Evalution and Intervention in the Linguistic Structures of Children's Language

Diana Alina BUGANU [1]*

Abstract

The aim of the research aims at evaluating the linguistic structures at semantic, morpho-syntactic, pragmatic level and the psycho-speech therapy intervention in order to remedy the deviation from the standard language development. The research methodology is of experimental type, in order to verify the influence of the speech therapy intervention program on the language development of preschoolers. The research was conducted on two groups of children: 5-7 years old, with language disorders (pronunciation-polymorphic dyslalia) and children with typical development. It was applied Bankson-2 Language Assessment Test (BLT-2) to examine the level of development of linguistic structures at semantic, morpho-syntactic, pragmatic level. The statistical analysis of the research results highlighted significant differences between children with language disorders and those with typical development.

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[1] PhD Student, Ion Creanga State Pedagogical University of Chisinau, Chisinau, Moldova, E-mail: diana.buganu@gmail.com
* Corresponding author

1. Introduction

In the development of man as a superior biological organism from a cognitive and affective point of view, communication had a defining role. Being a gregarious being, whose existence is dependent on the support of other individuals in the group, man had to develop powerful tools to signal intentions, opportunities, dangers, affectivity, to be understood by other members of the group and to contribute to general well-being. Communication, with its implementation tools, was the solution to ensure the cohesion of the group, the distribution of tasks and the efficient exploitation of opportunities.

The efficiency of communication depends on the sender, the receiver, but also on a series of environmental factors that become part of the process (Păunescu, 1973; Verza, 2009). In addition to environmental factors, individual, physiological and psychological factors also intervene, sometimes in a way that greatly jeopardizes the individual's chances of a normal life and achieving well-being. Another set of elements that constitute a separate group are language and communication disorders. The interventions in these disorders are made according to each case, taking into account the type and severity of the deficiency, the level of mental development of the subject, his age, but especially the etiologic of the disorder and its manifestations (Păunescu & Mușu, 1984; Vrăsmaș, 2012). The causes that led to a language disorder cannot always be established with certainty, especially since it is most often a combination of factors, the concentrated action of which led to this manifestation.

Researches conducted by Păunescu (1973), Verza (2009), Olărescu (2008), Cucer (1992) showed that the disorders in speech are experienced by the child as an inability to express himself correctly, which causes over time a series of unstable behavioral manifestations, from one situation to another, affecting the child's personality and relationships between him and adults: emotional hypersensitivity, arousal psychomotor, state of intellectual and physical fatigue, the tendency to underestimate one's own possibilities in action, etc. Vrăsmaș and Preda (2010) observed that the presence of language disorders, if not treated properly, can predispose to serious disturbances of the regulatory and self-regulatory function of language, which prevents a good organization of the psychic life, the actualization of the self being realized deficiently and determining a decrease of the self-confidence. In the absence of adequate social interactions, the child's ability to learn to identify and name his own emotions and feelings is affected, coming to incorrectly appreciate the situations of interaction, and the language itself has no conditions to develop properly.

Delays in language acquisition and development require both proper diagnosis and appropriate intervention, as well as preventive measures (Olărescu, Buganu, Madan, 2020). We initiated an experiment in which preschool children participated, the age between 5-7 years with speech disorders (pronunciation-polymorphic dyslalia) and children with typical development, respectively 80 and 70. Next we refer to the results received on the structures segment in the Bankson-2 test (BLT-2), administered in the initial and final assessment. The purpose of the research is to examine the level of development of linguistic structures at semantic, morpho-syntactic and pragmatic level.

The main hypothesis of research are following: There are significant differences between preschoolers with TL and typical preschoolers in terms of language development on the semantic, morphological, syntactic, pragmatic level.

2. Methodology

2.1 Participants

The research was conducted on two groups of children: 5-7 years old, with language disorders (pronunciation-polymorphic dyslalia) and children with typical development. The evaluation of the language at semantic and morpho-syntactic level is made by reference to the chronological age.

