

Recreational Spaces for the Visually-Handicapped: Taking Part in a Guided Bus Tour

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Abstract

It is important that visually-handicapped people can adapt themselves to contemporary society, operate freely and enjoy leisure as much as normal-sighted people can.

This is a case study on enjoying leisure and recreational spaces for the visually-handicapped. The visually-handicapped take part in a guided bus tour, and we investigate whether they can enjoy the bus ride and the facilities visited. The guided bus tour takes one whole day during which they visit five facilities - an aquarium, a multi-purpose dome, a castle, a water bus and a sky observation deck.

1. Introduction

Environments for the visually-handicapped are being modified in Japan. However, there are still many dangerous spaces that lie in wait. They often have accidents or lose their way. In fact, most visually-handicapped people only leave their home if they absolutely must. It is important that visually-handicapped people can adapt themselves to contemporary society, operate freely and enjoy leisure as much as normal sighted people can. In this way, they can begin to feel that everyone is truly a member of society.

Our team has carried out a series of studies¹⁾⁻³⁾ on recreational spaces for the visually-handicapped and the spatial cognition of them. A museum, zoo, botanical garden, hiking course and an amusement park were investigated. Experiments in spatial cognition were carried out using model spaces in a laboratory. Spatial research on the visually-handicapped has been published since the 1980's, and there are already a large number of findings. Prior investigations have focused on out door recreation and sports⁴⁾, cultural facilities⁵⁾, wayfinding⁶⁾, spatial cognition⁷⁾, and so on.

In this study, the visually-handicapped take part in a guided bus tour and we investigate whether they can enjoy the bus ride and the facilities visited. The guided bus tour takes one whole day, during which the subjects visit five facilities - an aquarium, a multi-purpose dome, a castle, a water bus and a sky observation deck. The investigation is carried out under the headings "facilities", "tour" and "bus transport", using questionnaires and interviews. The evaluation of data gathered is made by comparing the visually-handicapped to the normal-sighted.

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2. Outline of Experiments

2.1 Subjects

The subjects are five visually-handicapped people between 18 and 29 years old, and five normal-sighted university students aged between 20 and 25 years old.

Attribution of the visually-handicapped subjects is shown in Table 1.

Table 1. Attribution of the visually-handicapped subjects

Subjects	blind 1	blind 2	blind 3	blind 4	blind 5
age / sex	29years/male	22years/male	28years/male	22years/female	18years/female
occupation	self-employed business man	university student	unemployed	university student	university student
level of handicap	1st class, acquired blindness	1st class, congenital blindness	1st class, congenital blindness	1st class, acquired blindness	1st class, acquired blindness
age became blind	17 years	0 years	0 years	20 years	15 years
disease	glaucoma, cataract	cataract	atrophy of optic nerve	diabetic	retinitis pigmentosa
eyesight 1: right : left	light perception light perception	0 0	0 0	0 0	0 0
view	nothing	nothing	nothing	nothing	nothing
eyesight 2 :light :color :shape	△ × ×	× × ×	× × ×	○ × ×	○ × ×
hearing	normal	normal	normal	normal	normal
training : age : contents	17 years walking training daily life training braille training personal computer	6-18 years walking training daily life training braille training	6-15 years walking training daily life training braille training	20 years walking training daily life training braille training personal computer	11years walking training braille training
braille reading	○	○	○	○	○
walking cane	all the time	all the time	all the time	all the time	all the time
education:primary :junior :high school :university :professional education	general course general course general course general course none	school for the blind school for the blind school for the blind general course none	school for the blind school for the blind school for the blind general course none	general course general course general course general course none	school for the blind school for the blind school for the blind general course none
destination	hospital, bank, client	university, parents' home	light-house, Osaka Castle Park	university, club activity	university
frequency	3 or 4 times/week	every day	once /week	5 days/week	5 days/week
care-giver accustomed place unaccustomed place	with a care-giver with a care-giver	alone alone	alone alone	alone with a care-giver	alone with a care-giver
transportation	train, bus, taxi	train	train, bus	train, bus, taxi	bus
housing type	detached house	apartment house	apartment house	apartment house	detached house
dwelling style	with family	without family	without family	without family	with family
health condition	good	good	good	good	good

