

THE RELATION BETWEEN THE DEVELOPMENTAL STAGE OF EXPRESSIVE AND RECEPTIVE LANGUAGE AMONG CHILDREN WITH PDD-NOS

CLAUDIA CRIȘAN*

ABSTRACT. The present study, carried over a period of four years, investigated the existing relation between the developmental stage of receptive and expressive language in the case of two children with PDD-NOS (Pervasive Developmental Disorder - Not Otherwise Specified). The participants benefited from the intervention based on language and communication stimulation method applied in the case of children with Autism Spectrum Disorder (LCSMA - Language and Communication Stimulation Method in Autism; Dascăl Crișan, 2012). According to the results obtained, significant differences were noted between the receptive and expressive language developmental stage, however there were no differences recorded regarding the receptive developmental stage and mental age.

Key words: *autism, expressive language, receptive language, LCSMA.*

ABSTRAKT. Diese Studie, die über einen Zeitraum von vier Jahren durchgeführt wurde, hat die Beziehung zwischen der Höhe der Entwicklung der rezeptiven und expressiven Sprache untersucht, wenn 2 Kinder an PDD-NOS leiden. Die Teilnehmer erhielten die Intervention auf der Grundlage der Verfahren zur Stimulierung Sprache und Kommunikation für Kinder mit Autismus-Spektrum-Störungen (MSLCA; Dascal Crisan, 2012), und durch die Ergebnisse, zeigten sich signifikante Unterschiede zwischen der Entwicklung der expressiven und rezeptiven Sprache, aber keine signifikanten Unterschiede zwischen der Höhe der Entwicklung der rezeptiven Sprache und geistige Alter bemerkt.

Stichwort: *autismus, rezeptiven Sprache, expressiven Sprache, LCSMA.*

* Senior Lecturer, PhD, Babes Bolyai University, Cluj-Napoca, Department of Educational Sciences, Romania, claudia.crisan@ubbcluj.ro

Introduction

Even though there is a general agreement upon the fact that one of the main characteristics of Autism Spectrum Disorders involves language impairments, the nature of these features are far from being understood. Although the deficiencies in language comprehension (both verbal and nonverbal) does not constitute a diagnosing criteria for ASD, there is evidence pointing in this direction (however more limited than in the case of expressive language). Therefore the studies carried by Bartak, Rutter & Cox (1975; 1977) represented a reference point towards this direction for many scientific circles. In a comparative study, the authors assessed both the expressive and comprehension language skills in the case of two groups of participants, respectively autistic versus individuals with severe receptive language impairment. According to the results obtained, the authors emphasized the existence of a significant impairment of autistic participants, compared to the other group, regardless of the same nonverbal IQ. Moreover, it was noted that language comprehension skills were more deficient compared to verbal expressive language. In a further study, Paul & Cohen (1984) noted that this group had a much lower performance at the standardized tests measuring language comprehension, compared to the aphasic or mentally retarded individuals, with a similar nonverbal IQ. However, other studies (Jarrold, Boucher & Russel, 1997) presented evidence regarding the lack of a significant difference between verbal utterance and comprehension by comparing autistic children with individuals diagnosed with Asperger Syndrome or severe language impairments. as a response to this research, Kjelgaard & Tager-Flusberg (2001) initiated a large study that investigated various verb features (phonological utterance and vocabulary, language comprehension, semantic and grammar features) in the case of 89 autistic children. At the end of the study results showed a significant heterogeneity in the obtained performance, with a part of the participants having appropriate mental age performance whereas the others having a below mental age performance. Chan & colleagues (2005) support these conclusions with the results obtained in their study. According to the results, they identified three different situations, respectively it was noted that 21% of the participants showed appropriate aged performance, yet with significant verbal skills impairments, 42% presented themselves with deficiencies both regarding expressive and receptive language and 37% had a close to normal performance. These results highlight the existence of a developmental continuum that children with autism follow, so that we can find people with major impairments regarding expressive language and language comprehension, while others no not present such deficiencies. Moreover, the authors noted that these difficulties are not entirely influenced by the general developmental level (intelligence quotient), given that the participants of the study were both high functioning or low functioning (Chan & colab., 2005).

