

Investigating The Association Between Visual Perception Disorders And Difficulties In First Reading And Writing

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Abstract – Visual Perception is an important cognitive function or activity, through which the informational visual stimuli of the environment received by the sensory organs, are recognized as objects or events. The most important developmental period for the development of cognitive function of typical developed children is from 3.5 to 7.5 years, ie during their attendance in kindergarten and at the first grades of Primary School. This research, investigate the connection of Visual Perception Disorders with the appearance of possible difficulties in the first Reading and writing attempts.

The tools of the research were the Detective Criterion of Visual Perception (AKOA 5-6) (KOUTRAS 2012) and the First Reading and Writing Test (VAMVOUKAS 2009). Moreover, the sample of the research were 300 preschool students. The analysis of the results recorded a statistically significant correlation between reading and visual and copying skills. As far as writing is concerned, it is statistically significant in relation to visual memory, visual discrimination of letter shapes and visual enclosure.

Keywords – Visual Perception, Early Detection, Learning Disabilities.

I. INTRODUCTION

Learning and acquiring knowledge is a phenomenon associated with the maintenance and evolution of life. The process of acquiring, retaining, and utilizing information is the phenomenon of learning and acquiring knowledge (Porpodas, 2009). The two systems of human communication are written and oral speech. In other words, the written word, that is, reading and writing, is built on the spoken word and as it is argued that the spoken word precedes the written word and in fact that reading is based on and depends on speech. What makes human being, is based on mans' ability to learn to read and write (Vamvoukas 2009).

Many definitions of the concept of reading have been formulated, such as that reading is the "ability of the individual to understand the thoughts and feelings of others through a text (Pumfrey, 1991). Another definition is: " complex cognitive function that requires visual, motor, and auditory skills, so that the person can recognize the symbols and words, so as to combine them with the appropriate sounds and give them meanings derived from previous experiences.

Writing means "the representation of speech with the help of graphic, conventional, systematic, recognizable, sequential and linear points" or as it is otherwise defined, writing is a coded system of visible-perceptible points, which bind the words so fully, so that complex structures and references, can be accurately recorded in all their complexity. (Vamvoukas, 2009)

It has been documented that the processes of acquiring the ability to write and read are related on the one hand to the quality of visual and auditory perception, and on the other hand to the environmental, cultural, social and emotional context (Grisseman , 1995).

Perception is categorized to the processes of recognizing and interpreting information received through the sense of Sight. The terms "perception" and "visual processing" are often used interchangeably. Although there are many types of perception, the two

most common areas associated with a learning disability are visual and auditory perception. With so much information in the classroom and at home presented visually or orally, a child with visual or auditory impairment may face issues and have disadvantages as far as the learning procedure is concerned (Kurtz , 2006).

Perceptual disorder refers to an impaired ability received through eyes. This type differs from vision problems or visual acuity. Visual processing difficulties affect how the brain interprets or processes visual information (Cirerchia 2017)

Learning Disabilities and Visual Perception

The term "Learning Disabilities" was coined in 1962 by Samuel Kirk who used it to describe children who, despite their average or above average intelligence, seemed to face problems at school (Coleman , Buysse & Neitzel .2006 a) .

Given that children with Learning Disabilities have become the largest group of students in need of special education programs, current estimates show that 3.4% of school-age children receiving special education are categorized as children with special learning needs. (U. S _ Depantment of education , .2011). It is important to identify young children who may appear early signs of learning disabilities, so as to support them and address their problems (Neitzel , 2011, Coleman , Roth & West 2009)

The National Joint Council on Learning Disabilities (joint council on learning Disabilities, 2006) argues that "the purpose of early recognition is to identify children with developmental problems that may impede learning or put the child at risk" (S. kirk , J Gallaher , M. _ Coleman , 2021)

It is important to emphasize on students with Learning Disabilities, even those who do not experiencing problems with vision and touch and who seem to differ from their typical peers as far as visual and auditory perception and processing, is concerned. These difficulties mainly affect the school performance in kindergarten and in the first school age and especially the process of the first reading (Lerner , Jones , 2012).

The main areas of visual perception in which problems occur are: the perception of space relations, visual discrimination, visual memory and visual sequence.

Students with problems in perceiving relationships in space, find it difficult to perceive objects in space, to distinguish meanings as right and left, or distance and speed (suchof IB , 1981). They are clumsy in their movements, and they find it difficult to move between objects. Moreover, they often lose things and find it difficult to orient themselves on paper. Also, in larger classes they may show weaknesses in the interpretation of maps, diagrams and tables.

