

THE DEVELOPMENT OF EMOTIONAL PERSPECTIVE-TAKING IN DEAF CHILDREN: A COMPARISON OF NON-VERBAL AND VERBAL TASKS

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ABSTRACT

Emotional perspective-taking refers to the ability to understand how others feel, which is known to be difficult for deaf children. This study aims to investigate the relationship between the development of emotional perspective-taking in deaf children and their language abilities. Forty-two deaf children in an elementary school for the deaf were divided into four groups according to their grade and language ability; middle grade with low or high language ability groups (ML and MH) and upper grade with low or high ability (UL and UH). The number of participants in each group was 8, 16, 6, and 12, respectively. The test consisted of two basic tasks (B) and three complex emotions with story tasks (C). In these tasks, we presented some situations with either only non-verbal tasks or verbal tasks, which would provoke some kinds of feeling for a character in the situation. Afterward, we asked the participants, "How does a character feel when he/she considers another's emotions?" The results revealed that all groups showed almost perfect scores in B tasks with both non-verbal and verbal tasks. In C tasks, however, low language groups showed lower scores than high language groups. This result suggests that understanding the flow of a story and the accompanying emotions elicited in characters with only pictures or texts would be difficult for them, and higher language skills and cognitive ability would be required to understand the complex situation and the emotions of others.

INTRODUCTION

Emotional perspective-taking refers to the ability to understand how others feel, and it has been explored in many studies, examining a wide range of emotions from basic emotions to more complex emotions (Borke, 1971; Dyck, & Denver, 2003; Howley & Howe, 2004; Kurde & Rodgon, 1975; Masugi & Choung, 2012; Urberg & Docherty, 1976).

Previous studies on deaf children showed that 5-8 year-old deaf children could perform satisfactorily in basic emotions tasks, although they had difficulty in complex emotions, but 9-11 year-old deaf children could perform complex emotions (Dyck, & Denver, 2003; Howley & Howe, 2004). In particular, the two kinds of tasks used by Howley and Howe (2004) in their studies: understanding what person A feels, or understanding that Person A understands what Person B feels. It revealed that the latter tasks were more difficult for deaf children than

hearing children. The reason for this difficulty was attributed to the language ability of deaf children and the effect of this on emotional perspective-taking. Another previous study (Masugi & Chung, 2012) explored an understanding of developmental change in the basic emotions of elementary school deaf students. It also showed a relation between language ability and understanding of basic emotions, and upper grade students were using situational cues rather than visual cues.

These previous studies indicated that deaf children could understand basic emotions, but they had difficulty in interpreting complex emotions. Moreover, the language ability of deaf children affects their understanding of basic emotions. However, it does not reveal a correlation between language ability and understanding complex emotions. Thus, it is necessary to explore further the development of emotional perspective-taking with basic and complex emotions, and any corresponding relations with the language ability of deaf children.

The purpose of this study is to reveal the characteristics of emotional perspective-taking using basic emotions and complex emotions tasks in deaf children using the auditory-oral method. In particular, in order to clarify the relationship between language ability and emotional perspective-taking, it is investigated through non-verbal and verbal tasks.

METHOD

Participants

The participants were 42 deaf children in an elementary school for the deaf, where the auditory-oral method was used in communication. The number of children was 13, 11, 8, and 10 in 3th to 6th grade, respectively.

They were divided into four groups by their grade and language ability. For a criterion of the language ability, the reading-test of 'Toshobunka Test' was performed to the participants. Based upon the test result, the middle (3rd, 4th) and upper (5th, 6th) groups were subdivided into low and high language ability groups: middle grade with low or high language ability groups (ML and MH) and upper grade with low or high ability (UL and UH). The test results and the established four groups with the number of participants in each group are given in Table 1.

Table 1 Average reading-test scores for four groups

Group (Number of participants)		reading-test score
Middle grade	Low group (8)	40.38
(3rd, 4th)	High group (16)	60.94
Upper grade	Low group (6)	39.17
(5th, 6th)	High group (12)	62.75
Total		42
		53.54

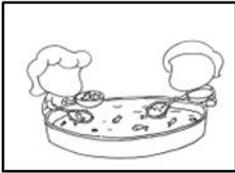
Tasks and procedure

The test consisted of two basic tasks and three complex emotions with story tasks. In these

tasks (e.g. Table 2), we presented some situations with either only non-verbal tasks or verbal tasks, which would elicit some kinds of feeling for a character in the situation. After presentation, we asked the participants, “How does a character feel when he/she considers another’s emotion?” We conducted two set of tasks after giving the correct answer of the practice task to participants for feedback. We gave one score if participants answered correctly with a proper reason at the tasks.

The answer was open type, and also asked for reasons to their answers. One point was awarded when the reasons provided were correct, whereas zero points were awarded when it was incorrect. To eliminate the learning effect, verbal tasks were conducted 2 months later after non-verbal tasks were done.