2.2 Tour and facilities

The tour is one day course of regular guided bus tour managed by Osaka City. The facilities visited are an aquarium named “Kaiyu-kan”, whose theme is the Pacific Ocean, a multi-purpose dome known as “Osaka Dome” with a capacity of 50,000 people, a historical heritage site, “Osaka Castle”, a water bus called “Aqua Liner” and the observation deck of “the Umeda Sky Building” whose height is 170 meters. The time required for this tour is eight hours. The sightseeing bus is a double-decker with a capacity of 64 people. (Fig. 1)

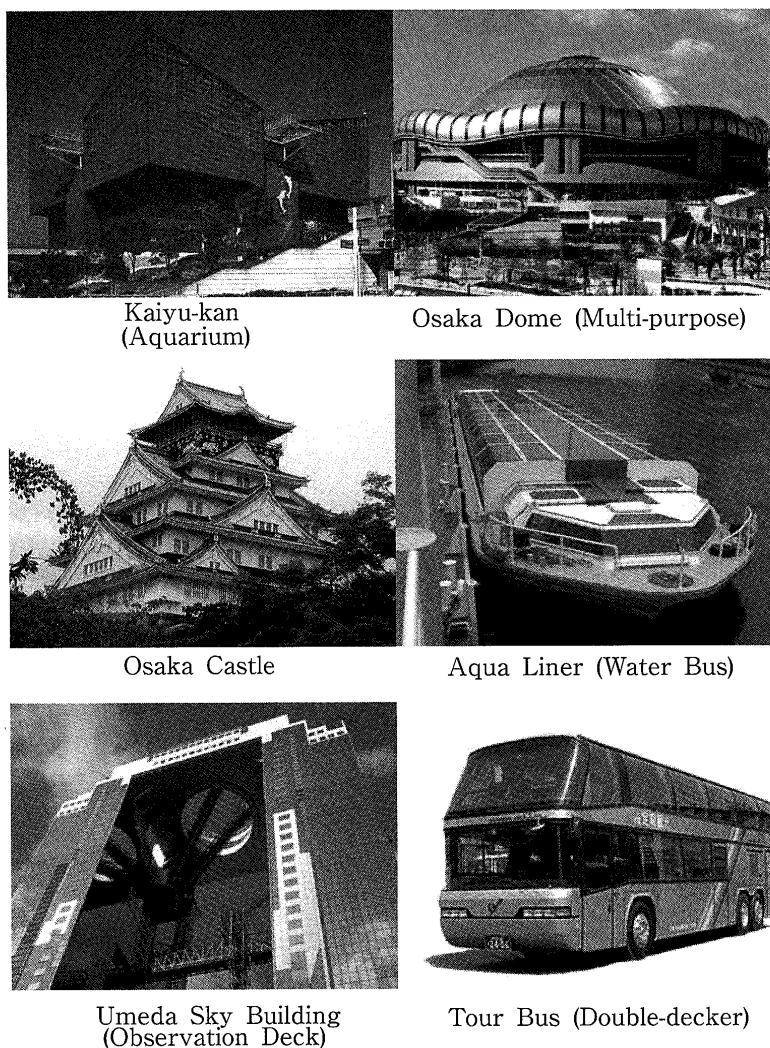


Fig. 1 Facilities visited and tour bus

2.3 Experimental periods

The experimental periods were 23rd July and 23rd October, 2005. Although the two days are three months apart, it is thought that this would have had no influence on the evaluation.