2.2 Research instruments

The *BLT - 2 test* is a standardized test for reviewing language skills, which measures the primary expressive language skills of children between the ages of 3.0 and 6.11 years, for three areas of ability: semantics, morpho- syntactic and pragmatic Bankson WN. The test contains 20 sections with 6 items each, which are included in the two main subtests and an optional subtest: (1) semantic knowledge; (2) morphological and syntactic rules; (3) pragmatic knowledge. The test is intended to assess expressive language, but in addition, the Semantic Knowledge subtest also provides the opportunity to observe receptive language (Bankson, 1990).

The *Semantic Knowledge* section evaluates the language in terms of *content*, respectively the knowledge of vocabulary in its expressive form, but also impressive: body parts, nouns, verbs, categories, functions, prepositions, opposite words (antonyms).

The *form of the language* is evaluated through the subtest referring to the morphological and syntactic rules, on several topics: pronouns (depending on the subject / direct complement; possessive pronouns), verb tenses (present, perfect compound) and verb uses (auxiliary verbs, modal verbs), plural nouns, comparative and superlative adjectives, negative and interrogative sentences.

The supplementary subtest, on *Pragmatic Knowledge,* reflects the *use of language* and is based on the concept that the meaning of sentences is derived from the contexts or situations in which they are used (content and form must be engaged in appropriate social contexts). The items in this subtest reflect four primary aspects of pragmatic functioning: rituals (greeting, introductory formulas), information (ability to ask questions and answer with relevant information), control (engaging in conversation), imagination (engaging in a social role).

In the administration of the test, a number of 26 plates with different images (picture book) are used. The test is applied individually, with no time limit. For each correctly made item, one point is awarded. A maximum of 42 points can be obtained in the *Semantic Knowledge section*, in the *Morpho-Syntactic Rules section* - 72 points, and in the *Pragmatic Knowledge* section a maximum of 6 points, and in total a maximum of 120 points can be registered. Based on the gross scores obtained, the standard scores of the subtests can be calculated (available only for the first two sections), respectively the coefficient for the *BLT-2 test.* This coefficient measures a child's ability relative to the general functioning of language, and from this perspective we can distinguish several levels of performance: *higher level* (values of standardized scores over 14), *level above average* (value range of scores 13-14), *medium level*(scores between values 8-12), *below average level* (scores between values 6-7), *low level* (standardized scores below value 6).

3. Results

3.1. Results of the Bankson-2 Language Assessment Test (BLT-2)

The test presents standards for linguistic performance only for the first two areas of language development, namely the semantic and the morpho-syntactic area. Depending on the results of this test, decisions can be made regarding a more detailed investigation of the language, on the three areas of abilities (test constructs) or the need for a special intervention on the language.

The results obtained in the three subtests (*Semantic knowledge; Morpho-syntactic rules; Pragmatic language*) revealed differences in language performance in TL preschoolers compared to typical preschoolers. The scores in the *Semantic Knowledge* subtest include performances recorded from the point of view of expressive language, but also of impressive language. We present below the central trend of the data, in a statistical processing based on the raw scores for the three sections of the BLT-2 test. The average percentage values were used to make the graphical representation.

Table 1. Average values of language skills in groups *D and N, BLT-2 test*

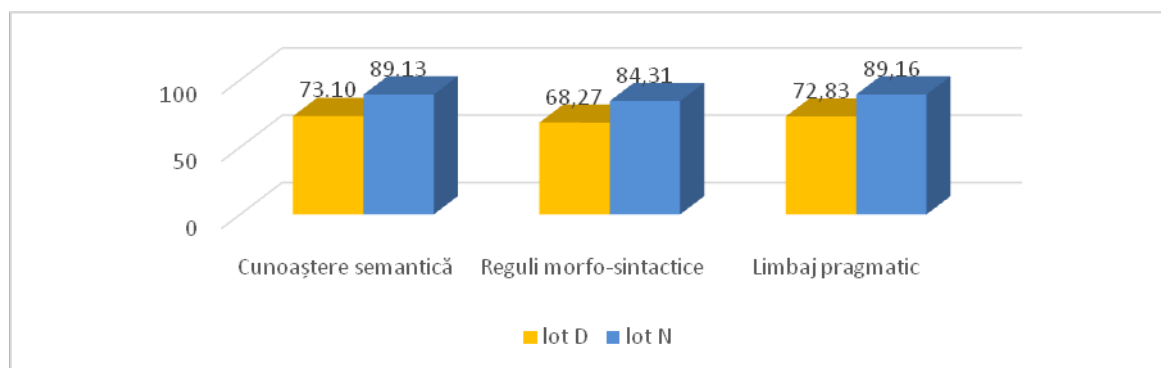|	Lot D		Lot N	
	Gross average	*Percentage average*	*Gross average*	*Percentage average*
Semantic knowledge	30.71	73.10	37.44	89.13
Morpho-syntactic rules	49.16	68.27	60.71	84.31
Pragmatic language	4.37	72.83	5.35	89.16

