



Impressions of sounds in rural nature area: Comparison between university students in urban area and in rural area

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ABSTRACT

Impressions of university students regarding sounds in rural nature area were investigated using a questionnaire survey and three experiments. In the questionnaire survey, urban university student participants were asked to identify sounds that made them feel comfortable, sounds that made them feel uncomfortable, and sounds that reminded them of nature. Many participants responded that the sounds of nature were comfortable, various noises were uncomfortable, and that sounds of wind, rain, streams, and birdsongs reminded them of nature. The results of the survey suggest that natural sounds in rural nature area are comfortable. In the first experiment, urban university student participants rated their impressions of sounds heard in the rural nature area. Their ratings varied, but many found certain sounds to be nostalgic. In the second experiment, urban university student participants rated their impressions of landscapes they imagined for the same sounds as in the first experiment. Their ratings varied, but many participants also rated some of the imagined landscapes as being nostalgic. In the third experiment, university student participants living in rural nature area similarly rated their impressions of the sounds and imagined landscapes of previous experiments. Both ratings were rather weak, and the response patterns were similar between the sounds and the imagined landscapes. This result suggests that familiarity with sounds may weaken one's impression of them, as well as those of imagined landscapes inspired by these sounds.

INTRODUCTION

The soundscape means the sound environment or acoustic environment, and it was proposed against landscape (Murray Schafer, 1977). Previous researches indicated that sounds or music affected one's cognition for landscapes (Anderson, Mulligan, Goodman & Regen, 1983; Iwamiya, 1997; 2001; Iwamiya, Hosono & Fukuda, 1992; Iwamiya, Makino, & Maeda, 1999; Yamasaki & Yamada, 2007) and landscapes affected one's perception for sounds reversely (Miyakawa, Suzuki, Aono & Takagi, 2000; Tamura, Suzuki & Kashima, 1992). Therefore we should take environmental sounds into consideration when discussing about landscapes.

However in many cases we do not direct our attentions to sound environment where there are few noise problems. The purpose of this study was to investigate impressions of sounds in rural nature area having few noise problems and to suggest characteristics of them. Furthermore we compared impressions of sounds for university students in urban area with those for university students in rural nature area to examine effects of familiarity with sounds on impressions of sounds.

QUESTIONNAIRE RESEARCH

In this study we explored kinds of sounds that people felt to be comfortable or uncomfortable, and kinds of sounds regarded as natural sounds.

Method

Participants were 98 female, 92 male, and 1 unidentified university students ranging in age from 18 to 33 years ($M = 19.60$). They were asked to indicate sounds that made them felt comfortable or uncomfortable in daily lives and to identify each place where they heard those sounds by a questionnaire. They were also asked to indicate sounds that they considered to be natural. Participants could write sounds up to 5 on each question.

Results and Discussion

The total number of the answers for comfortable sounds was 609. The answers included the sounds of birdsongs (11.27%), wind (8.17%), leaves (8.01%), rain (6.70%), and streams (6.54%). Most of them were sounds that we could hear in natural environment. Participants answered that they heard many of them inside their houses or in outdoor places with natural environment.

The total number of the answers for uncomfortable sounds was 629. The answers included human voices (17.08%), noise of car (7.08%), noise of motorcycle (6.46%), noise of scratching on blackboard (6.00%), and noise of construction (4.92%). Most of them were sounds that we regarded as noises. Participants answered that they heard many of them indoors except for their houses or outdoor places without natural environment.

The total number of the answers for natural sounds was 682. The answers included the sounds of wind (16.27%), leaves (12.02%), streams (10.56%), birdsongs (10.41%), and rain (9.38%). Many of the answers were consistent with the sounds that participants felt comfortable.

The result suggested that the comfortable sound included many of sounds heard in rural nature area and the uncomfortable sound included few of sounds heard in rural nature area.

EXPERIMENT 1

In the first experiment we investigated impressions of sounds in rural nature area to urban university students.

Method

Participants were 47 female, 13 male, and 1 unidentified urban university students ranging in age from 20 to 38 years ($M = 21.27$). They were presented 10 sounds (from S1 to S10) recorded in rural nature area and asked to rate each impression on a seven-point semantic-differential scale. The total items of the scale were 17 that were used by Iwamiya et al. (1992). Each stimulus was 30s long.

Results and Discussion

More than one participant could not hear three stimuli (S3, S7 and S8) and we excluded them from the following analysis. The sounds of S1 included voice of a cicada and the sounds of S2 included voice of different kind of a cicada from S1. S4 included sound of cawing of a crow and S5 included sound of a stream. The sounds of S6 included a bell in a temple and the sounds of S9 included different stream from S5. S10 included the sounds of a river.