2.4 Experimental and analysis methods

2.4.1 Experimental methods

In this investigation, each facility, the whole tour, bus transport, etc. are evaluated by questionnaire and interview. The questionnaire is mainly about “safety”, “comfort”, “enjoyment” and “satisfaction”. There are 20 questions about each facility, 25 on the whole tour and 23 on bus transport. Answers are made by choosing one of five options.

Next, problems from the point of observation are clarified and discussed.

2.4.2 Analysis methods

Points are given each answer of the questionnaire so that the results are easy to analyze. A good evaluation means high points. Points range from 1 to 5. 3 points is “regular”.

Next, significant differences in the evaluation between the v.h. and the n.s. are analyzed

by T-Test.

3. Results and Considerations

3.1 Evaluation of each facility

3.1.1 Kaiyu-kan (aquarium): 50 minutes stay

Evaluation of the Kaiyu-kan is shown in Fig. 2. A significant difference between the v.-h. and the n.-s. is seen in “enjoyment”, “satisfaction”, “fatigue”, “losing the way”, “recognition of toilet”, “recognition of shop”, “enjoyment with tourists”, “friendliness”, “favorite” and “revisiting”. Ten categories are asterisked. In these categories, the evaluation of the v.-h. is lower than that of the n.-s.. In the case of the v.-h., the evaluation of “enjoyment with tourists” is remarkably low. Kaiyu-kan was crowded with a lot of visitors, and the v.-h. had to take not to collide with other tourists. Since it was not easy for the v.-h. to walk through this crowded facility, they could neither enjoy it nor relax. In the case of the n.-s., their evaluation of “stay time” is low: they tended to answer that stay time is too short.

3.1.2 Osaka Dome: 45 minutes stay

Evaluation of Osaka Dome is shown in Fig. 3. A significant difference between the v.-h. and the n.-s. is seen in “satisfaction”, “losing the way”, “recognition of toilet”, “recognition of doorway”, “enjoyment with tourists” and “revisiting”. In “satisfaction” and “revisiting”, the evaluation of the v.-h. is higher than that of the n.-s.. In the case of both the v.-h. and the n.-s., their evaluation of “fatigue” is high. It is thought that the subjects were not tired, since they had had lunch and taken a rest in a restaurant. Moreover, their evaluation of “safety” and “recognition of shop” is high, while that of “equipment for the visually-handicapped” is low. No event was taking place, however, on the investigation day.