Figure1. Average values on language skills of preschool children in groups D and N, in the BLT-2 test

The *content of the language* is represented, in this test, by the child's vocabulary, which is seen as a fundamental indicator of *semantic knowledge*. The semantic knowledge section (first subtest) focuses on the following vocabulary topics: body parts, nouns, verbs, word categories, functions, prepositions, opposite words (antonyms).

The results obtained at *Semantic Knowledge* revealed that from the point of view of semantic knowledge the registered gap is larger in TL preschoolers, as it results from the processing of the raw scores obtained by the subjects. The vocabulary of typical preschoolers is better developed (M = 37.44), compared to that of TL preschoolers (M = 30.71), the differences in language performance from the perspective of learning the language content being obvious at this level, between the two groups. The application of the *t test* for independent samples allowed the delimitation of the significance of the differences between the average values of the linguistic performances at semantic level. From the perspective of vocabulary acquisition, the value of the t test indicated statistically significant differences between the performances of preschoolers in the two categories (t = 10,129, at p = 0). The values of the *f Levene* test were statistically insignificant, so the condition of homogeneity of the group variances was satisfied (f = 2,222; p = 0.138).

The *form of the language* indicates the morphological and syntactic rules involved in understanding and using the language and is assessed through the second subtest of BLT-2. A number of aspects are appreciated such as: pronouns (depending on the subject / direct complement; possessive pronouns), verb tenses (present, perfect compound) and verb uses

(auxiliary verbs, modal verbs), plural nouns, comparative and superlative adjectives, sentences negative and interrogative.

At the level of mastering the *Morpho-syntactic Rules* involved in understanding and using language, the performances of typical preschoolers are superior (M = 60.71), compared to those of TL preschoolers (M = 49.16). The value of the t test for independent samples, calculated at the level of learning morpho-syntactic rules, revealed a statistically significant difference between the group of TL preschoolers and the group of typical preschoolers (t = 8,067; p = 0), given that it is verified the condition of homogeneity of the variances of the two groups (f = 0.374; p = 0.542).

The *use of language or Pragmatic knowledge* is based on the concept that sentences derive their meaning from the contexts in which they appear, in other words, the content and form of the language must be engaged in appropriate social contexts. The third subtest investigates primary aspects of pragmatic functioning by categories: rituals (greeting, introductory formulas), information (asking questions and answering with relevant information), control (engaging in conversation), imagination (engaging in a social role).

The *pragmatic functioning / knowledge of the language*, respectively the way in which the language content and the form are adequate to the social and communication context, registered a different development in the two categories of subjects, the TL preschoolers presenting inferior performances at this level (M = 4.37), compared to typical preschoolers (M = 5.35). The application of the ***t test*** for independent samples, at the level of language pragmatics, highlighted statistically significant differences between the performances of the subjects from the two samples (t = 6,642; p = 0). The value of the *Levene test* was insignificant, the two groups having homogeneous variances (f = 2.783; p = 0.097).

The results obtained by applying the *t test* for independent samples, at the BLT-2 test, were completed by calculating the *Cohen d* indicator, applying the formula for unequal groups, in order to detect the *effect size* between the presence of *polymorphic dyslalia* and the development of *language skills* in high school. Regarding language skills, analyzed multilevel (semantic, morpho-syntactic, pragmatic), significant values of the *d Cohen* indicator were recorded for all types of language skills.

