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INTRODUCTION

➤ In the literature, there are studies showing that individuals using cochlear implants (CI) and individuals with phonological disorders have difficulties in auditory discrimination skills (1, 2, 3, 4). Minimal-pairs are word sets that differ only according to a single phoneme and this difference leads to a change in meaning (5).

➤ Auditory Discrimination Test (ADT), a sub-test of the Turkish Articulation and Phonology Test, is used in the evaluation and follow-up of individuals with phonological disorders (PD). ADT is a standard, reliable and valid test created to reveal the difficulties experienced by individuals with PD by using minimal-pairs.

➤ The purpose of the current study is to compare children with CI and children with PD in terms of the phonemic discrimination ability in minimal-pairs. Thus, the study aims to show that whether a test using minimal pairs will be useful in evaluating the auditory discrimination skills of CI users as well as children with PD.

METHODOLOGY

➤ 9 CI users who have congenital hearing loss and who have had a fitting with a CI within 4 years following birth (89±21 months), 10 children with PD (76±16 months) and 10 children with typical hearing-language development (TD) (81±16 months) were included in the study.

➤ All participants underwent the ADT, a sub-test of the Turkish Articulation and Phonology Test. Consent form was obtained from each participant. For comparison between the groups regarding test performance (score), Kruskal Wallis test, Mann Whitney U test and Bonferroni correction were used.

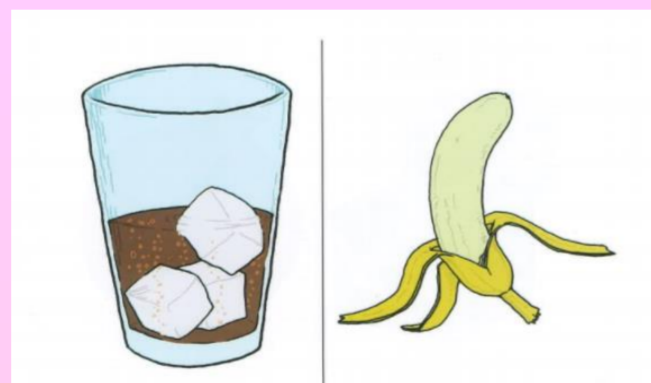


Figure 1. A minimal-pair set

➤ For example, the image shows the minimal pairs of [buz] (ice) and [muz] (banana) (Figure 1). The child is expected to recognize the phonemes [b] and [m] and reach the correct word as well as the correct meaning. Scoring was based on the total number of wrong answers.

➤ Inclusion criteria in the study for CI and PD groups:

➤ The expressive and receptive language skills of the participant should be parallel to their age,

➤ Participant's hearing should be normal (free field audiometry results should be within the normal range for CI users),

➤ For the PD group, the participants should have been evaluated with a specific battery and should be diagnosed; they should have no other accompanying problems,

➤ For the CI group, the participants should have a reported severe to profound congenital hearing loss and had a CI operation within the first 4 years from birth, and there should be no phonological impairment or other problems accompanying hearing loss.

RESULTS

Table 1. Demographic Information

	GENDER		AGE
	Male (n)	Female (n)	Months (mean±SD)
Group with CI	6	3	89±21
Group with PD	4	6	77,5±16
TD Group/Control	5	5	81±1

Table 2. Information About Cochlear Implant Users

Participants	Hearing Loss Diagnosis (Months)	Age of Using a CI (Months)	Age of Receiving Therapy (Months)
1	3	36	42
2	5	12	6
3	15	18	7
4	3	48	7
5	3	18	6
6	3	40	6
7	3	16	12
8	6	20	8
9	6	48	13

Table 3. Mean Scores

	Mean Score
Group with CI	21±8.8
Group with PD	12±6.8
TD Group	3.4±2.3

Table 4. Statistical Results

Groups	p Value
Comparison Between CI & PD	,028
Comparison Between PD & TD	,001*
Comparison Between CI & TD	,001*

*p < 0.016 was considered significant**

Multiple comparisons revealed that there is significant difference between the groups with the disorders and children with TD. However, there was no significant difference between CI users and children with PD.

CONCLUSIONS

In conclusion, the usefulness of ADT during the evaluation and follow-up of individuals with CI was investigated with the current preliminary study. Preliminary study results showed that the test, which can detect the auditory discrimination difficulties of individuals with PD, was also effective for individuals with CI. These findings have shown that ADT can provide useful information in terms of auditory discrimination skills of individuals with CI. In addition, it is thought that the detection of phoneme-pairs that children have difficulty with will be useful in terms of therapy programs. Since this is a preliminary study, further studies with more participants are needed.

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