Description of the method

Launched in 2007 under the name of “The intervention technique for stimulating the communication in autism” (Dascăl Crișan, 2007), the method was subjected to various content changes, being currently known as LCSMA, respectively the Language and Communication Stimulation Method in Autism (Dascăl Crișan, 2012). The method can be defined as the result of a coherent combination of several intervention procedures and strategies dispersed across various research studies, complemented with new elements where gaps were found. Therefore the elaborated method is based on the Receptive Language Stimulation Method (Bricher & Bricher, 1972), PECS (Bondy & Frost, 1983), VIA (Siegel, 2003) and a series of ABA techniques. Moreover, the devised method incorporated strategies for stimulating the communication skills of preverbal children recommended by Schuler, Prizant & Wetherby (1997) or strategies for stimulating the communication skills of children in the more advanced stages of language acquisition developed by Prizant, Schuler, Wetherby & Rydell in 1997. Thus an attempt was made to elaborate a comprehensive approach can be applied for all ASD children, despite of their communication and language acquisition stage development, of their learning pace, their developmental stage or their current and future needs.

The method is addressed to those individuals who display a lack of interest towards speech significance or are unable to utilize speech in a functional manner. Based on the principle of gradually increasing the complexity of tasks and implicitly of communication behaviors, LCSMA is built upon three main progressive levels, each of them consisting of a series of behavioral sequences based on the Chaining technique (Tabel 1-1).

Table 1-1.

Phases and steps of LCSMA (Dascăl Crișan, 2012, Crișan 2014)

Phases	Description of the phases
<p>Phase 1: Acquisition of early intentional communication and receptive language behaviors.</p>	<p><i>1.1. Early intentional and anticipatory behaviors.</i> <i>1.2. Replacing the ideosyncratic (unconventional) communication and problem behaviors with conventional communication behaviors.</i> <i>1.3. Receptive language stimulation.</i> <i>1.4. Teaching verbal labels for common objects and practicing simple actions with those objects.</i> <i>1.5. Objects differentiation.</i> <i>1.6. Complex verbal instructions.</i></p>

Phases	Description of the phases
Phase 2: Communication using 3-D objects	<i>2.1. Communication by the use of symbols of natural shape and size.</i> <i>2.2. Discrimination among symbols.</i> <i>2.3. Expanding the communication area.</i> <i>2.4. Transition from communication using natural size symbols to communication using miniature symbols.</i> <i>2.5. Associating the miniature object with the right picture.</i>
Phase 3: Communication using pictures	<i>3.1. Vocabulary expansion and formulating simple sentences.</i> <i>3.2. Formulating complex sentences.</i> <i>3.3. Initiation and maintaining simple conversations.</i> <i>3.4. Making spontaneous comments and descriptions.</i> <i>3.5. Acquisition of conversational skills and strategies.</i>

The method proved itself to be efficient for developing the communication skills in the case of 6 children with autism and other PDD (Dascăl Crișan, 2012), for acquiring protoimperative and protodeclarative communication skills (Crișan, 2013a), and for decreasing problem behaviors derived from acquiring communication skills (Crișan, 2013b; Crișan & Stan, 2013).

Research Questions

Q1. Are there significant differences between the expressive and receptive language developmental stage if the child benefits from treatment based on the language stimulation method using augmentative and alternative communication means such as LCSMA?:

Variable 1 (V1) Expressive language developmental stage (EL) includes both verbal language and augmentative and alternative communication means;

Variable 2 (V2) Receptive language developmental stage.

Q2. Are there significant differences between language developmental stage (expressive and receptive) and mental age in the evolution of the participants in the study?

Variable 1 (V1) Expressive language developmental stage (EL) includes both verbal language and augmentative and alternative communication means;

Variable 2 (V2) Receptive language developmental stage;

Variable 3 (V3) Mental age (MA).