From the point of view of *Semantic Knowledge*, the value of d Cohen was 1.66, which denotes a very strong influence of polymorphic dyslalia on the ability to acquire some basic notions (vocabulary). When knowing the *morpho-syntactic rules*, the calculated Cohen d value was 1.32, thus highlighting a very strong influence of polymorphic dyslalia on the development of morpho-syntactic abilities. In the *Pragmatic Language* subsection, the Cohen indicator was 1.08, which indicates, also at this level, a strong influence of polymorphic dyslalia compared to the *pragmatic language skills* of the preschoolers investigated.

The BLT-2 language assessment test allowed the delimitation of a standardized profile of the linguistic development of each subject in the fields of Semantic Knowledge (vocabulary) and the acquisition of morpho-syntactic rules, by relating linguistic performance to chronological age (in our case, the age range of 5-6 years). The transformation of raw scores into standardized scores in the first two sections of the BLT-2 test (Semantic knowledge; Morpho-syntactic rules) led to highlighting the level of language development depending on the distribution of subjects' performance in these two areas. At the level of our investigation, language development was at the following levels: below average level (between values 6-7); average level (between values 8-12); level above average (value range 13-14); higher level (values over 14).

Table 2. Framing the performance of the subjects from groups D and N by development levels of the Semantic knowledge (vocabulary) and of mastering the *Morpho-syntactic Rules*, in the *BLT-2 test*

Development intervals according to standardized scores	Lot D		Lot N	
Semantic knowledge (vocabulary)	No. of subjects	Percentage	No. of subjecs	Percentage
Superior semantic development (over 14)	-	-	39	55,7
Semantic development over average (13-14)	9	11,2	15	21,4
Semantic development at aan average level (8-12)	66	82,5	16	22,9
Dezvoltare semantică sub medie (6-7)	5	6,3	-	-
Total no. of subjects	80	100%	70	100%
Morpho-syntactic Rules				
Morpho-syntactic superior development (over 14)	2	2,5	43	61,4
Morpho-syntactic over average development (13-14)	6	7,5	11	15,7
Average level morpho-syntactic development (8-12)	66	82,5	16	22,9
Under average morpho-syntactic development (6-7)	6	7,5	-	-
Total no. of subjects	80	100%	70	100%

Table 2, regarding the classification of preschoolers' performances from the perspective of *Semantic Knowledge* shows that for TL preschoolers the performances are cantoned / established at the average level (82.5%) and in small proportions at an above average level (11.2%) or at a below average level (6.3%). For typical preschoolers, the polarization of the results is achieved at a higher level (55.7% of them), and the rest of the subjects have performances, almost in equal proportions, distributed at the average level (22.9%) and above average (21.4%).

From the perspective of mastering *the Morpho-syntactic Rules*, the distribution of results is similar to that of the first subtest, typical preschoolers registering mainly superior performances (61.4%), then performances at the average level (22.9%) and above average level (15, 7%). Most TL preschoolers had performances at the average level (82.5%), but also at below average (7.5%) or above average (7.5%). Very few of the latter (2.5%) had higher performance.

The sum of the standardized scores in the first two sections (or composite scores) allowed the calculation of the BLT-2 language development coefficients, by reference to the chronological age. The general situation of the classification of the subjects from both groups on language development levels was represented graphically below.

Overall, we find that the language performance of TL preschoolers was clearly placed at lower levels, respectively most of them had medium (62%) or below average (20%) performance, and few of them had better results, over average (11.2%) or higher (6.3%). On the other hand, it is observed that language development was predominantly higher level in typical preschoolers (70%), but also of intermediate level (15.7%) or above average (14.3%).