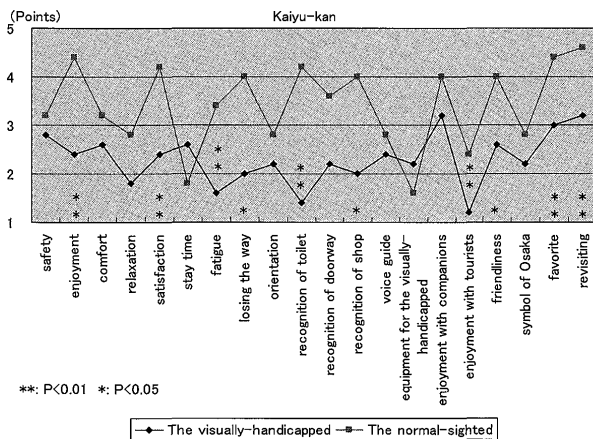


Fig. 2 Evaluation of Kaiyu-kan

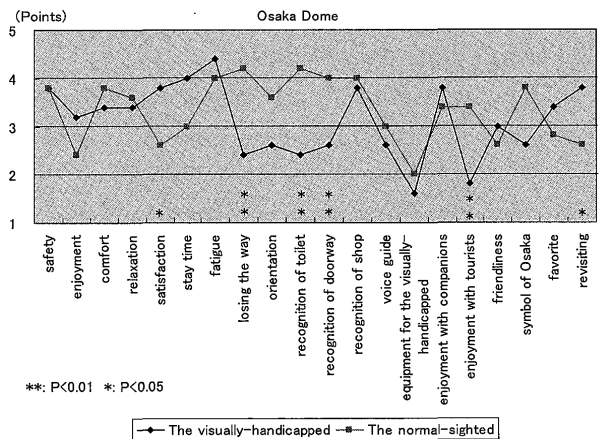


Fig. 3 Evaluation of Osaka Dome

3.1.3 Osaka Castle: 30 minutes stay

Evaluation of Osaka Castle is shown in Fig. 4. A significant difference between the v.-h. and the n.-s. is seen in “orientation”, “recognition of toilet” and “recognition of doorway”. In these categories, the evaluation of the v.-h. is lower than that of the n.-s.. The v.-h.’s evaluation of “recognition of toilet” is lowest of all. With regard to “safety”, the evaluation of the v.-h. is comparatively high, while that of the n.-s. is rather low. This shows that the n.-s. felt that going up and down between floors by narrow or perpendicular staircases was dangerous, while the v.-h. did not. Furthermore, under “voice guide”, the evaluation of the v.-h. is low, while that of the n.-s. is high. This shows that the explanation by the voice guide was more for the n.-s. than for the v.-h.. However, the v.-h. showed interest in the voice guide and enjoyed it to some extent. In the case of both the v.-h. and the n.-s., the evaluation of “enjoyment”, “enjoyment with companions” and “symbol of Osaka” is high. In the case of the n.-s., the evaluation of “stay time” is lowest: they tend to answer that stay time is too short.

3.1.4 Aqua Liner (water bus): 45 minutes stay

Evaluation of Aqua Liner is shown in Fig. 5. A significant difference between the v.-h. and the n.-s. is seen only in “enjoyment with tourists”. In this category, the evaluation of the v.-h. is remarkably low. Further, that of “recognition of toilet” is also low. In the case of both the v.-h. and the n.-s., the evaluation of “relaxation”, “fatigue”, “enjoyment with companions” is high. The reason may be that the subjects were seated without wandering in the water bus. On the other hand, that of “equipment for the visually-handicapped” is low. In the case of the n.-s., they tend to regard “Aqua Liner” as a symbol of Osaka.

