

HOW SIGN MODE OF COMMUNICATION IMPROVES RECEPTIVE AND EXPRESSIVE SEMANTIC SKILLS IN HEARING-IMPAIRED STUDENTS

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Abstract

Sign language in countries like Kosovo and Albania was recognized as an official mode of communication among hearing-impaired persons in the last two decades. Nevertheless, in Albania until recently students were using only oral mode of communication in classrooms of special schools that they attended, while in Kosovo students in special schools were using sign language as a dominant mode of communication. The objective of our research was to assess the difference between receptive and expressive semantic skills based on one main variable, the mode of communication. In our research participated overall 50 students aged 8-15, divided as 8-11 (younger) and 12-15 (elder), using the signed or oral mode of communication, all visiting the residential schools for children with hearing loss in Kosovo and Albania, by using Toss-p test primary for receptive and expressive semantic skills, including five areas, labels, categories, functions, attributes, and definitions, translated and adapted in the Albanian language. The large difference in performance between subjects that use the sign mode of communication and oral mode of communication in favor of signers in receptive tasks is a high indicator that sign language helps subjects to understand labels and attributes. The difference was evident for expressive tasks in favor of signers, where signers were able to state attributes, functions, and definitions better than subjects with the oral mode of communication, which means sign language has helped them to express the meaning of the areas. This indicates the importance of presenting sign language as early as possible.

Keywords: sign language, hearing impairment, expressive and receptive semantic skills, Toss- p test

Introduction

We will start the introduction with a citation: “Receptive language involves receiving and decoding or interpreting language, and expressive language is underlined as the encoding or production of a message” (McIntyre, Hellsten, Bidonde, Boden, & Doi, 2017). When we debate about receptive language in human beings, a plethora of studies have concentrated their objective on children’s receptive skills, since the largest part of a child’s language development occurs in the first 5 years of life when brain development is most rapid, and children must develop their receptive and expressive language skills to become effective communicators (Ramadani Rasimi & Skubic, 2020). Receptive skills are closely related to one major variable, the availability, and accessibility of parent-child communication, that according to Marschark (2001), infants can make use of a variety of available information sources to give the meaning of individuals and events in the world, so even though a deaf infant may have a hearing mother or parents, most cases have shown a delayed communication with the infant, it is the quality of communication that matters to set up a sufficient language base (Ramadani Rasimi & Skubic, 2020). In addition, statistics show that 90 % of deaf infants come from hearing parents, and in many cases, they lack full access to a foundational language, because they either lack exposure to fluent sign language models or they lack complete access to a spoken language, either way, they lack the necessary automatization of lower level language processing skills – required for academic success (Beal-Alvarez J. , 2014). In general, most of the studies (Enns & Herman, 2011; Enns & Zimmer, 2009) came to results that receptive skills increased with age and those

who were exposed to fluent sign language models earlier and more frequently scored higher across ages (Ramadani Rasimi & Skubic, 2020). It is the same situation with expressive skills, respectively the last decade made it possible to document the expressive skills in signing language (Mann, Roy, & Marshall, 2013; Beal-Alvarez J. , 2016; Rinaldi, Caselli, Di Renzo, Gulli, & Volterra, 2014), and since the majority of the subjects were native signers, the investigation shows that they tend to have language development parallel to their typically hearing peers (Ramadani Rasimi & Skubic, 2020). However, the question arises for children that are not born in signer families that present 95 % of the hearing impaired population, which mode of communication to choose, what are the differences and similarities with spoken language? It is well established that the oral approach aims to facilitate spoken language and inclusion with normal-hearing peers, while the visual approach focuses on facilitating the process of language acquisition in these subjects (Fitzpatrick, et al., 2016). In addition, Teuta (2020) in her doctoral thesis has highlighted the set of similarities between the two languages, especially for the pre-lingual period based on a review of Laura Ann Pettito, (1994), as follows:

