ventilation, natural environment, public transport, favorability of the region, etc.) were 28 items in all; 2) the impressions about and evaluation of the elevated bridge was investigated using SD method: 46 items. (The main impression items were 35: Crowded  $\Leftrightarrow$  Not crowded, Remarkable  $\Leftrightarrow$  Unremarkable, Good  $\Leftrightarrow$  Bad, Comfortable  $\Leftrightarrow$  Uncomfortable, Effective  $\Leftrightarrow$  Useless, Beautiful  $\Leftrightarrow$  Dirty, Free  $\Leftrightarrow$  Oppressive, Bright  $\Leftrightarrow$  Dark, Natural  $\Leftrightarrow$  Artificial, Country  $\Leftrightarrow$  Urban, New  $\Leftrightarrow$  Old, Maintained  $\Leftrightarrow$  Unfinished, Clean  $\Leftrightarrow$  Unclean.) Additionally, Surroundings are dark at night  $\Leftrightarrow$  Surroundings are bright at night, Elevated rails are necessary for the city  $\Leftrightarrow$  Elevated rails are unnecessary in the city, Elevated rails are good for the environment  $\Leftrightarrow$  Elevated rails are bad for the environment, Congestion has increased in elevated rail areas  $\Leftrightarrow$  Congestion has decreased in elevated rail areas, You might make it elevated  $\Leftrightarrow$  You should not make it elevated, 11 items. 3) Finally, 40 items were quoted from evaluation item POMS to express feelings related to the elevated bridge. Six feelings standards (Tension-Anxiety (POMS T-A), Depression-Dejection (POMS D), Anger-Hostility (POMS A-H), Vigor (POMS V), Fatigue (POMS F), and Confusion (POMS C)) were measured using a Likert scale with choices from "Not at all" (0 points) to "Quite a lot" (four points).

## 3. Results and Consideration

### 3.1 Result of Impression Evaluation

For evaluation of natural environment, people who answered, "Usually", "A little bad", and "It is bad" were most numerous. Traffic convenience and shopping convenience were both highly appraised. There were many respondents who expressed "Usually" and "Favor a little" regarding favorability to the region of living (76%).

In the impression evaluation of the elevated bridge, the answer was biased to the side of "Did not crowd", "Stands out", "Good", "Comfortable", "Effective", "Beautiful", "Openhearted", "Bright", "Artificial", "City", "New", "Maintained", and "Clean". The only negative impression was "Surroundings are dark at night" (44%).

### 3.2 Score Result of Feelings Evaluation

This study investigated the trend by the presence of the total score of each feelings standard. The rate whose total of number (255–264) of valid responses is 0 points is high in each standard. Fatigue (F) has many 0 points (62.1%). Next is Anger-Hostility (A-H) (54.8%), then Depression-Dejection (D) (39.5%), and Vigor (V) (32.9%) that 0 points were 40 percent of the whole from 30 percent. Confusion (C) (2.3%), and Tension-Anxiety (T-A) (1.5%) were a few percent (Table 1).

**Table 1:** Average point of feelings evaluation and ratio in 0 points

	Average point	The highest point	Full marks	Ratio in 0 points (%)
POMS T-A	7.3	36	36	1.5
POMS D	2.8	20	24	39.5
POMS A-H	3.3	24	24	54.8
POMS V	4.8	28	28	32.9
POMS F	2.7	24	24	62.1
POMS C	5.3	20	20	2.3

### 3.3 Comparison by Answer Attributes, Unit Attributes, and Living Environmental Evaluation

Respondents who answered attributes (ten items) and units for the investigation (ten items) and living environmental evaluations (six items) were divided into two categories: those giving positive responses "It was good" ("It was good", "It is a little good", and "Usually") and those giving negative responses "It is bad" ("It was a little bad" and "It is bad."). The SD evaluations in the elevated bridge were compared.