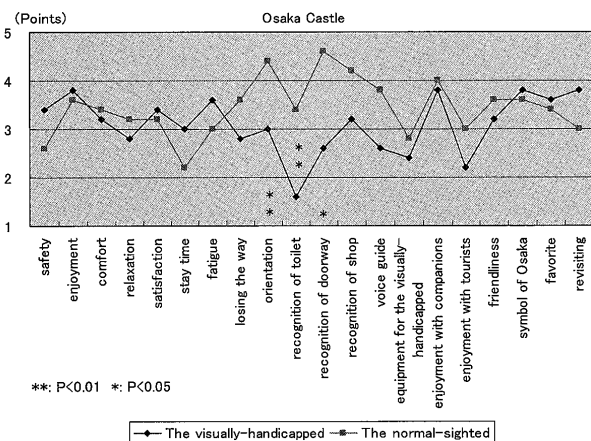


Fig. 4 Evaluation of Osaka Castle

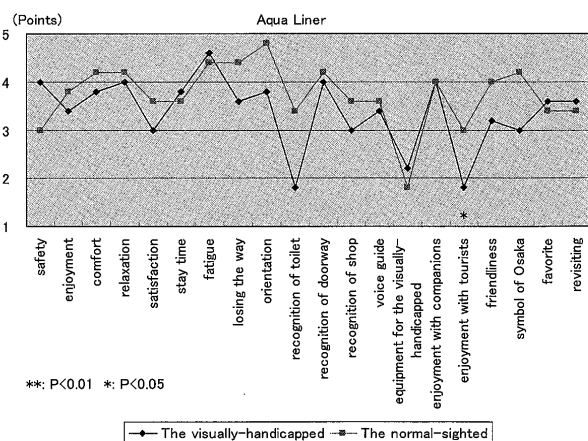


Fig. 5 Evaluation of Aqua Liner

3.1.5 Umeda Sky Building (observation deck): 30 minutes stay

Evaluation of the Umeda Sky Building is shown in Fig. 6. A significant difference between the v.-h. and the n.-s. is seen in “recognition of doorway” and “enjoyment with tourists”. In these categories, the evaluation of the v.-h. is lower than that of the n.-s.. In most categories, the evaluation of the v.-h. is lower than that of the n.-s. . However, in the case of both the v.-h. and the n.-s., the evaluation of “fatigue”, “enjoyment with companions”, “favorite” and “revisiting” is high, and that of “equipment for the visually-handicapped” is lowest.

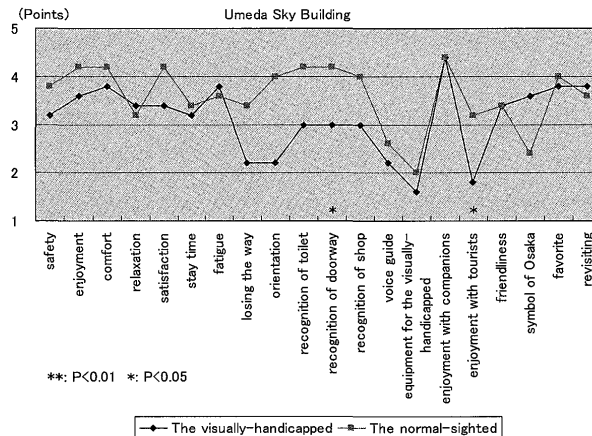


Fig. 6 Evaluation of Umeda Sky Building

3.2 Comparison between facilities

With regard to each category, the results of comparison between facilities showed two peculiar types (See Figs. 2-6, Tables 2 and 3).

Type 1 is shown in “symbol of Osaka”. The v.-h. tend to regard the “Umeda Sky Building” as a symbol of Osaka, while the n.-s. do not. The n.-s. tend to regard “Osaka Dome” as a symbol of Osaka, while the v.-h. do not. Both the v.-h. and the n.-s. tend to regard “Osaka Castle” as a symbol of Osaka. Neither the v.-h. nor the n.-s. tend to regard “Kaiyu-kan” in this way.

Table 2. Type 1 : “symbol of Osaka”

	Yes	No
The visually-handicapped	Osaka Castle Umeda Sky Building	Kaiyu-kan Osaka Dome
The normal-sighted	Osaka Castle Osaka Dome Aqua Liner	Kaiyu-kan Umeda Sky Building

Table 3. Type 2 : “enjoyment”, “satisfaction”, etc.

	Yes	No
The visually-handicapped	Umeda Sky Building Osaka Dome Aqua Liner Osaka Castle	Kaiyu-kan
The normal-sighted	Aqua Liner Kaiyu-kan Umeda Sky Building	Osaka Dome

Type 2 is shown in “enjoyment”, “satisfaction”, “friendliness”, “favorite”, and “revisiting”. The v.-h. tend to evaluate “Osaka Dome” highly, while the n.-s. rate it low. On the other hand, the n.-s. tend to evaluate “Kaiyu-kan” highly, while the v.-h. rate it low. Moreover, both the v.-h. and n.-s. tend to rate highly the “Aqua Liner” and the “Umeda Sky Building”.

It may be seen that the evaluation of the v.-h. can be quite the opposite of that of the n.-s.. On occasion, however, that of the v.-h. might be exactly the same as that of the n.-s..

3.3 Whole tour

3.3.1 Evaluation of the tour

The evaluation of the tour is shown in Fig. 7. A significant difference between the v.-h. and the n.-s. is seen in “enjoyment with companions”, “time required”, “uneasiness” and “number of facilities”. The n.-s. tend to answer that the time was short and the number of facilities high. The v.-h. tend to feel uneasy, while the n.-s. feel easy. In the case of both the v.-h. and the n.-s., the evaluation of “fatigue”, “equipment for the visually-handicapped” and “only visually-handicapped person’s use” is low. That of “total evaluation” of the two is neither high nor low.