- 1) Both hearing and deaf babies used vocal jargon babbling (which occurs from 12 to 14 months)
- 2) Deaf babies produced phonologically possible, but non-existing forms of the ASL lexicon, just as hearing babies produce phonologically possible but a non-existing forms of the spoken language they learn.
- 3) There was continuity between phonetic and syllabic forms used in deaf infant manual babbling and their first signs. Like hearing infants, deaf infants produce their first signs from the pool of phonetic and syllabic types rehearsed in their babbling.
- 4) First signs and first words occur at similar ages (10-12 months) and the quantity is also similar, there is little variation (same hand shapes, same reduced set of consonants and vowels)

Furthermore, Laura Ann Pettito (2000) has tried to demonstrate that the process of sign language takes the same path as the spoken language and that the human propensity for language is not modality-dependent. Lillo-Martin (2008) adds that such conclusions and studies would not be necessary if sign languages were considered anything less than full, natural human languages with the same biological foundations as well as similar social environments (Lillo-Martin, 2008). However, the debate about whether sign language is a natural human language is still in the stir even though many studies have tried to prove its naturality by exposing the difference between signs and gestures (Goldn-Medaow & Brentari, 2015), and that gestures are present even in hearing children where the spoken language is developed (Capirci, Iverson, Montanari, & Volterra, 2002). It was often assumed that all deaf people across the world used a kind of universal, primitive system of gestures and pantomime (Vermeerbergen & Herreweghe, 2010), since both gestures and signs are produced manually. In addition, sign language is defined as manual linguistic systems with lexical, morphological, and morpho-syntactic structures analogous to those found in spoken languages (Capirci, Iverson, Montanari, & Volterra, 2002), however not all sign languages in the world, used by hearing impaired individuals are standardized like the example of American Sign Language ASL, British Sign Language, and others, some are just unified since they lack the system of rules that governs how linguistic components must be combined, like Albanian Sign Language and Kosovo Sign Language. Standardized or not, sign language helps hearing-impaired children in developing communication skills, since it takes longer for speaking children to develop sufficient articulatory control to produce utterances that can be recognized as words than for signing children to develop comparable control (Lillo-Martin, 2008). What we can conclude is that early exposure to sign language helps children to develop more effective communication skills, however, this is an option that the parents need to be informed about (Ramadani Rasimi & Skubic, 2020), so they would make the best optimal decision for their children. In many cases,

introducing sign language and spoken language (later written simultaneously to the child with hearing loss only improves its cognitive abilities to develop better communication skills, and this process is called bilingualism, where there is one dominant mode of communication (for example sign mode) over the other (for example English). In the case of Auslan and English Language (Johnston & Schembri, 2007), researchers have made a strict distinction regarding the grammar structure of the languages, therefore it is considered that a child that is a competent user of both languages is bilingual. As result of long debate on linguistic advantage on deaf children language development, respectively sign mode over spoken or vice versa, has led educators to create bilingual programs, to improve reading and comprehension skills (Tang, Lam, & Chris Yiu, 2014).

In order to answer the question to which level children with hearing loss differ from hearing peers, as can be seen from the discussion above, it is crucial that the right assessment tools or instruments be administrated to the children, regarding all the factors influencing the results. For the interest of the present study, we consulted the literature (Hermans, Knoors, & Verhoeven, 2009; Haug, 2017; Prezbindowski & Lederberg, 2003; Haug, 2005; Haug & Wolfgang, 2007) on this topic and based on our sample that was available to participate in this study, we examined thoroughly a standardized test of semantic receptive and expressive skills where the subjects had the possibility to read the question and simultaneously to lip read/ hear it or sign read it, which frees the subjects from comprehensive and production restrictions (Ramadani Rasimi & Skubic, 2020). This paper is part of a larger doctoral thesis, however, in this paper, we present the results regarding only one dichotomous variable, the mode of communication. The main **objective** of our research was to analyse whether there is a difference in the performance of receptive and expressive semantic skills among hearing-impaired children using a different mode of communication, from which we derived two research questions:

1. Do children with hearing loss, using oral or sign mode of communication differ in their receptive semantic skills?
2. Do children with hearing loss, using oral or sign mode of communication differ in their expressive semantic skills?

