

VOCABULARY AND READING COMPREHENSION IN CHILEAN DEAF STUDENTS¹

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ABSTRACT

Reading is a difficult task for most deaf students. Limited vocabulary knowledge has been reported as one of the variables underlying these difficulties (Luckner & Handley, 2008).

The study aimed to describe deaf students' performance on a written vocabulary task and a reading comprehension test; and to determine the correlation between both variables. The sample included 57 students (13-27 years old). They were evaluated using a modified version of TVIP (using written target words) and a widely used Chilean reading comprehension test (CLP). The students were grouped in six levels, according to their teachers' estimation of their reading skill (those in higher education were assigned to the higher level). Raw scores were used for the vocabulary task and percentiles for the reading comprehension test.

Students performance in Vocabulary showed great variability (range: 3-110) forming three groups (means: 13.08; 46.21; 85.6). Reading Comprehension scores were better organized in two groups: low (mean percentile: 13.0) and medium (mean percentile: 46.0). A significant correlation was found between vocabulary and reading comprehension scores ($r=0.68$; $p<0.001$).

Students' performance on CLP is extremely low, considering that teachers' estimation of reading ability was used to select the level of difficulty of the passages. The exception is the case of those considered best readers by their teachers. Vocabulary knowledge is associated with reading comprehension. It is necessary to search for better ways to assess reading comprehension in deaf students to attain a more precise estimation of their reading skills.

INTRODUCTION

In spite of all the efforts in conducting research and improving deaf education during the last 40 years, numerous articles in the field still show deaf students' low level of achievement in written language (Albertini & Mayer, 2011; Bowe, 2002; Luckner & Handley, 2008; Wauters, van Bon, Tellings, & van Leeuwe 2006). In Chile, although there are few studies on the topic, results also show the difficulties faced by deaf students in reading and writing tasks (Lissi, Cabrera, Raglianti, Grau, & Salinas, 2003; Lissi, Grau, Raglianti, Salinas, & Torres, 2001).

It is important to highlight that research in this area is not sufficiently conclusive yet, and there is little agreement among experts regarding the role of different factors to explain deaf students' reading difficulties, as well as about the best way to help them overcome those difficulties (Musselman, 2000; Paul, 2003; Power & Leigh, 2000; Schirmer, 2000).

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Paul (2003) states that deaf students show difficulties both at bottom-up processing level and in their available prior knowledge (e.g., knowledge of written language grammatical structure, topic knowledge or general knowledge). As Luckner and Handley have emphasized, many students who are deaf or hard of hearing “struggle with lower-level skills such as word recognition, syntactic parsing, and understanding vocabulary” (Luckner & Handley, 2008, 32). Numerous studies have documented the limited vocabularies of deaf and hard of hearing children (see Luckner & Cooke, 2010, for a review). Recent studies with samples of deaf and hard of hearing college students have also shown that they score significantly below their hearing peers in vocabulary knowledge (Convertino, Borgna, Marschark, & Durkin, 2014; Sarchet, Marschark, Borgna, Convertino, Sapere, & Dirmyer, 2014).

Considering that a previous study has shown that teachers of deaf students in Chile put a lot of effort on teaching vocabulary during literacy instruction in elementary school (Lissi, Salinas, Acuña, Adamo, Cabrera, & González, 2010), it seems relevant to study the relation between vocabulary knowledge and reading comprehension in a sample of Chilean deaf students. Therefore, this study aimed to describe deaf students’ performance on a written vocabulary task and a reading comprehension test; and to determine the correlation between both variables.

METHOD

Sample

Participants were 57 deaf students (13-27 years old). Most of them (52) attended either a school for the deaf (16) or a regular high school with a mainstreaming program for deaf students (36), the other five had graduated from high school and were enrolled in different types of postsecondary programs. Table 1 shows the number of participants and their age, organized by grade level.

Table 1. Participants’ grade level and age.

