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Preliminary comparison of soundscape preferences in community public spaces between the individuals with visual impairment and with normal vision

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ABSTRACT

Hearing is an important way for the visually impaired to perceive the environment, and the visually impaired have a different preference for urban soundscape than those with normal vision. Therefore, understanding the differences in the preference of the visually impaired and the normal vision to the urban soundscape will help to create a sound environment that is suitable for both of them, so as to enhance the inclusiveness of the urban environment. This study took the community public spaces as the typical urban environment research object, and used the Evaluation Grid Method (EGM) to conduct semi-structured in-depth interviews on soundscape preferences of 20 visually impaired individuals and 25 individuals with normal vision. By sorting out the interview results, 18 soundscape attributes preferred by the visually impaired and 12 soundscape attributes preferred by the normal vision individuals were extracted. Through comparison, it was found that visually impaired individuals have richer descriptions and preferences of soundscape compared to those with normal vision, and the particularity of their preference is mainly reflected in its semantics and its promotion of spatial cognition of the visually impaired.

1. INTRODUCTION

The number of visually impaired individuals has been increasing year by year due to accidents, aging, and eye diseases [1]. Hearing is an important way for visually impaired individuals to perceive the environment, thus designing urban soundscapes in a targeted manner can encourage them to step out of their homes and enhance the inclusiveness of urban environments.

Studies have explored the perception of visually impaired individuals in urban spatial environments from the perspective of the objective environment and found that echo in the city is an important factor influencing their perception [2]. Other research has assessed the walkability of urban environments from the perspective of visually impaired and analysed the impact of physical factors in the streets on their activities [3]. In terms of subjective perception, studies have found that visually impaired have different feelings in different types of spaces, and identified sound as a core

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factor influencing their sense of safety [4]. However, there is relatively little research considering the auditory preferences of visually impaired individuals.

There have been numerous studies on the soundscape preferences of sighted individuals, exploring preferences from various perspectives such as space types and users of the space [5-7]. The conclusions drawn often relate to the types of sound sources, revealing common regularities such as preferences for positive natural sounds and aversion to noise like traffic sounds [8,9]. However, there is relatively less research comparing the soundscape preferences of visually impaired individuals with those of sighted individuals, in order to explore urban sound characteristics that meet the preferences of both groups.

Based on this, this study explored the sound preferences of visually impaired and sighted individuals for community public spaces, and compared the preferences of both groups, aiming to provide design guidelines for community public spaces that accommodate the common needs of visually impaired individuals and sighted individuals, and create comfortable and attractive venues for activities, and enhance the overall inclusiveness of urban environments.

2. METHODS

2.1. Participants

This study recruited a total of 45 participants. Among them, there were 20 visually impaired participants, including 15 who were completely blind and 5 with low vision. They were 12 males and 8 females, with an average age of 33 years (Min = 18; Max = 60). Additionally, there were 25 sighted participants, comprising 12 males and 13 females, with an average age of 35 years (Min = 18; Max = 61).

2.2. Interview

This study employed the evaluation grid method (EGM) from the field of miryoku engineering to conduct interviews with participants, aiming to capture individual cognitive concepts. Through interviews with highly involved groups, the method explored the attractive attributes of products or spaces, and subsequently organized evaluation structure diagrams to concretize vague concepts [10]. Therefore, applying this method to interview both visually impaired individuals and sighted individuals can extract their soundscape preference more concretely, facilitating comparisons in subsequent analyses.

The specific content of the interview is as follows: Firstly, through questioning, the original evaluation items (median) are obtained, i.e., what kind of research subjects are considered attractive or preferred. Subsequently, abstract value judgments (upper) are probed, concerning the feelings elicited by research subjects possessing these attractive or preferred attributes. Finally, further inquiries are made into specific conditions and characteristics (lower) of research subjects possessing these attributes [11].

2.3. Procedure and analysis

Before the interview, the researchers explained the concept of soundscape and community public spaces to the participants. Subsequently, the following specific questions were sequentially presented:

(1) Original evaluation item (median position): What kind of soundscape of community public spaces do you consider good, attractive, preferred and makes you willing to go out of your house to engage or stay?

(2) Abstract value judgment (higher position): how does this soundscape make you feel?

(3) Specific conditions and characteristics (lower position): What specific content or details are present in such a soundscape?