Table 3. Distribution of subjects from groups D and N by development levels a language skills, on the BLT-2 test

|	*Lot D*		*Lot N*	
Intervals for the development of language skills according to the BLT-2 coefficients	*No. of subjects*	*Percentage*	*No.of subjects*	*Percentage*
Higher language development (over 120)	5	6.3	49	70
Language Development Above Average (111-120)	9	11.2	10	14.3
Intermediate language development (90-110)	50	62.5	11	15.7
Language Development Below Average (80-89)	16	20	-	-
Total no. ofsubjects	80	100%	70	100%
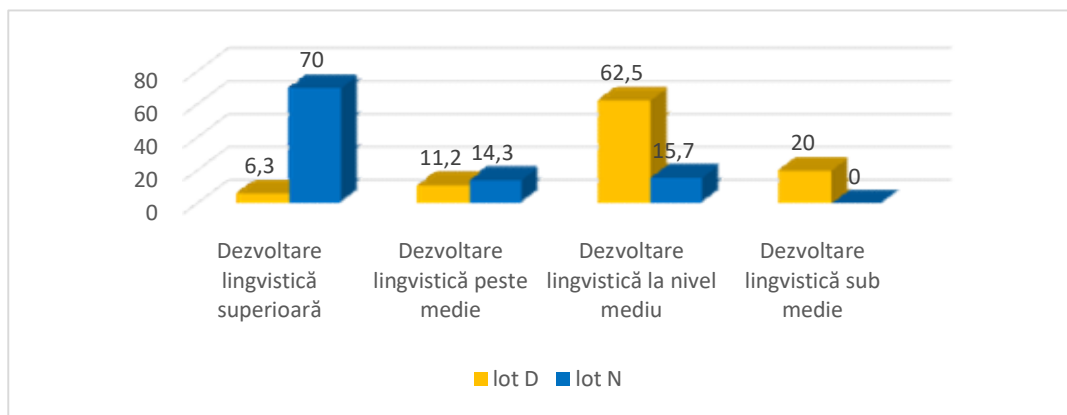
Figure 2. Distribution of subjects from groups D and N by language development levels, at the *BLT-2 test*

We conclude that the presence of polymorphic dyslalia, imparts an inferior development of linguistic structures in high school students, from a semantic, morphological, syntactic, pragmatic point of view. Although many preschoolers have an average language performance, the differences are significant in language development if we refer to the situation of preschoolers with typical mental development. The statistical analysis of the data obtained at the BLT-2 test allowed the validation of the working hypothesis at this level, being valid the statement that there are significant differences between preschoolers with pronunciation disorders and typical preschoolers in terms of language development on the semantic, morphological side, syntactic, pragmatic.

Regarding the means of intervention, they must be identified and customized, so that the expected results appear and can be perpetuated, facilitating the proper development and integration into society. A systemic program of psycho-speech therapy intervention was elaborated, directed on three dimensions, each one in turn comprising areas of influence. We insisted on methods, exercises, games, psycho-speech therapy techniques for educating and developing language structures in older preschool children with language disorders. We selected two homogeneous groups of preschoolers with language disorders, GE and GC. The homogeneity of the groups of preschoolers selected for the training experiment was confirmed from a statistical point of view, by applying the *U test, Mann Whitney.*

3.2. The results obtained after the speech therapy intervention

The comparison of the results of the experimental group and the control group (GE / GC), from the test and retest stage (initial / final) was made by calculating the averages (to delimit the central trend of the data) and by applying the Wilcoxon statistical test, and comparing the results at the retest stage between the two groups was performed using the U-Mann Whitney statistical test.

The hypothesis of the formative experiment advanced the presumption that between the results of the experimental group and those of the control group there will be statistically significant differences in all aspects subject to intervention: the remedy of pronunciation disorders; language development and oral communication; development of memory function. Table 4 and Figure 3 shows the progress between GE and GC preschoolers.

Table 4. Mean values of results and Wilcoxon test, GE / GC test-retest, at Bankson-2 Language Assessment Test (BLT-2)

	GE				*GC*			
	Test M1	Retest M2	Z	*P*	Test M1	Retest M2	Z	*P*
Semantic knowledge	26.91	33.16	-3.169	.002	27.33	27.66	-2.000	.046
Morpho-semantic Rules	41.58	46.33	-3.089	.002	41.66	41.91	-1.732	.083
Pragmatic language	4.41	4.66	-1.732	.083	4.16	4.33	-1.414	.157