There was a difference related to the classification by the following living environmental evaluation items. "Sunshine", "Ventilation", "Evaluation of natural environment" and "Favorability of region." Especially, it became clear that persons for whom "Evaluation of natural environment" feels "It is bad" is "Artificial", is "It is ordinary", is "Do not feel relieved", is "It is not relieved", etc. and catches the elevated bridge compared with the person who feels, "It is good". It is thought that a living environmental evaluation is a factor that influences the impression evaluation in the elevated bridge.

On the other hand, for respondents answering "How to see the elevated bridge", "Direction of the window of the living room", "Use of a private car", "Traffic convenience", and "Convenience of shopping" show no difference, implying that the respondents' unit form is not a factor that influences the impression of the elevated bridge. Figures 1 and 2 show a profile of the items exhibiting a great difference.

### 3.4 Comparison by Feelings Evaluation

The relation to the SD evaluation (35 items) in the elevated bridge was examined using the total score of each feelings standard. Scores of the feelings standard were compared separately for two categories 0 points and any more. The items with a great difference were Anger- Hostility (POMS A-H), Vigor (POMS V), and Fatigue (POMS F); the profiles are shown in Figs. 3–5.

POMS A–H are "It is on my mind", "It is ill-considered", "It is irritating", "It makes me angry", "It is secretly awful and provoking", and "Violent anger is felt." The group for whom this score exists is looking the elevated bridge as an "Eyesore", "Do not feel relieved", "It is not relieved", and "It is busy", etc. compared to the group with 0 points.

POMS V are standards such as "Cheerful feelings" and "Vigor is full", and the group in 0 points does not feel relieved, is not relieved, and is looking the elevated bridge as busy.

POMS F are standards such as "Became tired" and "It is sluggish"; the group for which the score existed is looking the elevated bridge as an "Eyesore", "Do not feel relieved", "It is not relieved", and "It is busy", etc. compared with the group in 0 points.

From the tendencies shown by those responses, it is inferred that feelings are factors that influence the impression evaluation in the elevated bridge.