Grade Level	N	Age Range	Mean Age
7°	5	13-15	14.2
8°	9	13-17	15.0
9°	11	14-22	17.5
10°	12	16-18	16.8
11°	6	17-21	19.5
12°	9	18-22	19.7
Higher Education	5	21-27	22.2
TOTAL	57	13-27	17.6

Procedure

The students were grouped in six levels, according to their teachers’ estimation of their reading skill. As in the study by Banner and Wang (2010), those students in higher education were assigned to the higher level. Students were evaluated in one single session. The TVIP, the Spanish version of the Peabody Vocabulary Test (Dunn, Padilla, Lugo, & Dunn, 1986) was used first, to assess vocabulary knowledge. The words were presented in written form and the students were asked to point to the picture matching that word from the four images included in each page, such as in the standard oral presentation. Next, reading comprehension was assessed through a widely used Chilean reading comprehension test (CLP), developed by Alliende, Condemarín, and Milicic (2004). The CLP test has eight levels, corresponding to the eight years of elementary school of the Chilean education system. Levels 3 to 8 were used for this study and each one of the six groups of students mentioned above was

assessed using the version of the test that was closer to their reading level according to their teachers. Assessments were carried out by hearing or deaf adults proficient in Chilean Sign Language (ChSL), all of them trained by members of the research team.

For the analysis, raw scores were used for the vocabulary test (TVIP) and, because different levels of the test were used, percentiles were used in the case of the reading comprehension test (CLP).

RESULTS

Performance of the Different Groups of Students

Results were analyzed considering the students grouped according to the level of CLP test used (levels 3 to 8), which matched the reading level assigned by the teachers. Table 2 includes mean CLP percentile and mean TVIP raw score for each group

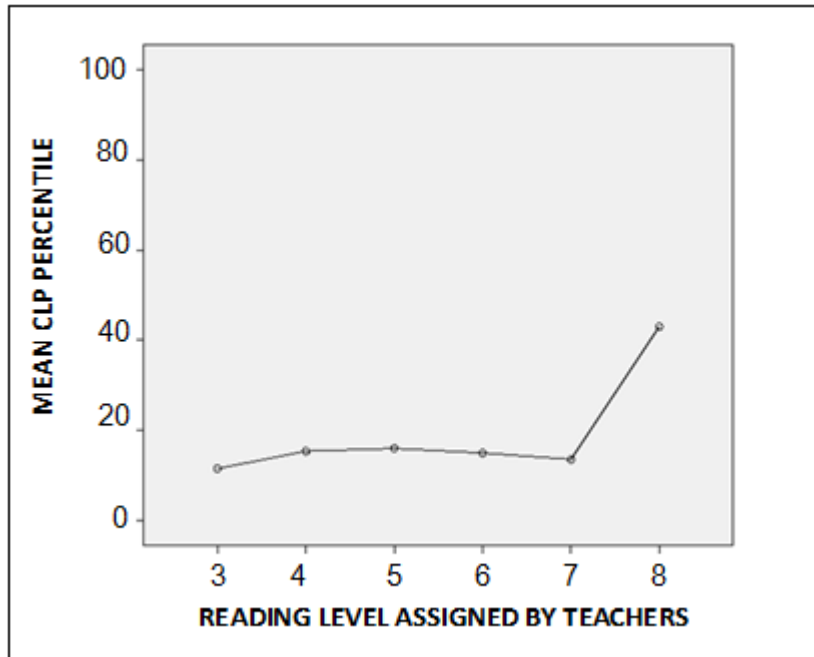
Table 2. Vocabulary test and CLP means for each level of CLP applied.

CLP Level	N	CLP Mean Percentile	TVIP Mean
3	13	11.54	13.08
4	13	15.38	36.69
5	6	16.00	46.17
6	8	15.00	52.75
7	7	13.57	57.00
8	10	46.00	85.60

All groups show very low achievement in the reading comprehension test (CLP), with mean percentiles of 16 or below, except for the group comprised of college students and those considered the best readers by their teachers (Level 8). This last group shows also larger variability, with percentiles ranging from 15 to 75). In the vocabulary test (TVIP), deaf students' scores show a clearer progression from the lowest to the highest reading level.