Method

Participants

The present study included 2 preschoolers diagnosed with PDD-NOS (2 boys), aged 3 years and 8 months, respectively 3 years and 6 months. During the intervention the children benefited from therapy based on LCSMA within a special school for disabled, their inclusion in the research being done in accordance with the participation agreement signed by their family or legal caregiver.

Assessment instruments

The assessment instruments used in the present study: the whole 5 sub scales of Portage Development Scale for assessing the general developmental stage respectively mental age and more specifically the language section for assessing the development of expressive language (including AAC means) and Peabody Picture Vocabulary Test-Revised (PPVT-R) for the assessment of receptive language development.

Peabody Picture Vocabulary Test-Revised (Dunn & Dunn, 1959; 1980) is a standardized test addressed to nonverbal individuals aged between 2,6-40 years old. The instrument is used to assess the receptive developmental stage, by indicating the verbal label of the item demanded by the assessed person on an assessment worksheet with four pictures among which only represents the correct word. The test includes 684 input-words, decided into two series, L form and M form, each containing 175 worksheets distributed across three levels (180 for preschool level, from 2,6 to 5 years old; 204 for intermediary level for children aged 5 to 10 years old; and 300 for advanced level, children above 10 years old and adults). The distribution of input-words across the two series is well balanced regarding the inclusion of verbs, nouns and adjectives and does not neglect the difficulty level, once you advance in using the instrument. The two types of statistical operations used to determine the internal consistency of the scale were the reliability correlation coefficient (rtt) and standard error of measurement (SEM). According to the results obtained for each age group, the internal consistency coefficient in the case of children and young individuals is between .67 and .88 for L form (mean .80) and between .61 and .88 for M form (mean .81).

Portage Development Scale is an assessment instrument used in the case of children aged 0-6 years old, designed with the purpose of determining the intelligence coefficient, respectively mental age and the developmental stage across 5 developmental areas (motor, communication, social, cognitive and personal autonomy). The assessment consists of a checklist including behaviors and skills that is supposed to be completed by the child's caregivers, thus resulting in a thorough performance assessment across the 5 developmental

areas. The 526 items of the scale are structured according to the age levels of normally developed children. Regarding internal consistency, results indicated the following: social .80, communication .81, personal autonomy .73, cognitive .70, motor .75, and .80 for the whole scale.

Research design, intervention procedure

The present intervention-research was based on the single subject experimental design ABAB, carried out through 3 longitudinal case studies over a period of 4 years. According to the methodology imposed by the current research approach, the design of the study has the following structure:

The first phase consists in assessing the level of expressive and receptive language of the participants in the current study with the purpose of collecting the information and data for establishing the baseline level. Thus the children were assessed using the PPVT-R and Portage Development Scale. The second phase of the study followed, consisting of the experiment. Within this stage the study involved the implementation of AAC intervention programs based on LCSMA and monitoring the obtained results through regular evaluations every year throughout the four years, in order to determine the expressive and receptive developmental stage (expressive language includes the augmentative and alternative communication means). The third phase of the study consists of the final assessment aimed at determining both the existing differences between the two language components from initial and final stage of the experiment and the efficiency of the method used and it included analyzing the results obtained from the participants in the study over the 4 years of intervention.

Data analysis and interpretation

The results obtained by the two participants in the study according to the purpose and the research questions (Table 1.2.) show a significant difference between expressive and receptive language at the beginning of the study that gradually decreases in the case of the two children diagnosed with DPP-NOS.

Table 1.2.

Results obtained by the two participants in the study across months.

Assessment	Participants							
	N1				N2			
	CA	MA	EL	RL	CA	MA	EL	RL
Initial Assessment	46	28	9	23	42	12	2	-

INITIAL TEACHERS TRAINING PROGRAM TRAINERS' OPINIONS

Progress Assessment 1	58	40	24	38	52	20	18	25
Progress Assessment 2	70	50	31	40	66	37	31	34
Progress Assessment 3	82	58	44	54	78	52	42	49
Final Assessment	94	63	60	66	90	57	48	55

The analysis of the reference data for participant N1 (Figure 1) show significant delays of approximately 18 months between the developmental stage according to the biological age (46 months) and mental age (28 months), which is also similar (5 months delay) to the receptive language developmental stage (23 months). Moreover, there were significant differences noted between the expressive language developmental stage (9 months) and the receptive language developmental stage (23 months), resulting in a 14 months delay regarding these two language components. The results indicate that N1 has a higher level of language comprehension skills compared to the level of communicating what he already knows or wants to communicate, a fact that is a consequence of lacking functional communication skills.

