

What kinds of sounds can elders affected by dementia recollect? : Toward soundscape design

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¹Nagahata, Koji; ²Fukushima, Tetsuhito; ³Ishibashi, Noriko; ⁴Takahashi, Yukio;

⁵Moriyama, Masaki

¹Fukushima University

Kanayagawa 1, Fukushima, 960-1296, JAPAN

Tel: +81-24-548-5154

Fax: +81-24-548-5154

E-mail: nagahata@ads.fukushima-u.ac.jp

^{2,5}Fukuoka University

Nanakuma 7-45-1, Johnan-ku, Fukuoka, 814-0180, JAPAN

Tel: +81-92-801-1011

Fax: +81-92-863-8892

E-mail: ²t-fuku@fukuoka-u.ac.jp, ⁵masakim@fukuoka-u.ac.jp

^{3,4}Esplor Izumo Clinic

Oyama-machi 361-2, Izumo, 693-0051, JAPAN

Tel: +81-853-21-9779

Fax: +81-853-21-9780

E-mail: espoir-izmo@smn.enjoy.ne.jp

ABSTRACT

In this study, an investigation is performed to determine what kinds of sounds are recollected by elderly people affected by dementia, as a first step towards improving sound environments around them. Onomatopoeias are presented to the elderly to stimulate the recollection of sounds, and the subjects are asked to describe them in each case.

The results show that subjects can recollect sounds which had once played important parts in their lives. These sounds in themselves were not uncommon in their daily lives. The results suggest the importance of soundscape design in our daily lives, and emphasize that background music must also be considered as part of soundscape designs.

INTRODUCTION

Sound environment is an important element of our living environment. When we discuss improving living environments for people affected by dementia, we must not ignore soundscape design for them.

Here is an example. According to a note written by a woman affected by dementia [1], it is very difficult for her to know what a sound actually is when she hears it, and it often takes some time to process it. She also writes that sounds are very unfamiliar, strange, and stressful for her until she realizes what they are. This suggests that if certain sounds cannot be recalled easily, the elimination of these sounds would produce a better acoustic environment for them. The elimination of these sounds is one of key functions of soundscape design. To eliminate these kinds of sounds, it is necessary to establish what kinds of sounds are recollected easily.

In this study, the kinds of sounds that are recollected easily by subjects are investigated from the viewpoint of soundscape design as a first step to improving sound environments for them.

The concept of soundscape design is proposed by R. Murray Schafer [2]. This concept is explained as follows.

A new interdiscipline combining the talents of scientists, social scientists and artists (particularly musicians). Soundscape design attempts to discover principles and to develop techniques by which the social, psychological and aesthetic quality of the acoustic environment or SOUNDSCAPE may be improved [3].

This concept aims at producing a soundscape in which all elements are designed to balance well with each other.

SUBJECTS AND METHODS

Subjects The subjects in this study are fourteen elderly people with dementia who are members of a day-care facility in Izumo City, "Oyama-no-ouchi". Group psychotherapy is offered in "Oyama-no-ouchi" daily for regular attendants [4]. The elderly people suffer from medium to advanced degrees of dementia.

Method of The Investigation The investigation is carried out as a part of a course on group care at "Oyama-no-ouchi". The outline of our investigation is shown below.

The subjects and care staff sit in a room as they like, but face a care leader. The care leader shows them a large card on which an onomatopoeic word is written. The onomatopoeias used for our investigation are listed in Table 1. The subjects and care staff read the onomatopoeia aloud several times to help the subjects imagine what kind of sound the onomatopoeia indicates. Sometimes subjects talk with neighbors to help each other recollect what the onomatopoeia signifies. Subjects then describe what they imagine and may answer individually or in-groups, as they see fit. The care leader and other staff respond to subjects' descriptions to further stimulate their recollection. Fig. 1 shows the process used in the investigation.

