

## **RELATIONSHIP BETWEEN COMMUNICATION WAYS AND READING STRATEGIES IN READING OF DEAF PERSONS**

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### **ABSTRACT**

Deaf students need specific and effective methods of reading because they have a variety of communication ways (modes) in their daily lives. In this study, the relationship between three communication ways and three reading strategies in “story reading” of deaf college students was investigated. Three groups of 15 college students were studied: 5 deaf students who do not make use of sound in their daily lives, 5 deaf who make use of sounds in their daily lives and 5 hearing students read 3 stories using the following reading strategies; reading aloud, silently mouthing and silent reading. The stories were: 341, 359, and 378 characters, each at the third grade level of elementary school, while measuring their eye movements. After reading, they were requested to recall the stories they had read. Analysis was done following fixation time, fixation count and reading time. Later, the recall rate was measured. In silent reading, the deaf students’ (both those who make use of sound in their daily lives and those who do not make use of sound in their daily lives) reading span was consistently less than that of the hearing students. Despite that, the deaf students who make use of sound in their daily lives recalled the stories read through the reading aloud and silently mouthing strategies greater than the silent reading strategy. The deaf students who make use of sounds in daily lives can pay attention to their articulatory movements.

### **INTRODUCTION**

Reading ability is one of the important skills for our daily activities such as learning, collecting information, and communication. Mainly, there are two types of reading, reading aloud and silent reading. When we read aloud, we get feedback of the auditory information, coordinate articulatory movements, and make a phonological representation (Takahashi 2013, 99). Auditory information and articulatory movements are supposed to maintain the information we read. Takahashi and Tanaka (2011, 184) examined these roles of functions by comparing the recognition performance using the following 4 types of reading strategy: “with articulatory movements and auditory information”, “with articulatory movement without auditory information”, “without articulatory movement with auditory information”, “without articulatory movement or auditory information”. As a result of this comparison, they suggested articulatory movements are supposed to keep order of the parse in sentences while auditory

information are kept at a part of the sentence for a short time. Although deaf who do not make use of sounds, especially communication, in their daily lives may not have to pay attention to produce sounds, deaf who make use of sounds, especially communication, in their daily lives have to pay attention to their articulatory movements. Then we focused on the relationship between communication way and reading strategies in the reading of deaf persons. Since previous studies had indicated that deaf people use visual differently, eye movement is also measured to identify their characteristics of fixation time, fixation count, and reading time while reading.

## **METHOD**

### Participants

Three groups of 15 college students were studied; 5 deaf students who do not make use of sound in their daily lives (Deaf Low Sound: DLS), 5 deaf students who make use of sounds in their daily lives (Deaf High Sound: DHS) and 5 hearing students. The deaf students were required to choose their main daily communication mode from the following choices: Japanese, Japanese Sign Language, Written Japanese, other. Table 1 shows communication characteristics of deaf students.

Table 1 Main Communication Mode of the Deaf Participants

P	Age (yrs)	Sex (Male/Female)	dBHL	Main Communication Mode (Japanese/Japanese Sign Language)	
A	24	F	90, 105	Japanese Sign Language	
D	B	23	M	105	Japanese Sign Language
L	C	22	M	100	Japanese Sign Language
S	D	25	M	100	Japanese Sign Language
	E	23	F	110	Japanese Sign Language
	F	22	F	89	Japanese
D	G	22	M	100	Japanese
H	H	21	F	90	Japanese
S	I	20	M	100	Japanese
	J	23	F	85	Japanese

### Materials

The 3 stories were chosen from the third-grade-level textbook (for 8-9-years-olds) in elementary school. Each story had 341, 359 and 378 characters.

### Apparatus

Tobii T60XL Eye Tracker was used to measure fixation time, fixation number, and reading time while reading a story.

### Procedure

Randomly, participants were required to read 3 stories using the following reading strategies: reading aloud (RA), silently mouthing (SM) and silent reading

(SR). While reading, their eye movements were measured. After reading, they were asked to recount the story read.

**Analysis**

To measure their degrees of understanding, each sentence was judged if they recalled or not. If the participant recalled a whole sentence or rephrased the sentence, 1 point was added. If the participant remembered just one word in the sentence, 0.5 point was added. But if the participant misunderstood and recalled in a different context, no point was added. Finally, their recall rates, which is the degree of understanding indicated the percentage of their total score in the story. Fixation counts and letters in each story calculate “reading span”. Reading span is the number of letters read during the length from one fixation to next.

**RESULTS**

Participant D who is a deaf student and a member of the DLS category was exempted because his recall rate average cut across the average  $\pm 2SD$ . Then, data analysis was done for 9 deaf students (4 DLS, 5 DHS) and 5 hearing students. Table 2 shows the recall rate averages and SD in RA, SM, and SR.

Table 2 Recall Rate Average and SD in RA, SM, SR (%)

	DLS			DHS			Hearing		
	RA	SM	SR	RA	SM	SR	RA	SM	SR
Average	40.86	24.00	40.51	37.47	54.23	44.29	62.70	49.38	59.20
SD	7.21	1.73	21.18	16.22	13.08	21.50	14.10	13.78	12.54

The recall rate of the deaf students (both DHS and DLS) was less than the hearing students. In RA and SR, DLS (40.86%, 40.51%) and DHS (37.47%, 44.29%) showed similar recall rate averages even though DHS (54.23%) was greater than DLS (24.00%) in SM. In other words, the recall rate averages of DLS and Hearing in SM tended to be lower than those in other reading strategies. On the other hand, the recall rate average of DHS in SM was greater than those in RA and SR.