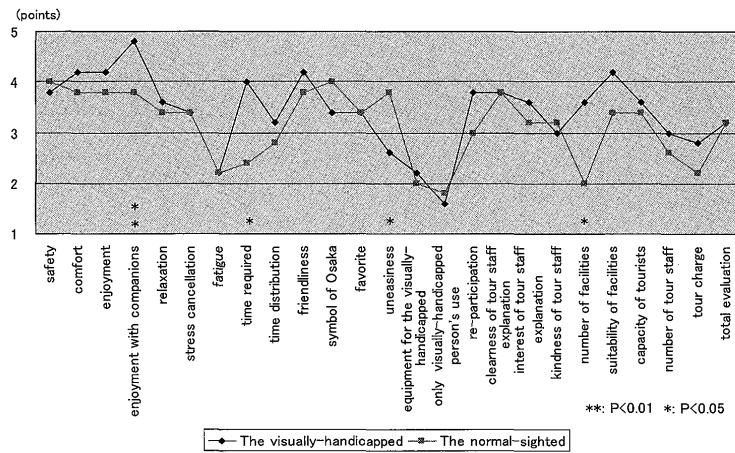


Fig. 7 Evaluation of the tour

3.3.2 Most interesting facility

The facility which was the most interesting to both sets of subjects is shown in Fig. 8. In the case of both the v.-h. and the n.-s., evaluation of the “Umeda Sky Building” came top, whereas that of “Aqua Liner” was only 20%. The evaluation of “Osaka Castle” has registered only in the case of the v.-h., while that of “Kaiyu-kan”, only in case of the n.-s.. The evaluation of “Osaka Dome” has registered in neither case. In the Umeda Sky Building, the n.-s. enjoyed the view of Osaka, while the v.-h. enjoyed the sensations of wind, sunshine, sunset rays and swirling vapor. In Osaka Castle, the v.-h. could enjoy and were interested in the exhibitions with taped explanation. (Fig. 9)

The v.-h. tend to evaluate the facility of “symbol of Osaka” as interesting facility, while the n.-s. do not. They tend to evaluate the facility of “enjoyment”, “satisfaction”, “friendliness”, etc. rather than that of symbol of Osaka as so. (Tables 2 and 3, Fig. 8)

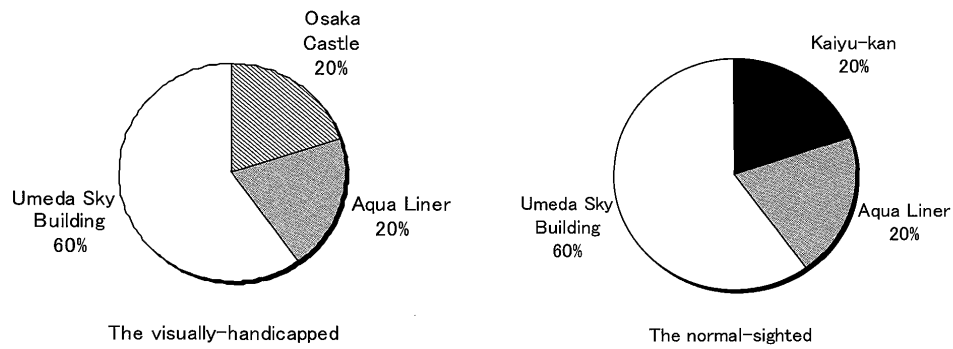


Fig. 8 Interesting facility



The blind feeling the wind and bathing in sunshine on the observation deck of Umeda Sky Building

The blind enjoying the exhibition through taped voice explanation of Osaka Castle

Fig. 9 Subjects in Umeda sky building and Osaka castle

3.4 Bus transport

3.4.1 Bus

The evaluation of the sightseeing tour bus itself is shown in Fig. 10. A significant difference between the v.-h. and the n.-s. is seen only in “enjoyment”. In this category, evaluation by the v.-h. is higher than that by the n.-s.. It is thought that the v.-h. felt pleasant in the bus. Furthermore, the v.-h. evaluated the bus as suitable transportation, and they could relax in the bus. However, both the v.-h. and the n.-s., evaluated “equipment for the visually-handicapped” lowest.