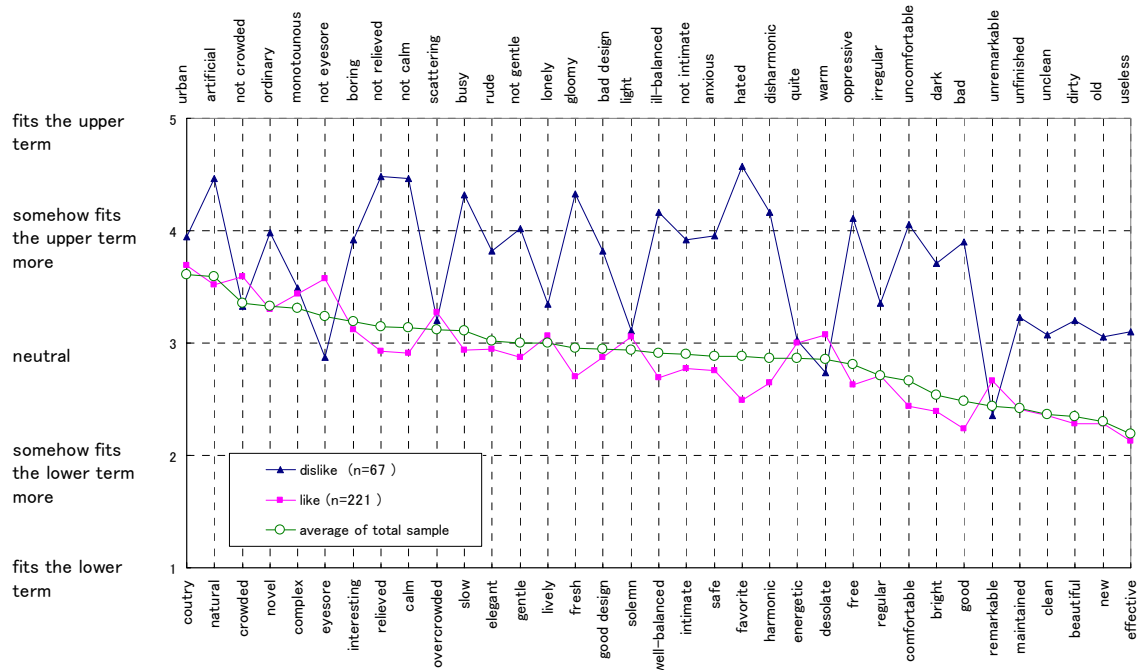


Figure 1: Favorability of the region

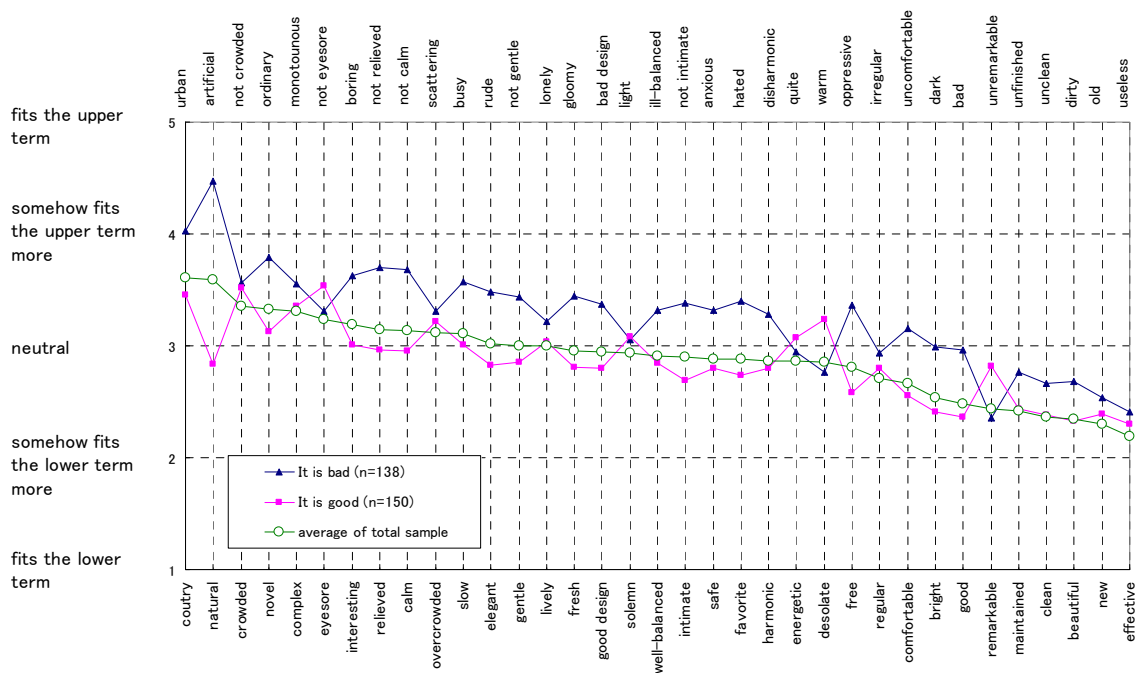