Table 2 Content of non-verbal and verbal practice tasks

		Non-verbal tasks	Verbal tasks
Basic emotions	Practice task		Rie caught a lot of goldfish at the festival. However, Akira did not catch any goldfish.
	Q	<ul style="list-style-type: none"> How do you think the girl (Rie) felt? How do you think the boy (Akira) felt? 	
Complex emotions	Practice task	 	Akira got a present from Rie at his birthday party. Akira had wished for a robot, so he hoped there was a robot in gift box. When he opened the box, there was a rabbit doll in the box.
	Q	<ul style="list-style-type: none"> How do you think the boy (Akira) felt when he opened the gift box? After the boy (Akira) opened the box, how did he feel about Rie and what will he say to her? <p style="text-align: right;">※ 「Q」 means Question</p>	

RESULTS

Table 3 provides the results of a Kruskal-Wallis analysis and the percentage of scores for each group of children on all tasks. The results revealed that all groups showed almost perfect scores in basic emotions tasks with both non-verbal and verbal tasks. In the complex emotions tasks, however, ML showed a lower percentage of scores than other groups.

Table 3 Percentage of correct answers and mean ranks in each of the tasks by grade and language ability

Group (number of participants)		Non-verbal tasks		Verbal tasks	
		Basic emotion	Complex emotion	Basic emotion	Complex emotion
Grade	language ability	Percentage of correct scores (%) (Mean ranks)		Percentage of correct scores (%) (Mean ranks)	
Middle grade (3rd, 4th)	Low group (8)	100 (21.50)	25.00 (9.00)	100 (21.50)	31.25 (10.63)
	High group (16)	100 (21.50)	90.63 (25.72)	100 (21.50)	90.63 (24.22)
Upper grade (5th, 6th)	Low group (6)	100 (21.50)	50.00 (14.83)	100 (21.50)	58.33 (16.75)
	High group (12)	100 (21.50)	95.83 (27.54)	100 (21.50)	100 (27.50)

** $p \leq .01$ (Mann-Whitney)

Results of non-verbal tasks

To evaluate the differences in complex emotions and total non-verbal tasks scores of the four groups, the Kruskal-Wallis test was used. The results of the basic emotions tasks were excluded from statistical analysis, because all four groups showed 100% scores in both of non-verbal and verbal tasks. It only described the results of the complex emotions tasks analyzed with the Kruskal-Wallis test. We noted significant differences in the complex emotions non-verbal tasks scores of the four groups ($H=20.575$, $df=3$, $p<.01$). A Mann-Whitney test was used for multiple comparison; the significance level of the Mann-Whitney test for a multiple comparison with Bonferroni correction was $p<.017$. A multiple comparison revealed that ML was significant lower scores than MH ($U=12.50$, $p<.01$) and UH ($U=7.50$, $p<.01$). Moreover UL was significant lower scores than UH ($U=14.0$, $p<.01$).

Results of verbal tasks

In the complex emotions verbal tasks scores of the four groups ($H=17.221$, $df=3$, $p<.01$). A multiple comparison revealed the same results with non-verbal tasks that ML was significant lower scores than MH ($U=20.50$, $p<.01$) and UH ($U=12.00$, $p<.01$). Moreover UL scored significant lower than UH ($U=18.0$, $p<.01$).

DISCUSSION

Basic emotions tasks

In basic emotions tasks, all groups could perform the tasks irrespective of grades and language ability. It indicates that deaf children could understand with cartoon sequences or texts which depicted simple situations. These findings are different from the results of a previous study which revealed developmental change in basic emotions in elementary school aged deaf children, and revealed a different understanding of basic emotions when they had

different language ability (Masugi & Chung, 2012). The reasons for this difference may come from the scoring of tasks, because Masugi and Chung (2012) divided six basic emotions however the present study checked only positive emotions or negative emotions for comparing basic emotions to complex emotions. Complex emotions tasks examined whether deaf children could understand character's emotion when character A had a negative emotion but showed a positive emotion to another character out of concern for his or her feelings.

Complex emotions tasks

In complex emotions tasks, even the same grade groups with lower language ability showed lower performance than higher language ability groups in non-verbal and verbal tasks. Previous study (Howley & Howe, 2004) has indicated the effect of language ability because deaf children showed lower performance than hearing children in complex emotions, but they did not explore the effects of language ability among deaf children. Thus, the present results clarify the effects of language ability on understanding complex emotions. However, the present results do not show a statistical difference between MH (91%) and UL (50~58%), but compare the percentage of correct answers given by the two groups. There is the possibility of showing difference by language ability, so we have to further explore by increasing the number of participants.

On the basis of language ability, there are no developmental differences between middle and upper grades in both language ability groups. These results can be explained by two reasons. Firstly, the high language ability groups already showed a high percentage of correct answers. Secondly, UL showed 50% in non-verbal tasks, even though they are in the upper grades. It indicates that they had difficulty in understanding the complex emotions. But ML showed 25% in non-verbal tasks, indicating a possible developmental increase from ML to UL, and the developmental difference of the low language ability group in verbal tasks also needs to be further explored.

Non-verbal and verbal tasks

Effects of the presented tasks (non-verbal and verbal tasks) did not appear in basic and complex emotions tasks. These results indicate that deaf children with high language ability can read necessary information irrespective of visible or language materials. However, deaf children with low language ability also had difficulty obtaining a perspective from visual information that did not contain verbal elements. These results do not agree with the previous study (Masugi & Chung, 2012) which showed upper grade students used situational cues rather than visual cues, because the present study used a non-verbal task which required children to understand that Person A is understanding what Person B feels, a much more difficult task than the previous study's tasks. So, the present complex emotions tasks required reasoning ability rather than simply understanding superficial things. Therefore, this present

study may be reasonably seen to demonstrate language ability difference in deaf children.

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