3.4.2 Transportation

Evaluation of bus transportation is shown in Fig. 11. A significant difference between the v.-h. and the n.-s. is seen only in “driving operation”. In this category, evaluation by the v.-h. is higher than that by the n.-s.. With regard to “interest in guide’s explanation”, no significant difference between the two can be seen, except that the evaluation of the v.-h. is considerably higher than that of the n.-s.. This shows that the v.-h. could enjoy the explanation. Both the v.-h. and the n.-s. evaluated “safety” as high, with that of the being higher than that of the n.-s.. However, in “enjoyment with tourists”, the evaluation of the v.-h. is lower than that of the n.-s., and is the lowest of all categories. It is thought that the v.-h. had to take special care not to bump into the tourists in the bus just as they did at some facilities.

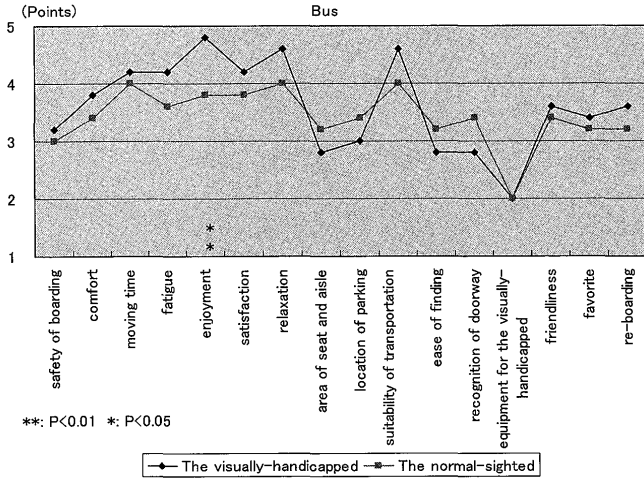


Fig.10 Evaluation of the tour bus

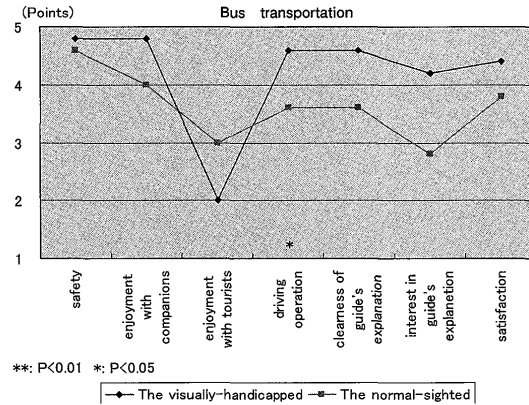


Fig. 11 Evaluation of bus transportation

3.5 Problems observed (Fig. 12)

3.5.1 Space composition

In the Kaiyu-kan, the v.-h. tended to lose their way and to stray into blind alleys, since the space composition was complex and they could not understand the route order. Moreover, it was not easy for the v.-h. to walk through, because there were a lot of visitors beside the tank walls and because there were benches both in the middle of the passage and along the wall on the opposite side of the tank. A lot of visitors were sitting on these benches.

The v.-h. often had to walk through the mullions of the fire doors in the center of the passage. One or two of them bumped into the mullion.