Materials and methods

Based on our research objective and research questions, the **mode of communication** has been considered a crucial variable in this research, since the subjects come from two different special schools, where in one the dominant mode of communication is sign language (Kosovo), while in the other (Albania) the main mode of communication is the oral mode, respectively lip reading which is why we carefully framed the methodology since it required a convenient sample, only children with hearing loss. Literature has shown that native signers show better results on semantic tests (Marshall et al., 2017), nevertheless, subjects in the present study are not native signers since they are not born in deaf families. For that reason, we chose N=50 children with hearing impairments, aged 8- 15, grouped into two groups, younger group 8-11 and elder group 12-15, all pupils of a residential school for children with hearing impairments from Prizren, Kosovo and Tirana, Albania. They were all assessed by using a standardized test of semantic skills, respectively Toss- p test for receptive and expressive semantic skills (Bowers, Logiudice, Huisinigh, & Orman, 2002), translated and adapted into Albanian language (Ramadani Rasimi, Memedi, Havziu, & Agai, 2020), which includes five areas of semantic skills, labels, categories, attributes, functions, and definitions. It consists of twenty realistic line illustrations depicting natural, real-life scenes, based on six common themes: learning and playing, shopping, around the house, working at school, eating and health and fitness, hence the authors considered these scenes and themes so as to represent aspects of everyday life that are familiar and important to preschool children, however when it comes to hearing impaired

children, based on a literature review for a delayed semantic skills in hearing impaired children, these themes are appropriate for older children as well (Bowers, Logiudice, Huisingh, & Orman, 2002).

Ethics

Ethics in the study was highly respected by ensuring information about the goal of the research and getting approval from participants, parents and the principal to be part of it. Because children were underage, approval for their participation was requested from their parents or their primary guardians and the school principal. The researcher took into consideration the direct approval of the children who attended. None of the children were obliged or forced to be part of the study. She and the translator for sign language respected the psychological, emotional, and physical state of the children while testing, so if they appeared tired from the testing procedure, she would give them a break and have a short relaxing conversation.

The original measuring tool is a standardized test established for testing 1510 children within a range between 4 years, 0 months, and 8 years, 11 months, but could be administrated to respondents older than nine if their overall receptive and expressive semantic skills are within the performance range of the test (children with hearing impairment is such a category) (Bowers, Logiudice, Huisingh, & Orman, 2002). To use this instrument in the current thesis, it was necessary to adapt the test in order to test its reliability, which gained consent from the production house and the authors.

Results

This section presents a statistical analysis of the results regarding the mode of communication and variable for receptive semantic skills of subjects that participated in the research respecting the order of research questions. Our data was calculated by using different statistical analyses, starting with the descriptive statistic for demographic variables, and continuing with inferential statistics for calculating the difference of means (Ramadani Rasimi, Memedi, Havziu, & Agai, 2020). Since we had a nonparametric distribution of the score, we used nonparametric tests to calculate the difference of means between two groups of the main criterion variable, mode of communication. In order to confirm these assumptions for the current study, we will present a Mann-Whitney analysis to see if there is a difference of means between subjects that use oral mode as a dominant mode for communication and sign language as a dominant mode of communication for receptive semantic skills.

Table 1 Differences of arithmetic means between subjects that use oral mode and sign language for each area of receptive tasks

	Mode of communication	Mean Rank	Z scores	Mann-Whitney	Sig
A-identifying labels	1 oral	17,18	-3.433	135.500	.001**
	2 sign	31,05			
B-identifying categories	1 oral	25,90	-.227	292.000	.820
	2 sign	25,23			
C-identifying attributes	1 oral	19,05	-2.706	171.000	.007**
	2 sign	29,80			
D-identifying functions	1 oral	21,63	-1.627	222.500	.104
	2 sign	28,08			
E-identifying definitions	1 oral	30,23	-1.941	205.500	0.52
	2 sign	22,35			

Receptive total	1 oral	19,25	-2.489	175.000	0.13*
	2 sign	29,67			

[*Note: Correlation is significant at $p < .01$ (**), * Correlation is significant at $p < .05$ (*)]

[A-identifying labels; B- identifying categories; C- identifying attributes; D- identifying functions; E- identifying definitions; RT- receptive total]

Table 1 shows that *there is a statistical difference* in the composite variable receptive semantic skills between subjects that use oral mode as dominant mode of communication and subjects that use sign mode as a dominant mode of communication because the Mann-Whitney score showed to be 175.000, with a statistical significance at level $p > 0.05$, i.e. $p > .013$, which means that subject using sign language as a dominant mode for communication tend to perform better than oral users. As can be seen, the statistical difference is due to statistical difference in two areas, identifying labels, and identifying attributes as well.