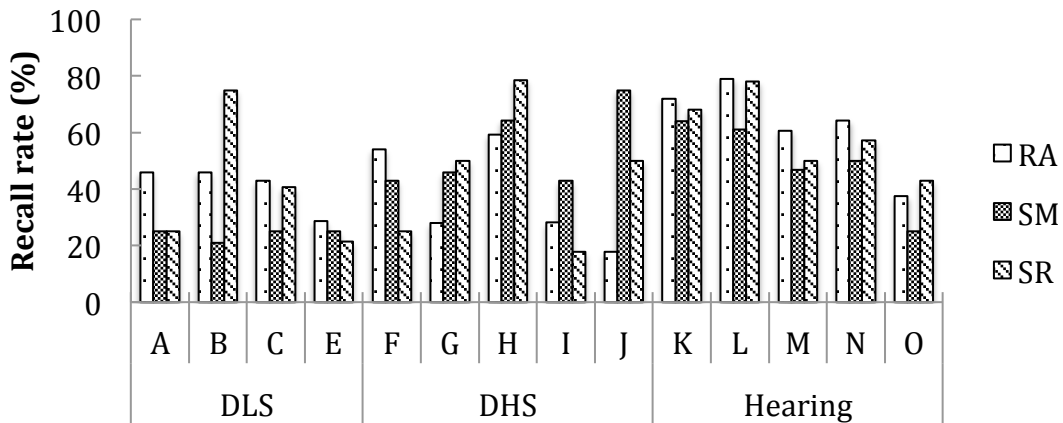


Fig.1 Each Participant’s Recall Rate

Fig 1 shows each participant's recall rate in RA, SM, and SR. The 2 participants of DLS (B, C) and all participants of Hearing (K, L, M, N, O) showed that the recall rate averages in SM was the least among the 3 reading strategies. In the case of DHS, performance in SM was not corresponded to the others.

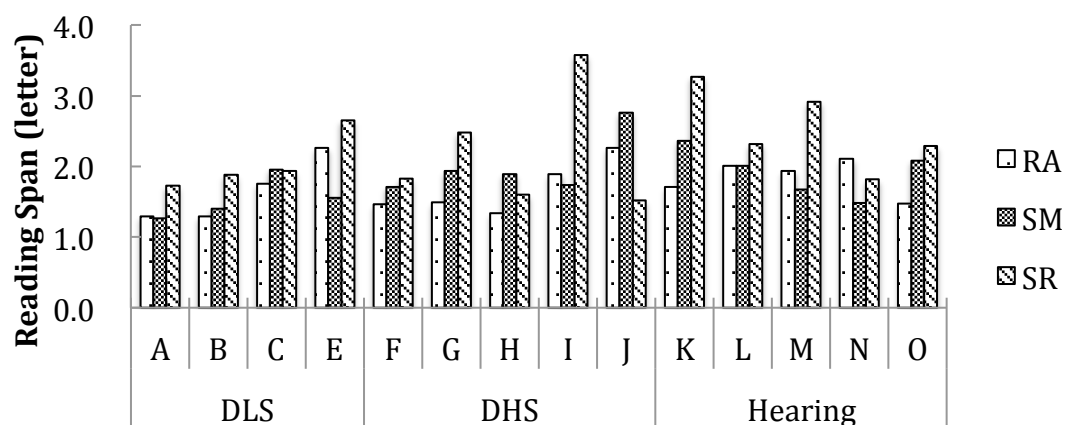


Fig.2 Each Participant's Reading Span

In SR, the reading span of A, B, E, (who are in the DLS category,) F, G, I, (who are in the DHS category,) K, L, M, O (who are hearing) was greater than the other reading strategies. Furthermore, in SR, the deaf students' reading span (such as A, B, C, F, H, J) tend to be consistently shorter than that of the hearing students (K, L, M, O).

## CONCLUSION

This study examined the relationship between communication modes and reading strategies between DLS, DHS, and Hearing students. In SM, the recall rates showed the differences between DLS, Hearing and DHS (Table 2, Fig.1). Previous researches reported the effects of articulatory suppression. That means DLS and Hearing are influenced by unfamiliar instruction in SM. However, the deaf students who make use of sounds in their daily lives can pay attention to their articulatory movements more naturally. It may be indicated that they are familiar with articulatory movements when transforming to phonological representation.

In SR, 10 of the 14 students showed that the reading span tends to be greater than other reading strategies. Especially, the reading span of the deaf students tends to be consistently less than that of the hearing students. During SM reading, the participants were permitted to move their eyes more freely than during other reading. However, during RA and SM, the participants were required to keep their eyes moving from left to right in order to coordinate whole articulation to make adequate sounds. That's why almost all the participants showed the reading span in RA and SM was less than in SR. However, the deaf student's recall rates in SR were not always greater than other reading strategies. Takahashi (2013, 104) mentioned the controlling eye movements effectively, like seeing whole a sentence, is also important for hearing young readers' comprehension in SR. In this research, college students participated.

Since the number of deaf people who go on higher education facilities in Japan is increasing, we have to think about their educational needs and the quality of their campus lives. Now, we have to respect a variety of reading styles and think about specific and effective methods of reading depending on their specific communication ways (modes) such as to provide them with accommodating class materials, leaflets, and documents to each student.

## **REFERENCES**

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