Exploratory principal axes factor analysis and promax rotation were completed on the ratings of the impressions for 7 stimuli. Four factors were yielded and factors 1, 2, 3, and 4 named Calmness, Activity, Uniqueness, and Nostalgia, respectively. Then each average score of the items that had high factor loadings was regarded as scores of Calmness, Activity, Uniqueness, and Nostalgia. As shown at Figure 1, the scores of Activity and Nostalgia were high on S1 and S2, and that of Calmness and Nostalgia were high on S5. On S6 Calmness, Uniqueness and Nostalgia were high. However, neither scores of S4, of S9 nor of S10 were relatively so high.

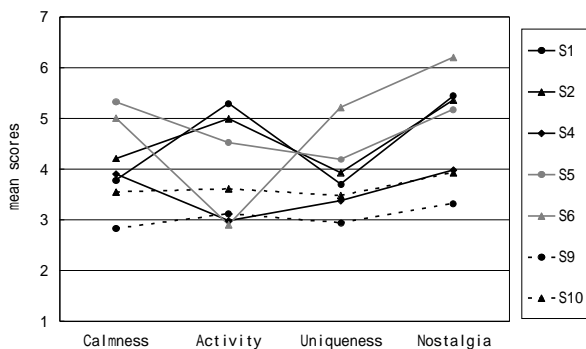


Figure 1. Mean scores of the impressions of the sounds on urban university students

The result indicated that some of the sounds in rural nature area had various aspects as Calmness, Activity, Uniqueness or Nostalgia. It also suggested that Nostalgia might be one of the characteristics of sounds in rural nature area because this factor was not appeared in the previous study (Iwamiya et al., 1992).

EXPERIMENT 2

In the second experiment we examined impressions of landscapes imagined for the same sounds as in the first experiment to urban university students.

Method

Participants were 27 female and 4 male urban university students ranging in age from 19 to 22 years ($M = 20.03$). They were presented 10 sounds (from S1 to S10) and asked to rate each impression of landscapes imagined for the sounds on seven-point semantic-differential scale. The total items of the scale were 18 that were used by Iwamiya et al. (1992). Each stimulus and the procedure were identical with those used in Experiment 1.

Results and Discussion

More than one participant could not hear three stimuli (S3, S7 and S8) that were the same ones in Experiment 1. We excluded them from the following analysis as in Experiment 1.

Exploratory principal axes factor analysis and promax rotation were completed on the ratings of the impressions for 7 stimuli. Four factors were yielded and factors 1, 2, 3, and 4 named Activity, Comfort, Nostalgia, and Uniqueness respectively. Then each average score of the items that had high factor loadings was regarded as scores of Activity, Comfort, Nostalgia, and Uniqueness. As shown at Figure 2, the scores of Activity and Nostalgia were high on S1 and S2, and that of Comfort was high on both S4 and S5. On S6 the scores of Comfort and Nostalgia were high. However neither the scores of S9 nor of S10 were high, and the scores of Uniqueness on S1, S2, S4, S5, S9, and S10 were relatively low.

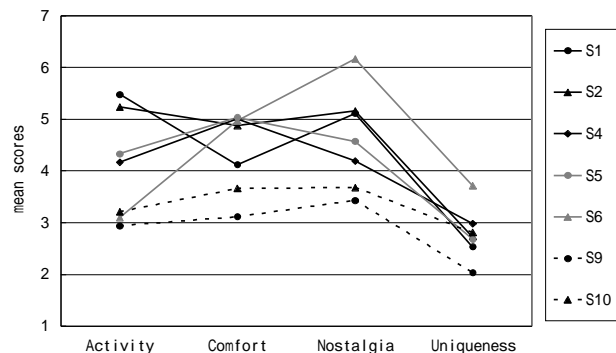


Figure 2. Mean scores of the impressions of the landscapes imagined for the sounds on urban university students

The result indicated that the impressions of the landscapes for the sounds in rural nature area were similar to the impressions of the sounds in Experiment 1. It also suggested that participants imagined the nostalgic landscapes for some sounds.

EXPERIMENT 3

In the third experiment we investigated both impressions of sounds in rural nature area and impressions of landscapes imagined for the sounds to university students living in rural area to examine effects of familiarity with sounds on those impressions.

Method

Participants were 16 female and 14 male university students living in rural nature area ranging in age from 19 to 36 years ($M = 22.43$). They were presented 10 sounds (from S1 to

S10) and asked to rate each impression on same scale as in Experiment 1. Following rating of impressions of sounds they were presented same 10 sounds and asked to rate impressions imagined for each sound on same scale as in Experiment 2. Each stimulus and the procedure were also identical with those used in Experiment 1 and 2.