Table 1. List of onomatopoeias

kaaan, kasha, kasha-kasha, kata-kata, kachi, kachi-kachi, kachi-kochi, pachi-pachi, kotsu-kotsu-kotsu, tone-tone, zah-zah, piyo-piyo, moe, pee-hyala, poto-poto, boon, reen-reen, zabun, cha-reen, geeko-geeko, dosoon-dosoon, sheen, zee, zaa
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Fig. 1 The process used in our investigation

Reasons for Using Onomatopoeias Onomatopoeias were employed for two main reasons.

The first is that each onomatopoeia, as Osaka suggests, expresses a certain realistic soundscape image with a connection between each onomatopoeia and a particular sound [5]. Therefore, if a person can recall a certain sound from an onomatopoeia, it means that he/she has a lasting memory of the sound.

The second reason is that an actual sound (or a recorded sound) often differs from the sound in seniors' memories. In fact, some subjects pointed out differences between some actual sounds and the sounds in their memories when they listened to recorded sounds in our preinvestigation. However, the connection between onomatopoeias and sounds do not seem to change unless subjects had forgotten a certain onomatopoeia entirely. Connections between onomatopoeias and actually remembered sounds were very clear.

Questionnaire to Subjects' Families An inquiry into the relationships between the subjects and sounds was also conducted with help from families. The questionnaire consists of three questions shown in Table 2.

Table 2. Questionnaire to the families of the subjects

1.	Please describe any episodes that show the subject pays particular attention to certain sounds from his/her daily life.
2.	Please describe any examples that show the subject is deeply interested in a certain sound.
3.	Please comment freely on the relation between the subject and sounds in the life of this person, if any.

RESULTS

Responses to Onomatopoeias based on Sounds in Nature Many subjects, regardless of sex, reacted by making various gestures or more often talking with neighbors about "zah-zah", "piyo-piyo", "moe", and "boon". Moreover, replies to these onomatopoeias were made comparatively quicker than replies to other onomatopoeias.

In Japanese, the above onomatopoeias indicate the sounds of nature: "zah-zah" represents the sound of a waterfall or rain; "piyo-piyo" the peeping of chicks; "moe" the sound of cow; and "boon" represents buzzing of bees or mosquitoes. These results show that the sounds of nature are recollected easily.

Izumo City and towns near Izumo City have always been surrounded by natural beauty, and residents seem to be very familiar with the sounds of nature. Living in such an environment for a long time seems to be one of the reasons why the subjects can recall these sounds easily.

Responses to Onomatopoeias Associated with Kitchen Work In this investigation, "kasha" and "pachi-pachi" were recognized as the sounds of kitchen work.

A woman mentioned that "kasha" indicated the clashing of pots and pans. Some women nodded their heads at this answer, and other women talked with neighbors afterwards. But men did not react to this onomatopoeia, although one man said that this kind of sound just represents "noise" to men.

Next, one woman said "pachi-pachi" indicated a popping sound, and another woman said that it indicated the sound of burning firewood, charcoal or similar substances.

With regard to "kasha", there were several responses from women in the questionnaires to the families that subjects had disliked the clashing sound of tableware, pots or pans even before they were affected by dementia. The following serves as a notable example: "When I (the daughter-in-law of a female subject) dropped a pot lid or something like that, she always

scolded me even if she was in another room." These responses suggest that seniors, at least those living in this district, generally dislike this kind of sound. Moreover this kind of sound seems to be considered as a noise which one ought not to make. Therefore, older females in this district have been careful not to make these kinds of sounds. This must be the reason why only women reacted strongly to this onomatopoeia.

Thus, the sounds of kitchen work, which are very familiar to women but unfamiliar to men, were recollected only by the female subjects.

Responses to Onomatopoeias Associated with Old Routines Onomatopoeias of sounds from the subjects' long-established routines were recognized by many seniors. These onomatopoeias also produced clear memories.

For example, a woman spoke in detail with gestures about the onomatopoeia "kachi-kachi". It was an old custom to strike flint-stones when someone went to work. A man then continued, saying that this custom originally meant "to go to work without mishap" and/or "to come back unhurt".