The *Wilcoxon test* revealed statistically significant progress only in GE subjects: in *Semantic knowledge* M1 = 26.91; M2 = 33.16; Z = -3.169; p = 0.002; at *Morpho-syntactic Rules* M1 = 41.58; M2 = 46.33; Z = -3.086; p = 0.002; in GC subjects the progress was insignificant: in Semantic Knowledge M1 = 27.33; M2 = 27.66; Z = -2,000; p = 0.046; at Morpho-syntactic Rules M1 = 41.66; M2 = 41.91; Z = -1.732; p = 0.083.
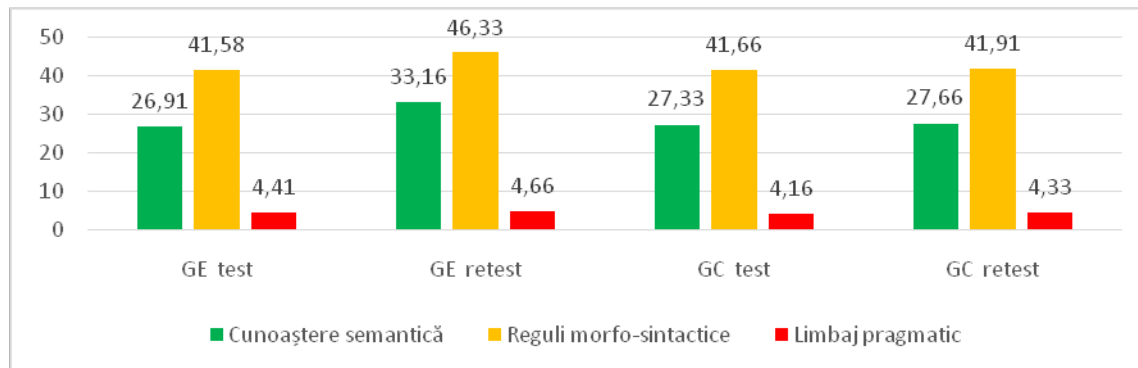

Figure 3. Average BLT-2 test performance values, GE / GC, test / retest

At the level of *pragmatic language* there were no significant differences in both groups, for preschoolers GE M1 = 4.41; M2 = 4.66; Z = -1.732; p = 0.083, and for preschoolers GC M1 = 4.16; M2 = 4.33; Z = -1.414; p = 0.157.

At the testing stage, the homogeneity of the GE and GC groups was verified, and the results of the *BLT-2 test* were statistically insignificant, at significance thresholds in the value

range p = 0.568 - 0.750; at the retest stage the application of the U-Mann Whitney test indicated significant differences between GE and GC, only at *Semantic Knowledge* (U = 35,000; p = 0.032) and *Morpho-syntactic Rules* (U = 29,500; p = 0.014); at the level of *pragmatic language* the differences were not significant (U = 57,000; p = 0.371).

The results of the *BLT-2 test* partially confirm the working hypothesis, the differences being statistically significant between GE and GC, at the level of the semantic and morpho-syntactic sides of the language. Pragmatic language requires more activities, carried out in microgroups of children, a longer period of intervention, especially when it comes to children with language disorders.

Conclusions

Pronunciation disorders are the most common form of language disorders in preschool age, their frequency decreasing with age, a fact related to the maturation of the phono-articulatory system, brain systems, but also to a systemic speech therapy program, with removal of triggering causes. Psychologically, dyslalic disorder is experienced by the child as an inability to express himself/ herself correctly, which, if not treated appropriately, can predispose to significant disruptions in the regulatory and communicative function of language. Language disorder (polymorphic dyslalia) in preschoolers affects all components of language, exerts a dragging influence on language structures, creates impediments to development, impedes the proper organization of mental life.

Through our investigation, through the statistical processing of experimental data, we found that in preschoolers with polymorphic dyslalia, language development predominates at medium level, and in preschoolers with typical development, we recorded the higher level of language development. When retesting preschoolers after the psycho-speech therapy intervention, the results reveal statistically significant differences between the two groups of subjects at the semantic and morpho-syntactic levels of the language; likewise, the performance of the preschoolers from the experimental group consisted in a better capacity of phonological processing, of understanding some verbal instructions of increasing complexity or of quick naming of some familiar words.

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