3.5.2 Equipment and devices

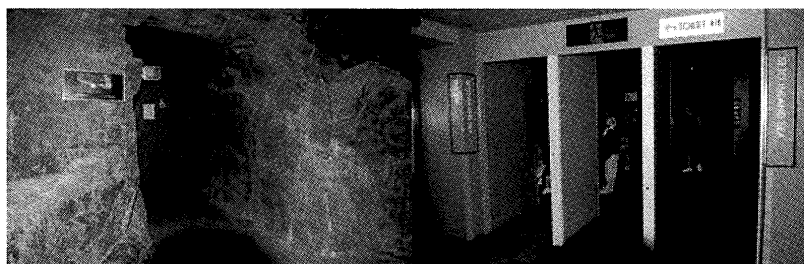
There was equipment such as tactile warning blocks in most facilities. However, between the bus and each facility, there was little equipment. It was not easy for the v.-h. to walk alone to the facility. In the Kaiyu-kan, a portable voice guide could be borrowed, but there was no braille on this machine. Furthermore, this machine was covered with vinyl. The operation of the machine was difficult for the v.-h. and they could not distinguish the buttons.

3.5.3 Staff assistance

Between bus and facilities, the tour guide did not help the v.-h.. In Osaka Castle, the v.-h. could not take the elevator in spite of the representation of handicapped priority. In the Kaiyu-kan, when the v.-h. borrowed voice guide machines, it was difficult for them to understand the operation, since the facility staff member explained the operation only orally. This explanation was for the n.-s.. A Kaiyu-kan staff member even bumped into a v.-h. person walking in the facility !

3.5.4 Surrounding persons

When the v.-h. were walking, people nearby did not try to help them. The v.-h. often bumped into surrounding people, and apologized. They always said "sorry" when walking. Since the v.-h. are keenly aware of troubling people nearby, they always have to take special



Blind alley in the Kaiyu-kan

The mullions of the fire door in the way of the route



Benches along the wall on the opposite side of the tank

Benches in the middle of the passage



The facility staff member is explaining the operation of the machine orally



Portable Voice Guide

Fig. 12 Problems observed

care not to interfere with them. It is necessary here to remove not only a material barrier but also a mental one.

4. Conclusions

- (1) In most facilities, a significant difference between the v.-h. and the n.-s. is seen in “recognition of toilet” and “recognition of doorway”. In both cases, the evaluation of the v.-h. is lower than that of the n.-s.. Some v.-h. people said that they hesitated to go out because they could not recognize toilets. The visually-handicapped should be able to recognize toilets and doorways easily. It is necessary for them to understand the space composition and to be equipped.
- (2) In most facilities, a significant difference between the two is also seen in “enjoyment with

tourists". This shows that the blind cannot enjoy socializing with tourists because they are always taking special care not to interfere with them. It is necessary here to remove not only a material barrier but also a mental one.

- (3) Two peculiar types of facility emerged: those in which the evaluation of the v.-h. was quite different from that of the n.-s. and those in which they were the same.
- (4) For both the v.-h. and the n.-s., the overall evaluation of the tour was neither high nor low. The v.-h. expect to participate in this tour again. But both the v.-h. and the n.-s. feel that it would be difficult for the visually-handicapped to go on the tour alone because the equipment in each facility and in the bus are inadequate and the staff unhelpful.
- (5) Osaka Dome was interesting to neither the v.-h. nor the n.-s.. The Kaiyu-kan was interesting to the n.-s., but not to the v.-h.. Osaka Castle was interesting to the v.-h., but not to the n.-s.. Umeda Sky Building, however, was interesting to both the v.-h. and the n.-s..
- (6) The v.-h. evaluated the tour bus as suitable transportation. Transportation by bus made them feel safe and pleasant, although they always took special care not to interfere with other tourists on the bus.
- (7) In the Kaiyu-kan, the v.-h. tended to lose their way and to stray into blind alleys, since the space composition was complex and they could not understand the route order. It was dangerous for the v.-h. that a lot of barriers were in the middle and on both sides of the passages. The walking route should be more secure.

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