Responses to Onomatopoeias of Sounds That Pull at Heartstrings Each of the subjects responded to onomatopoeias of sounds that pulled at their heartstrings on account of a relation to his/her life history. Subjects often responded to this kind of onomatopoeia, not only with explanations of what the onomatopoeia indicated, but also with their own comments on the sounds or memories of the sounds.

For example, a man who loves the sound of temple bells mentioned that "when it comes to sounds, I think they should resound like a temple bell. Solemn sounds are quite good."

Another example, a woman who, according to the questionnaires to the families, loves the sound of festivals replied that "pee-hyala" was the sound of a festival flute, and started singing a children's song named "the village festival", in which "don-don-hyalala" occurs in the lyrics: in "don-don-hyalala", "don" indicates the sound of drums and "hyalala" indicates the sound of a festival flute.

The sound of flint-stones (above) was also classified into this type of reply.

These results show that elderly people suffering from dementia can easily recollect the sounds which had been once very familiar to them.

Response Patterns to Onomatopoeias As mentioned above, subjects responded to the sounds which had once been very familiar to them. Therefore, few were able to respond to almost all onomatopoeias. But those who did tended to make analytical comments. For example, a man responded most frequently in this investigation pointed out the difference between the timbre of a temple gong and that of a gong on a family Buddhist altar, and offered two onomatopoeias. This type of fine distinction did not occur with subjects who only responded to a limited number of onomatopoeias.

Moreover, the family of the man who responded most frequently to onomatopoeias wrote:

As he says that he is oversensitive, he dislikes all of loud sounds and is very often alarmed by them. It seems that loud voices or sounds remind him of enemy attacks.

During World War II, this subject seems to have been sensitive to sounds, discriminating between the sound of an enemy attack and other sounds in order to defend himself. So he seems to have established the habit of listening to sounds around him very carefully and analytically. His analytical comments to onomatopoeias originate from his own experiences in the wartime. This means that his response patterns to onomatopoeias also reflects his life history. He also responded to the sounds which has been very familiar to him.

DISCUSSION

As mentioned above, the subjects responded to sounds which had once been very familiar to them. In other words they were able to describe sounds which had once occupied important parts of their lives. This means they can recollect the sounds which had once occupied important parts in their lives. And this suggests that any soundscape designs for people affected by dementia must consider individual life histories.

However, not all sounds recollected were peculiar to their individual daily lives. Many of these sounds are rather common. This suggests that the kinds of sounds subjects can recollect very much depends on what kinds of sounds have been heard in their daily lives, which in turn indicates the importance of sound environments in which we all live. In other words, soundscape design must be discussed from the viewpoint of what kind of sounds "should" be heard. In addition to this, the use of background music, which masks sounds around us, must also be discussed from the same perspective. There is the possibility that overuse of background music prevents people from listening to the sounds around them.

Finally, the kinds of sounds recollected by the subjects in this study were closely correlated to the kinds of sounds they had listened to attentively. Our research shows that the more kinds of sounds subjects had listened to attentively, the more kinds of sounds they were able to recollect. This emphasizes the importance of the habit of listening to sounds around us attentively in our daily lives. Perhaps "sound education" [6], which is a part of soundscape design, would be most effective here. And further, the habit of listening, as Schafer supposes, may finally become an important step in improving the world's soundscape [6].

Thus, soundscape design, both educational way and technical way [3], is important not only to people affected by dementia but also to all of us.

CONCLUSION

The results of our investigation are summarized as follows.

- (1) Generally speaking, nature sounds, like songs of birds and sound of rain are recollected easily from onomatopoeias regardless of sex.
- (2) Sounds of kitchen work are recollected by women only.
- (3) Sounds from old routines are recollected clearly.
- (4) Sounds that pull at elders' heartstrings are also recollected intensely from onomatopoeias.

These results show that the elders suffering from dementia are able to recollect the sounds which had once occupied very important parts of their lives.

This suggests importance of soundscape design in our daily lives. And background music must be considered as part of soundscape design.

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