Table number 2 presents a Mann-Whitney analysis of the difference of means between subjects that use oral mode as a dominant mode for communication, and sign language as a dominant mode for communication for the criterion variable expressive semantic skills.

Table 2 Differences of arithmetic means between subjects that use oral mode and sign language for each area of expressive tasks

	Mode of communication	Mean rank	Z scores	Mann-Whitney	Sig
F-stating labels	1 oral	37,23	-4.703	65.500	.000**
	2 sign	17.68			
G-stating categories	1 oral	25.23	-.111	294.500	.912
	2 sign	25.68			
H-stating attributes	1 oral	13.88	-4.922	61.500	.000**
	2 sign	33.45			
I-stating functions	1 oral	14.08	-4.621	71.500	.000**
	2 sign	33.12			
J-stating definitions	1 oral	17.33	-3.340	136.500	.001**
	2 sign	30.95			
Expressive total	1 oral	19.03	-2.578	170.500	.010**
	2 sign	29.82			

[*Note: Correlation is significant at $p < .01$ (**), * Correlation is significant at $p < .05$ (*)]

As can be noticed on table number 2, *there is a statistical difference* in the expressive semantic skills between subjects that use oral mode as dominant mode of communication and subjects that use sign mode as a dominant mode of communication because the Mann-Whitney score is -2.578 with a statistical significance at level $p > 0.01$, i.e. $p = .010$, and based on the ranks, the signers have performed with greater success than the subjects that use oral mode as the dominant mode for communication. The difference of means can be noticed in all four areas of expressive semantic skills, starting with stating labels where subjects using the oral mode of communication outperformed signers, while in stating attributes, stating functions, and stating definitions signers outperformed subjects using the oral mode of communication.

Discussion

In this section, we discuss the results regarding the main variable upon which the first two research questions were formulated, mode of communication. There are several investigations that have confirmed a higher level of performance, receptive and expressive semantic skills of subjects with hearing impairment who use sign language as a dominant mode for communication, for this reason we considered it as crucial to analyse whether or not there is a

difference between the subjects with different mode of communication who were participants in this study. We will refer to table number 1, and conclude that there is a significant difference in receptive skills in favour of subjects who use sign mode as a dominant mode of communication which means that sign language probably improves the comprehension of a subject with hearing loss (Ramadani Rasimi & Skubic, 2020). There are many studies that confirm our results ((Navarrete, Caccaro, Pavani, Z.Mahon, & Peressotti, 2015; Li, et al., 2015; Mayberry, 1998), where in general, subjects using sign language as a dominant mode of communication performed significantly better than subjects using the oral mode of communication. This significance is due to the major difference in two areas of receptive tasks, identifying labels and identifying attributes, where subjects with a sign mode of communication have scored higher than subjects with an oral mode of communication. In an in-depth analysis of every area by using Chi-square, the significance of the difference in the area of identifying labels comes from the significance of the difference in three subtasks, when the subject was asked to show mechanics, which means that sign language probably helped the subjects to understand what is a mechanic, the second was to show to a mail carrier, and the last to show to a customer, where subjects with sign mode of communication have point out correctly to the items in the picture stimuli book, which means that they didn't have difficulty in understanding what a mail carrier and a customer means. The second area, identifying attributes, is due to the significance of association performed on the following subtasks, show me something that is woven and show me something that has the address on it, hence the subject had to point to objects that had this characteristic and subjects with sign language mode as the dominant mode of communication answered correctly compared to subjects with the oral mode of communication.