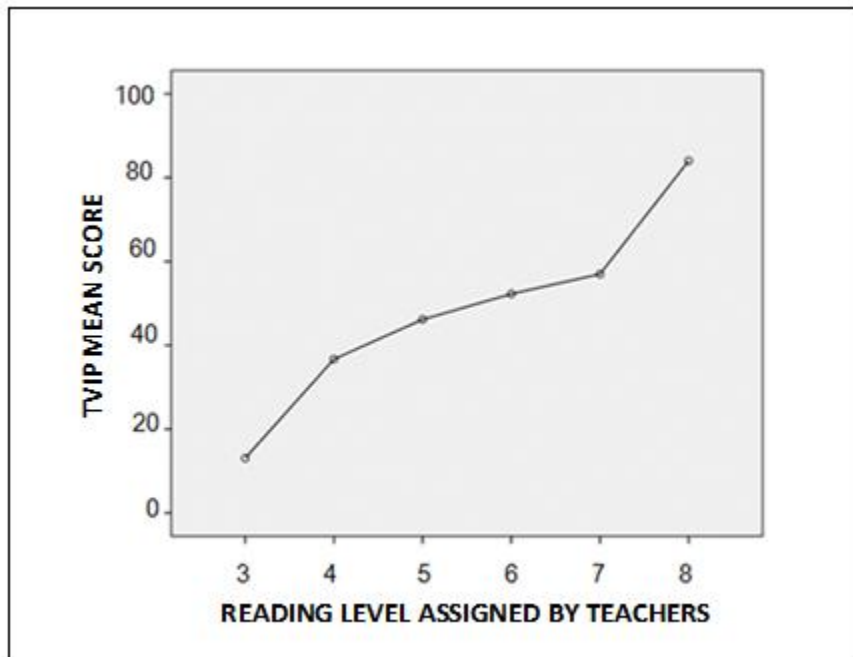
ANOVA was used to compare the performance of the different groups on each test. Significant differences were found when CLP performance in the different groups was compared ($F=10,669$; $p < 0.001$). Post-hoc analysis (Tukey's HSD) showed that the only significant difference is between Level 8 and all the other levels.

Figure 1. Mean CLP percentile for each group of students organized by reading level assigned by their teachers.



Significant differences are also found when comparing the mean raw TVIP scores attained by students in each group ($F=21,542$; $p < 0.001$). In this case, post-hoc analysis showed that we can identify three different groups of students, as shown in the graph in Figure 2. The first one includes Level 3 (mean=13.08); the second includes Levels 4-7 (mean=46.21); and the third one is represented by Level 8 (mean 85.6).

Figure 2. TVIP scores for each group of students organized by reading level assigned by their teachers.



Vocabulary Knowledge and Reading Comprehension

A significant correlation was found between TVIP scores and CLP percentiles, indicating that those students with higher vocabulary knowledge tend to show better levels of reading comprehension ($r=0.68$; $p<0.001$).

In the case of middle and high school students, correlation between reading level assigned by the teachers and students performance on each test was also analyzed. A weak but significant correlation was found between teacher estimation and CLP performance ($r=.387$; $p<.005$), and a strong and significant correlation between teacher estimation and TVIP score ($r=.748$; $p<.001$).

DISCUSSION

The results of this study are consistent with those reported by previous studies, with regard to the limited vocabularies of deaf students and the association between word knowledge and reading comprehension (Convertino et al., 2014; Luckner&Crooke, 2010; Sarchet et al., 2014).

Students' performance on CLP is extremely low, considering that teachers' estimation of reading ability was used to select the level of difficulty of the passages. The exception is the case of those students that had finished high school and those considered best readers by their teachers. It is interesting that teacher's estimation of reading level is highly correlated to vocabulary knowledge, and presents a weaker correlation with actual reading comprehension performance. Considering also that students present higher variability in their vocabulary scores than on the percentile attained on the reading comprehension test, it seems necessary to find better ways to get a more detailed picture of a deaf student reading performance. In this sense, a possible limitation of the study is that a traditional reading test designed for hearing students was used.

The results show that CLP percentiles allow us to identify two different groups of students. In general, for the first group, comprised by those students presented with the levels 3 to 7 of the test, the texts were extremely difficult for them, and most of the students' performance was below percentile 20. The group presented with level 8 texts performed significantly better than all the others. These students seem to have achieved enough competence to deal with texts in a more independent way, therefore reaching the highest mean percentile in spite of have faced the most difficult texts.

The students' performance on TVIP suggests that this test is tapping into differences in written language skills among students that are somehow hidden if we only look at the percentile they achieve on the reading test. However, this observation has to be made with caution, since both tests require different types of skills and in the first case we are looking at raw scores and in the second we are considering percentiles, based on the standardization sample of hearing students used when the tests was constructed.

The low levels of reading comprehension in the sample are consistent with results from other studies on Chilean deaf students (Lissi et al., 2001; Lissi et al., 2003). They point to the need of improving written language teaching, in order to make it possible for deaf students to leave school with levels of reading comprehension that provide them with better opportunities in the job market and to pursue further education. They also show that is important to find better ways to assess different written language skills in deaf students if we want to be able to make more precise analysis of their reading difficulties.

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