Results and Discussion

1) Impression of sounds

Exploratory principal axes factor analysis and promax rotation were completed on the ratings of the impressions for 10 stimuli. Four factors were yielded and factors 1, 2, 3, and 4 named Activity, Comfort, Uniqueness, and Nostalgia, respectively. Then each average score of the items that had high factor loadings was regarded as scores of Activity, Comfort, Uniqueness, and Nostalgia. As shown at Figure 3, on each factor almost the scores were not high and were similar among 10 sounds. Besides the patterns of the scores of 4 factors were also similar among 10 sounds.

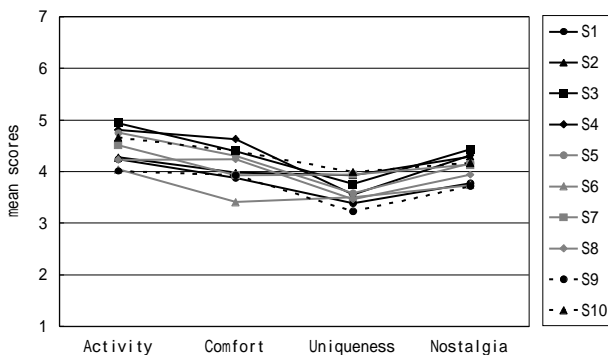


Figure 3. Mean scores of the impressions of the sounds on rural university students

2) Impression of landscapes imagined for sounds

Exploratory principal axes factor analysis and promax rotation were completed on the ratings of the impressions for 10 stimuli. Four factors were yielded and factors 1, 2, 3, and 4 named Activity, Comfort, Nostalgia, and Uniqueness, respectively. Then each average score of the items that had high factor loadings was regarded as scores of Activity, Comfort, Nostalgia, and Uniqueness. As shown at Figure 4, on each factor almost the scores were not high and were similar among 10 sounds as well as the impressions of the sounds. Also the patterns of the scores of 4 factors were similar among 10 sounds.

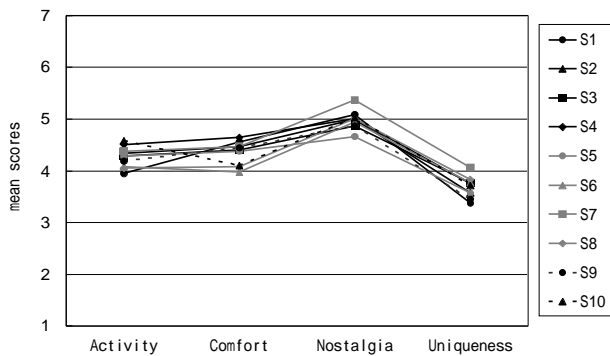


Figure 4. Mean scores of the impressions of the landscapes imagined for the sounds on rural university students

The results indicated that even if the kind of sounds were different, university students living in rural nature had almost

similar impressions of the sounds and almost similar impressions of the landscapes imagined for the sounds.

CONCLUSION

The result suggested that sounds in rural nature area had many comfortable sounds and few uncomfortable sounds. One of the characteristics of the sounds in rural nature area was nostalgia and this might be different from characteristics of sounds in urban area. It also suggested that familiarity with sounds might weaken one's impressions of them, as well as those of imagined landscapes inspired by the sounds.

ACKNOWLEDGEMENT

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REFERENCES

Anderson, L.M., Mulligan, B.E., Goodman, L.S., & Regen, H. Z. (1983). Effects of sounds on preferences for outdoor settings. *Environment and Behavior*, 15, 539-566.

Iwamiya, S. (1997). Interaction between auditory and visual processing in car audio: Simulation experiment using video reproduction. *Applied Human Science*, 16, 115-119.

Iwamiya, S. (2001). Interaction between sound and landscape. *Japanese Journal of Environment Management*, 37, 563-568.

Iwamiya, S., Hosono, H., & Fukuda, K. (1992). Interaction between acoustic environment and landscape: The effect of Acoustic environment on perceived landscapes and the effect of landscape on perceived acoustics environment. *Japanese Journal of Physiological Anthropology*, 11, 51-59.

Iwamiya, S., Makino, T. & Maeda, K. (1999). The effects of background music on the impression of shopping spaces of a supermarket: Simulation experiment using video reproduction. *SOUNDSCAPE*, 1, 107-112.

Miyakawa, M., Suzuki, S., Aono, S. & Takagi, K. (2000). The effects of visual information on the impressions of environmental sounds. *Journal of the Acoustical Society of Japan*, 56, 427-436.

Murray Schafer, R. (1977). *The tuning of the world*. New York: Alfred A. Knopf.

Tamura, A, Suzuki, H. & Kashima, N. (1992). Annoyance of relief by planting belts. *Journal of the Acoustical Society of Japan*, 48, 776-785.

Yamasaki, A. & Yamada, K. (2007). The effects of music on impression of environment. *Proceeding of the 71st annual meeting of the Japanese Psychological Association*, 710.