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# Comprehension of abstract words among hearing impaired children

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Abstract word;
SCTAW;
Academic language

**Summary**

*Introduction:* This study examines the ability and development in the comprehension of abstract words with hearing impaired children. The ability to understand abstract words is quite important for their academic learning and adaptation in their school life. Here, we qualitatively and quantitatively analyzed the development of abstract vocabulary in hearing impaired children using The Standardized Comprehension Test for Abstract Words (SCTAW).
*Subjects and methods:* We examined 75 hearing impaired children (hearing aid users, 61; cochlear implant users, 14; 1st to 10th grade) and 188 children with normal hearing (1st to 6th grade) using the Picture Vocabulary Test (PVT) and SCTAW.
*Results:* The PVT and SCTAW results closely correlated ($r = 0.87$). The SCTAW scores of the hearing impaired group were lower than those of their peers with normal hearing, but the scores improved as their school grade advanced. In particular, their abstract ability began to catch up from the fifth grade. The error trends of abstract vocabulary in the two groups did not significantly differ.
*Conclusions:* The SCTAW was useful as an abstract lexical evaluation of hearing impaired children. The development of an abstract vocabulary did not qualitatively differ between children with or without a hearing impairment.


## 1. Introduction

Prelingual hearing impairment can secondarily cause several different disabilities affecting hearing

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ability, speech intelligibility, as well as language development. Impaired language development may result in academic or occupational problems and easily hamper their quality of life especially after their adolescence period. Therefore, several different vocabulary testing can be available for this age group including Clinical Evaluation of Language Fundamentals, Fourth Edition (CELF-4), Peabody Picture Vocabulary Test (PPVT-III), Expressive One Word Picture Vocabulary Test, Third Edition (EOWPVT), Receptive One Word Picture Vocabulary Test (ROWPVT), Comprehensive Assessment of Spoken Language (CASL), and Reynell Developmental Language Scales III (RDLS III). One of the very important aspect of vocabulary is that include abstract concept. The ability to comprehend abstract words and ideas are essential in the development of academic language skills for hearing impaired children. Bebko [1,2] classified the characteristics of the levels of language proficiency into three levels and language of children starts from more experience-depending language proficiency (Levels 1 and 2), and later develops to abstract usage of language (Level 3 skills) by means of more intended learning process.

Because the acquisition of this abstract vocabulary plays an important role in development of their learning skills, comprehension of abstract words is essential for education in school-aged children. However, no suitable methods have been established to evaluate abstract vocabulary [3]. Recently, a new approach has been developed to examine the ability to comprehend abstract words. The Standardized Comprehension Test for Abstract Words (SCTAW), reported by Haruhara et al. [4], tests abstract words alone. This test enables the assessment of developmental delay or learning difficulties across a wide spectrum of the population, including children with hearing impairment. The present study is the first to evaluate the usefulness of this newly developed test.

In this study, we used the SCTAW to qualitatively and quantitatively evaluate the development of abstract vocabulary among hearing impaired children.

## 2. Patients and methods

### 2.1. Patients

Seventy-nine hearing impaired children were asked to enroll in this evaluation. After preliminary evaluation with the Raven Colored Progressive Matrix Test (RCPM), one child with pervasive developmental disorder (PDD) and three with significant mental

**Table 1** Profiles of hearing aid users

| Grade | CA | N | Hearing levels of better hearing ear | | | Hearing aids | |
|---|---|---|---|---|---|---|---|
| | | | Moderately severe | Severe | Profound | Analog | Digital |
| 2 | 7 | 8 | 0 | 2 | 6 | 4 | 4 |
| 3 | 8 | 8 | 0 | 1 | 7 | 5 | 3 |
| 4 | 9 | 5 | 1 | 1 | 3 | 3 | 2 |
| 5 | 10 | 5 | 1 | 0 | 4 | 2 | 3 |
| 6 | 11 | 6 | 0 | 0 | 6 | 4 | 2 |
| 7 | 12 | 5 | 0 | 2 | 3 | 4 | 1 |
| 8 | 13 | 5 | 0 | 0 | 5 | 4 | 1 |
| 9 | 14 | 10 | 0 | 1 | 9 | 9 | 1 |
| 10 | 15 | 9 | 1 | 1 | 7 | 9 | 0 |
| Total | | 61 | 3 | 8 | 50 | 44 | 17 |

| Grade | Communication methods | | Educational environment | | |
|---|---|---|---|---|---|
| | Sign auditory—aural | Auditory—verbal | School for the deaf | Hard-of hear school | Mainstream |
| 2 | 7 | 1 | 8 | 0 | 0 |
| 3 | 7 | 1 | 7 | 0 | 1 |
| 4 | 4 | 1 | 4 | 0 | 1 |
| 5 | 5 | 0 | 5 | 0 | 0 |
| 6 | 6 | 0 | 6 | 0 | 0 |
| 7 | 5 | 0 | 3 | 2 | 0 |
| 8 | 5 | 0 | 5 | 0 | 0 |
| 9 | 10 | 0 | 10 | 0 | 0 |
| 10 | 5 | 4 | 9 | 0 | 0 |
| Total | 54 | 7 | 57 | 2 | 2 |