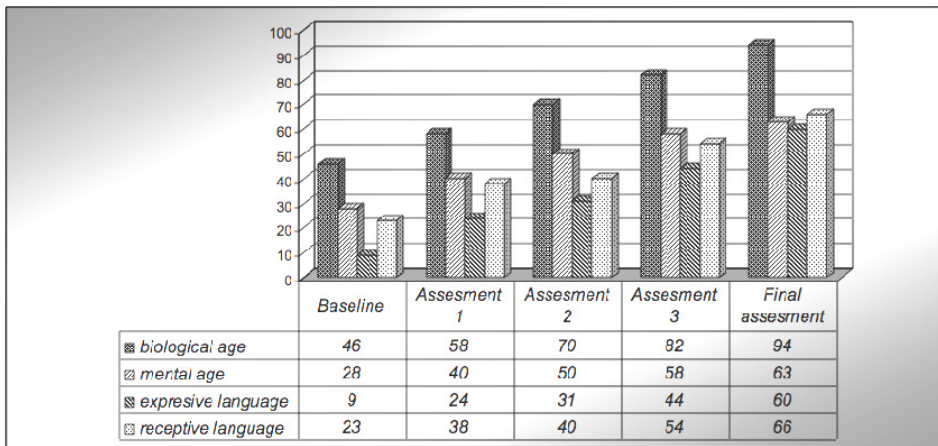


Figure 1. Progress of participant N1

According to the results obtained, N1 benefited from an individualized intervention based on LCSMA, over a period of 4 years. During this time, the obtained results show a progress regarding the child's language acquisition (expressive and receptive language). Therefore after one year of intervention during which the child was taught to use augmentative and alternative communication means (AAC) across various environments, the delay between

expressive language developmental stage (including the communication through AAC) and the receptive language developmental stage decreased from 23 months (during initial assessment) to 14 months during the first progress assessment.

The progress maintained during the following years, with the delays between the two language components gradually decreasing. Therefore during the second progress assessment the developmental delay between EL and RL is 9 months, during the third progress assessment the delay is 10 months and during the final assessment the existing delay is only 6 months. Additionally, it can be noted that the receptive language development is very close to the child’s mental age, with minor differences (the delay between MA and RL during the second progress assessment is 10 months, during third progress assessment is 4 months and during final assessment is 3 months).

According to the obtained results the LCSMA proved to be efficient in the case of N1 regarding the acquisitions within language and communication areas (expressive and receptive), yet the evolution between the two components is different. The data shows significant differences between the expressive and receptive language development stages, with the latter recording a better improvement and closer to the child’s mental age. Moreover, the child showed a gradual progress, but lacking constancy, respectively the child went through both fast and slower paced acquisition periods. What we need to emphasize is that throughout the end of the study the child uses both verbal and AAC communication means, with the verbal language being the dominant one.

In the case of N2, the second participant to the study, the results obtained (Figure 2) show a much slower progress compared to the first participant.