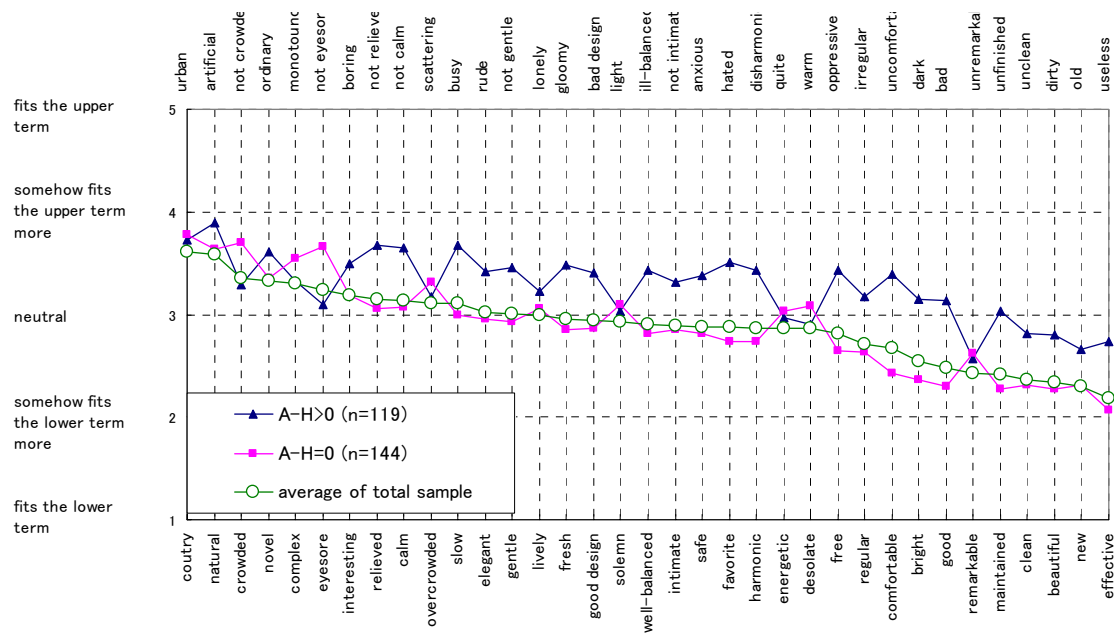
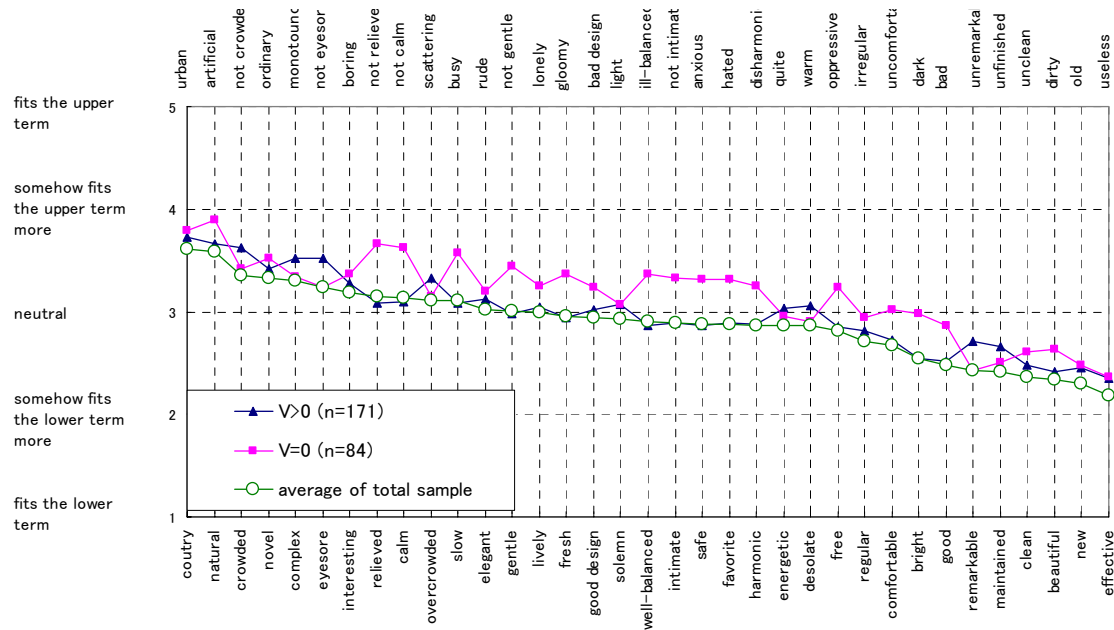