Afterward, the interview results were combined and organized. Based on the upper, middle, and lower positions, the researchers summarized the preferences for soundscape in community

public spaces for both visually impaired individuals and sighted individuals. The extracted attributes were then compared and analysed.

3. RESULTS

3.1. Soundscape preference of the visually impaired

This study extracted 18 soundscape preference attributes in community public spaces (original evaluation item) from interview results of visually impaired individuals. They triggered 10 main positive feelings (abstract value judgment), and 21 specific soundscape elements (specific conditions and characteristics), the specific content is shown in Figure 1. Research indicated that among the preferred soundscape for visually impaired individuals, those described as *quiet* and *natural* elicited the most positive experiences. Additionally, the specific conditions and characteristics contained within *informative*, *natural*, and *anthropogenic* were the most abundant.

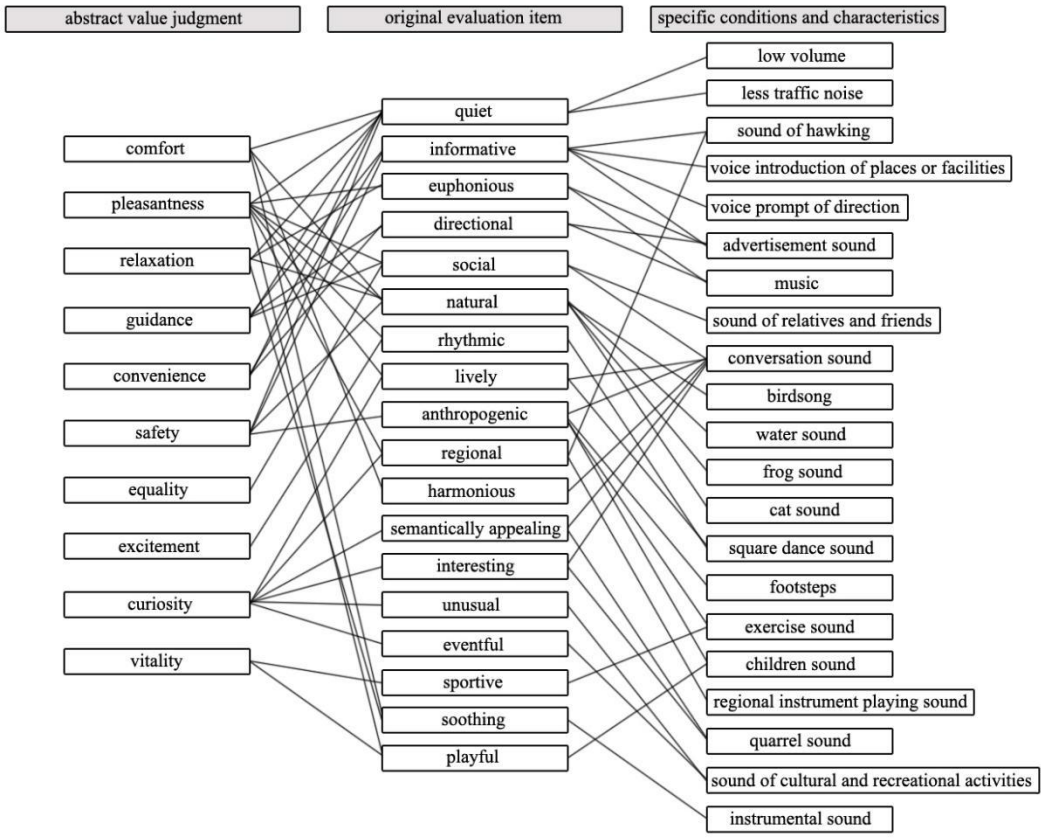

Figure 1: Evaluation structure diagram of the visually impaired participants.

3.2. Soundscape preference of the sighted individuals

The study also extracted 12 soundscape preference attributes in community public spaces (original evaluation item) from interview results of sighted individuals. They triggered 6 main positive feelings (abstract value judgment), and 20 specific soundscape elements (specific conditions and characteristics), the specific content is shown in Figure 2. Research indicated that among the preferred soundscape for sighted individuals, those described as *quiet*, *soothing* and *bustling* elicited the most positive experiences. The specific conditions and characteristics contained within *euphonious* and *natural* were the most abundant.