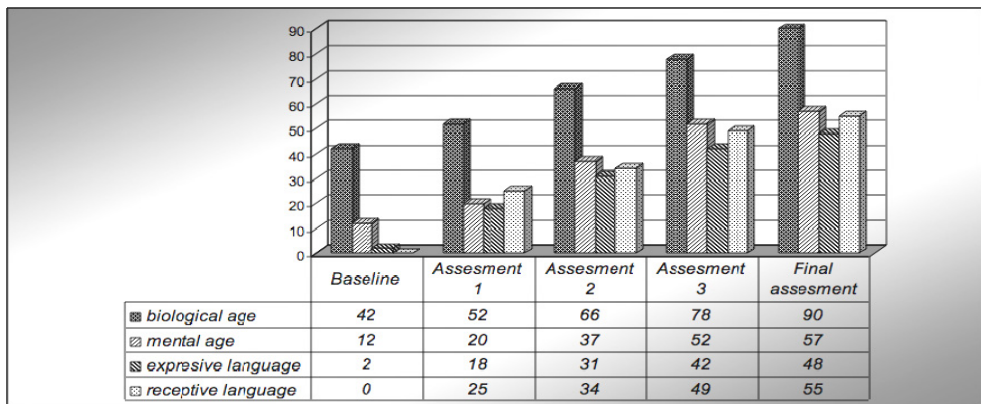


Figure 2. Progress of participant N2

According to the baseline assessment, significant delays were recorded, of 30 months, between biological age (42 months) and mental age (12 months). As a consequence of the low mental age, N2 could not be tested using PPTV-R during this stage, due to the fact that his capacity of associating an image with the verbal label was not yet developed. Thus the score obtained by N2 regarding receptive language developmental stage was 0. According to the results obtained on Portage Development Scale, the child showed a very low expressive language stage, of approximately 2 months.

Based on these results, the participant benefited from a 2 years LCSMA individualized intervention for communication and language stimulation. After the intervention the child showed a remarkable improvement once he was taught how to use AAC across various environments. This after one year of intervention, the performance of N2 regarding the receptive and expressive language (including AAC) corresponded to that of an 18 months old child, and regarding receptive language, the comprehension level corresponded to that of a 25 month old child. Even though there is a delay between the two language components (expressive and receptive) of approximately 7 months, the results obtained are noteworthy, given that LCSMA proved its efficiency in this case.

During the following three years of intervention, the progress assessments showed a positive evolution in language development, yet with existing delays between expressive and receptive language. Therefore after the second year of intervention there was an approximately 3 months delay between EL (31 months) and RL (34 months), during the third progress assessment the delay remains constant and during the final assessment there was a 7 months delay between EL (48 months) and receptive language (55 months).

Additionally, analyzing the obtained results, it can be noted that the receptive language developmental stage of the child is very close to his mental age, yet lower than the appropriate level for his biological age.

Discussions and conclusions

According to the results obtained by the two participants in the study, the scores show significant differences between the expressive language developmental stage and the receptive language developmental stage, with a delay varying across the research period from a difference of 10 months to a much lower one of approximately 3 months towards the end of the study. These results indicate that in the case of the children with PDD-NOS included in the study, the language comprehension stage is much higher than their capacity of using verbal language or other AAC means to express what they know or what they want to convey to others.

Another important aspect to be noted is the efficiency of LCSMA in the treatment of nonverbal children with PDD-NOS. Therefore, once the individualized treatment for language and communication stimulation was introduced, a remarkable improvement was recorded, the most notable being in the case of N2 during the first year of intervention. The children were taught to use AAC means and subsequently verbal ones in a functional manner through specific methods, strategies and techniques, in various social contexts, which led to positive effects both regarding language development and new acquisitions within other developmental areas assessed with Portage Development Scale. Within the present study, the mental age established with Portage Scale shows an approximately close level to the receptive language stage, even though it is lower than the biological age of the participants.

Additionally, the results indicate variations within the evolution of the participants, having recorded both fast paced and slower paced periods regarding the rhythm of the acquisitions noted. This fact was shown both regarding the expressive and receptive language development.

In conclusion, there were significant differences recorded in the case of the two children with PDD-NOS under study, regarding the expressive and the receptive developmental stage, the latter recording a higher level. Moreover, even though the two participants had a similar age, the rhythm of their acquisitions was different, which indicates the existence of potential discrepancies between children with PDD-NOS resulting in the need to adapt the intervention according to the child's potential, developmental level, learning rhythm and knowledge transfer from one context to another.