Based on the discussion above, regarding the general results of receptive total scores, we can say that there is a difference between subjects who use the sign mode of communication and subjects who use the oral mode of communication in favour of signer, where signers have generally performed with higher accuracy, which means sign language improves the comprehensive language in hearing-impaired subjects., in other words, the iconicity of the signs helps PCHI to understand and state the semantics of the language in general, which is why it should be introduced as early as possible (Ramadani Rasimi & Skubic, 2020). Introducing a bilingual mode of communication improves receptive and expressive semantic skills, respectively a study conducted by Giezen and Emmorey (2016) proved this statement. They tested early and late bilinguals with a semantic decision and lexical decision task with ASL signs, English words, and ASL-English code-blends, and came to the conclusion that facilitation compared to their dominant language, English, was only observed for the early bilinguals.

Continuing with the second research question regarding expressive skills and mode of communication, the test of differences has resulted in statistical significance for subjects that use sign mode as the dominant mode of communication. Moreover, expressive skills were performed with statistical significance of association with mode of communication in three areas, stating attributes, stating functions, and stating definitions, in favour of sign mode. More precisely, in stating attributes SS performed with higher accuracy in four subtasks when asked to state what his skeleton is made of, what grocery bags are made of, state two parts of a lawn mower, and how pepper taste compared to SO. The second is, stating functions, and again SS outscored SO in the following subtasks when asked to state what we do with a scale, what an announcement is for, and what is a map for, which means they are more aware of the functions of the stated objects compared to SO. The third area in which SS outscored SO is stating definitions with the following subtasks when asked to express what healthy means, what a toaster means, and what it means to put away, which indicates that abstract notion is probably difficult for SO to state. In addition, only in one area, stating labels, SO performed with higher accuracy when asked to state the notion for the globe, barbeque, eggs box, couch, and a stapler

after being pointed out by the researcher compared to SS, which means they understand their meaning, have a higher level of vocabulary and language performance than SS. There is one area that didn't show any difference between SS and SO, stating categories, however one subtask, when asked to state a category for the objects plate, cup, SO outscored SS, which means they knew that those objects are food utensils better than SS. In a longitudinal research (Klatter-Folmer, Kolen, Hout, & Verhoeven, 2006) conducted with six deaf subjects using Sign Language of Netherlands and spoken Dutch language, came to the conclusion that with time they improved their communication skills in both languages, which can lead to speculation that sign language does not have an advantage of spoken language for deaf subjects. However, these are results of case studies, it cannot be generalized for a larger group, since they were introduced to both languages at early age.

According to the discussion above, we can conclude that subjects with sign mode of communication performed higher in expressive semantic skills compared to subjects with oral mode of communication, which indicates a probability that sign language helps expressive language in hearing impaired subjects.

Conclusion and further implication

The objective of the research was not only to evaluate the weakness and strength of general areas of semantics of subjects with hearing impairments, but it was also to analyse the main variable that literature says make difference in their performance. In order to realize this research, we assessed hearing-impaired subjects from two residential schools, since we thought it was important to detect what improves their language acquisition in terms of semantics. We conducted this research by using an instrument that had never been used before in the context of the Albanian language. After its adaptation, the test resulted in acceptable reliability in the Albanian context, which made it used not only for this current research, but also for other research and individual use by speech therapists and special education teachers, taking into consideration that in both countries there is no network of early intervention, and children with hearing impairment are detected after 2 years of age.

We shall address the conclusion based on research questions and results, and one of the first conclusions is that sign language improves the acquisition of language components, respectively semantics. The large difference in performance between subjects that use the sign mode of communication and oral mode of communication in favour of signers in receptive tasks is a high indicator that sign language helps subjects to understand labels and attributes. The difference was evident for expressive tasks in favour of signers, where signers were able to state attributes, functions, and definitions better than subjects with the oral mode of communication, which means sign language has helped them to express the meaning of the areas. For this reason, ***we would highly recommend that every child that is identified with hearing loss, has the chance to be assessed by an early intervention team for the benefits of using sign language, or sign cues as prompts in increasing and improving language acquisition.***

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