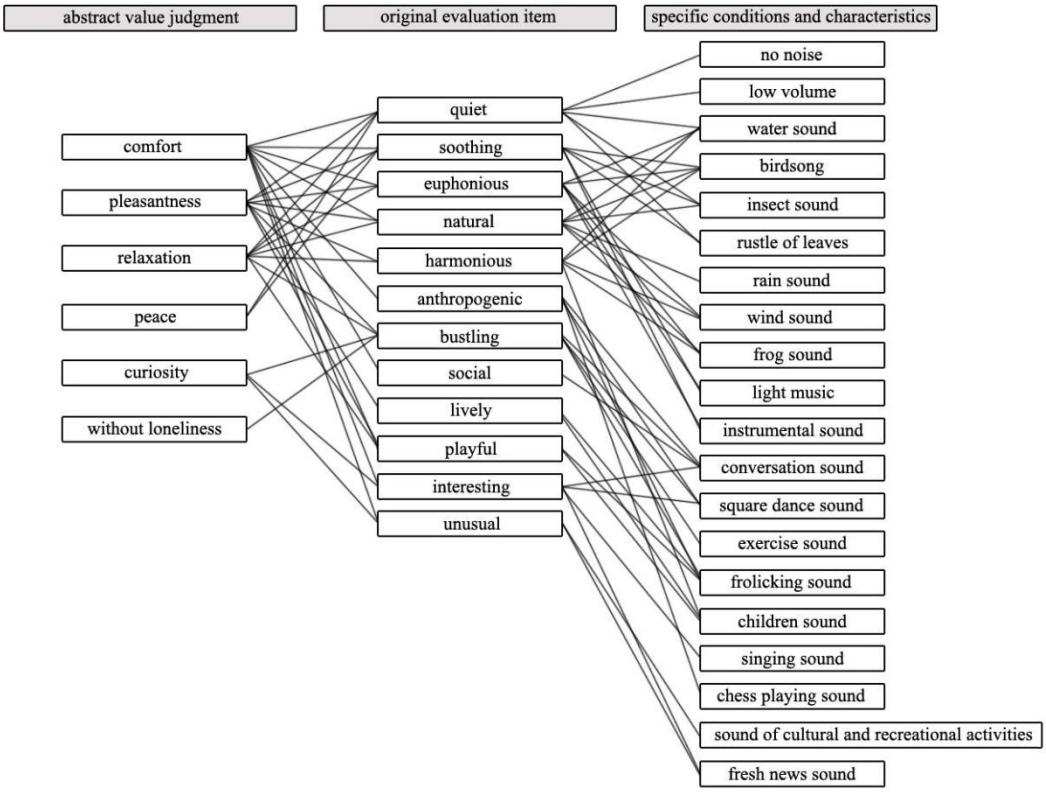

Figure 2: Evaluation structure diagram of the sighted participants.

3.3. Comparison of the soundscape preferences

This study compared the soundscape preferences in community public spaces of visually impaired individuals with those of sighted individuals, and the results revealed that visually impaired individuals have more soundscape preference attributes, as well as more corresponding positive feelings and specific soundscape elements. Among these attributes, *informative*, *directional*, *rhythmic*, *regional*, *semantically appealing*, and *eventful* are distinct preferences of visually impaired individuals compared to sighted individuals, and they mainly reflect that visually impaired individuals prefer soundscapes that have a certain semantic appeal and can promote their cognition of the surrounding environment. Additionally, both groups share soundscape preferences for *quiet*, *soothing*, *euphonious*, *natural*, *harmonious*, *anthropogenic*, *social*, *lively*, *playful*, *interesting*, and *unusual*, which almost cover all soundscape preferences of sighted individuals except for *bustling*.

4. CONCLUSIONS

This study explored the differences in soundscape preferences in community public spaces between visually impaired individuals and sighted individuals through interviews. 18 soundscape preference attributes of visually impaired individuals were extracted, with the most positive feelings being associated with *quiet* and *natural*; *informative*, *natural* and *anthropogenic* involved more soundscape elements. Sighted individuals had 12 soundscape preference attributes, with the most positive feelings coming from *quiet*, *soothing*, and *bustling*; *euphonious* and *natural* involved more soundscape elements. Compared to sighted individuals, visually impaired individuals had a richer soundscape preference in community public spaces, the difference between their preference and the preference of the sighted individuals was mainly reflected in semantic aspects and the promotion of spatial cognition. Additionally, the soundscape preferences of visually impaired almost encompassed all the soundscape preferences of sighted individuals.

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