REFERENCES

- Bartak, L., Rutter, M., Cox, A. (1975). A comparative study of infantile autism and specific developmental receptive language disorder: I. The children. *The British Journal of Psychiatry*, 126, 127–145.
- Bartak, L., Rutter, M., Cox, A. (1977). A comparative study of infantile autism and specific developmental receptive language disorder: II. Discriminant function analysis. In *Journal of Autism and Childhood Schizophrenia*, 7, 383–396.
- Bondy A., & Frost L., (1994). Picture Exchange Communication System. In *Focus on Autism Behavior*, 9, 1-19.
- Bondy, A., & Frost, L. (2009). The Picture Exchange Communication System: Clinical and Research application. In P. Mirenda, T. Iacono, (Eds), *Autism Spectrum Disorders and AAC*, pp. 279-302. Baltimore: Paul H. Brookes Publishing Co.

- Bricher W, & Brocker D., (1972). A systematic approach to language training. In R. L. Schiefelbusch (Ed.), *Language of the mentally retarded*, pp. 75-92. Baltimore: University Park Press.
- Chan A.S, Cheung J, Leung W.M, Cheung R., Cheung M. (2005). Verbal Expression and Comprehension Deficits in young children with autism. In *Focus of Autism and Other Developmental Disabilities*, vol. 20, nr. 2., pp. 117-209.
- Crișan C. (2013a). Introducing a new method of developing the functional communication in children with autism: Language and Communication Stimulation Method in Autism (LCSMA) Paper presented at the international conference: *Education, Reflection, Development*, UBB, Cluj-Napoca Romania.
- Crișan C. (2013b). The relation between the developmental level of communication skills and display of challenging behaviors in children with ASD, in „*Studia*”
- Crisan, C. (2014). *Autistic spectrum disorders. Diagnosis, assessment, therapy*. Cluj- Napoca: Editura Eikon.
- Crișan C., Stan C., (2013).The efficiency of LCSMA in reducing challenging behaviors in children with autism. In *Journal of Cognitive and Behavioral Psychotherapies*, Vol. 13, No. 2, pp. 421-435.
- Dascăl Crișan C. (2007). Tehnica de intervenție pentru stimularea comunicării în autism. În Bocoș M, Chiș V., Albulescu I., Stan C. (Coord.) „*Tradiții, valori și perspective în științele educației*”, Ed. Casa cărții de Știință, pp. 186-18.
- Dascăl Crisan, C. (2012). *Augmentative and alternative communication methods for children with autism spectrum disorders*. Unpublished doctoral dissertation. UBB, Cluj-Napoca.
- Dunn L.M., Dunn L.M., (1981). *Peabody Picture Vocabulary Test-Revised: Manual for forms L and M*. Circle Pines, MN: American Guidance Service.
- Jarrold, C., Boucher, J., Russell, J. (1997). Language profiles in children with autism: Theoretical and methodological implications. *Autism*, 1, 57-76.
- Kjelgaard, M.M., Tager-Flusberg, H. (2001). An investigation of language impairment in autism: Implications for genetic subgroups. *Language and Cognitive Processes*, 16, pp. 287-308.
- Paul R., Cohen D.J, (1984a). Outcomes of severe disorders of language acquisition. în *Journal of Autism and Developmental Disorders*, nr. 14, pp. 405-422.
- Prizant B.M., Schuler A.L., Wetherby A.M., Rydell P. (1997). Enhancing language and communication development: Language approaches. In D. J. Cohen, & F. R.
- Schuler A.L., Prizant B.M., Wetherby A.M., (1997). Enhancing language and communication development: Prelinguistic approaches. In Cohen D.J., Volkmar F.R. (Eds) *Handbook of Autism and Pervasive developmental disorders*. pp. 539-571. John Wiley & Sons, INC.
- Siegel, B. (2003). *Helping children with autism learn: A guide to treatment approaches for parents and professionals*. New York: Oxford University Press.
- Siegel B., (2004). VIA. Visual Interaction Augmentation. in *Autism News of Orange County & and the Rest of the World*, 3, 7-11.