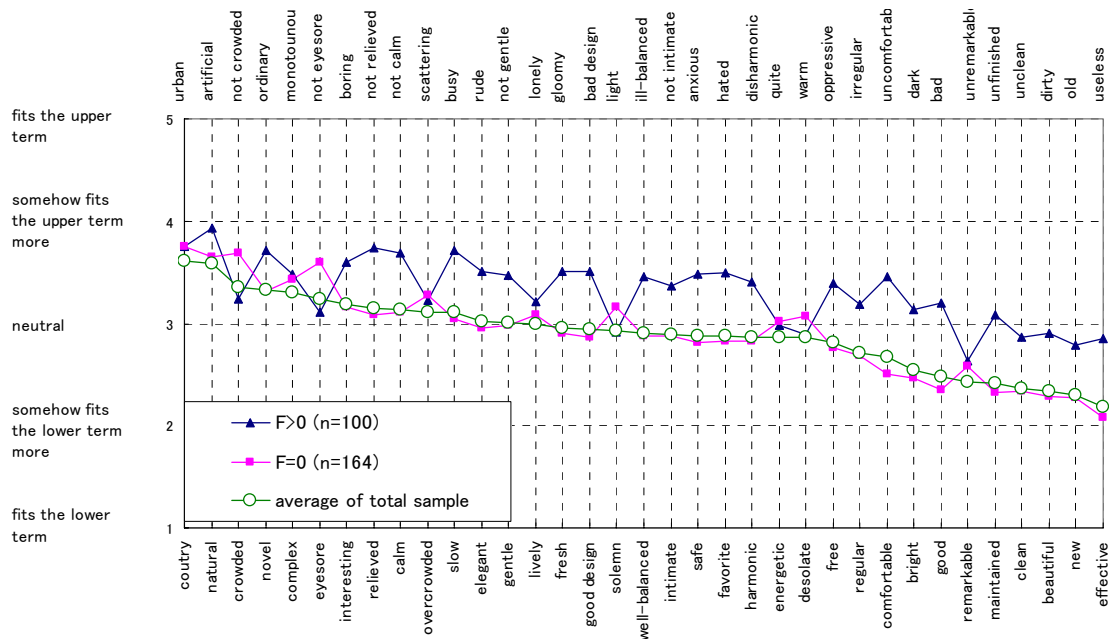
Figure 2: Evaluation of natural environment



**Figure 3:** It relates to the impression evaluation POMS A-H and the elevated bridge



**Figure 4:** It relates to the impression evaluation POMS V and the elevated bridge



**Figure 5:** It relates to the impression evaluation POMS F and the elevated bridge

#### 4. Conclusions

An investigation survey of neighbors' impressions of the Hanwa Line elevated bridge, which was elevated in recent years, was distributed; about 300 residents in the surrounding area responded.

- 1) In all, 13 items were applied to the impression in the elevated bridge: "Not crowded", "Remarkable", "Good", "Comfortable", "Effective", "Beauty", "Free", "Bright", "Artificial", "Urban", "New", "Maintained", and "Clean".
- 2) Regarding the elevated bridge, many residents who thought, "Necessary for the city" (74%), "It is good for the environment" (39%), and "Congestion is decreased" (76%), and the answer "You might make it elevated" were 70%. It can be said that the residents in the surrounding areas are evaluating making it elevated from 1), 2) well above.
- 3) The impression evaluation of the elevated bridge was positive, with common impressions "Sunshine", "Ventilation", "Evaluation of natural environment", "Favorability of the region".
- 4) It relates to the impression evaluation in anger- hostility (POMS A-H), vigor (POMS V), Fatigue (POMS F), and the elevated bridge. It is thought that feelings influence the impression evaluation of the elevated bridge.
- 5) Regarding sex, age, amount of living space, transportation, etc., no relation to the impression evaluation in the elevated bridge was found.

#### References

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