The problems of visual discrimination focuses on the discrimination of objects based on some of their characteristics. Students with visual impairment have weaknesses in distinguishing shapes, characters or details. Even these difficulties can explain the mirror writing as well as the delay of these children to learn to copy shapes and characters, which leads to an older age of poor graphic character and messy writing with erasures, unequallities or no spaces between words or letters (Willows & Terepocki , 1993). These students can not recognize a symbol or object from a place, as a result of which they find it difficult to understand mainly higher level mathematical concepts (Bley & Thorton , 1995).

Students with visual memory problems have difficulty storing and retrieving information received visually. These difficulties are related to both the accuracy and speed of memory of visual stimuli and are more pronounced in students in the lower grades of elementary school than in students in larger grades (Willows , Corcos & Kershner , 1993).

It is obvious that the difficulty these students face in distinguishing visual elements of shapes, sequences of objects, letters and numbers plays an important and negative role in their school life and learning. Students with visual sequence problems have difficulties in perceiving sequences of objects, symbols or events, that are presented or represented visually. So they can not select a piece that is missing from a series of symbols, swap letters within words and numeric digits into multi-digit numbers (Bley & Thorton , 1995).

Learning Disabilities in reading and writing

Students with learning disabilities face issues which significantly vary as far as the cognitive objectives are concerned or the educational level of each student. However, these issues are mainly concern the handling of the written word (reading and writing) and in many cases handling of mathematical concepts.

Learning difficulties in reading

The main problem faced by students with learning difficulties in writing processing is the difficulty in reading (Siegel , 2003) which is confirmed by the large number of students with learning difficulties who have problems in decoding and comprehension of written texts (Joseph , 2002 , Williams & Baker , 2001).

A basic condition for the accurate detection of reading difficulties is the description of the problems of students with learning difficulties in reading. These problems are found in decoding, and then in understanding (Archer , Clemson & Vachon , 2003).

Reading decoding is the process of recognizing and manipulating the alphabetic code. The difficulties mentioned in reading decoding are related to the core of learning difficulties.

In kindergarten and early school age, there are many difficulties in handling oral speech (Bachman , 1997). In fact, there is a significant deficit of phonological processing that often makes it difficult for children with learning difficulties to master the alphabetic principle and consolidate decoding (Porpodas , 1992).

In the other grades of elementary school, the ability to decode is usually poor, affecting the ease of reading and therefore the extraction of meaning of the text, overloading their already limited memory. This results in generalized reading difficulty and a lack of good reading comprehension.

It has been reported that students with learning difficulties, having difficulty decoding quickly and accurately, block important cognitive resources and overload their already limited memory. This results in generalized reading difficulty and a lack of good reading comprehension. It has been reported that students with Learning accurately decode about one third of the words decoded by their typical peers (smith 2004,) although in Greek this percentage is reduced (porpodas , 1999) due to the high grammatical consistency of the language. However, difficulties also arise in secondary education. Students with Learning Disabilities handle long texts, difficult to understand and often with many scientific terms.

The manipulation of these texts is not successful, since the limited possibilities of expression of students with Learning Disabilities do not assist them to cope with the reading and comprehension of polysyllabic and difficult words that refer to complex and also difficult concepts (perfetti , 1986).

The difficulty of adolescents with Learning Disabilities to cope with such academic issues, is significant as a result of widening the academic knowledge deficits that have already accumulated since the school years of elementary school.

Ease of reading is an equally important feature of the reading process, as it contributes to reading comprehension and is the first indication of the existence of reading difficulties (speech & Ritchey 2005). Ability is defined as the ability to read words accurately, expressively and prosody (Archer & all , 2003) but also the ability to read a text automatically, quickly and smoothly, effortlessly and with a low focus on decoding (M eyer & Felton , 1999).

Students with Learning Disabilities have difficulty in completing these procedures. They read with difficulty and slowly, often stopping to pronounce a word spelling or letter-by-letter and often repeating parts of the text to understand them (Archer & all ., 2003)

In the last two decades, the majority of students with Learning Disabilities in reading in all languages and ages, face significant difficulties in the speed of word expression (Siegel , 2003)

Reading comprehension is a skill with a central role in human life, which is why it has an important place in all educational programs.

During the readers tries to structure a mental representation of the text by combining what they know with the ideas presented by the author. (Randi , Grigorenko & Sternberg , 2005).

Students with Learning Disabilities face significant problems in all of the above skills, resulting in a lack of understanding. These difficulties are found in basic skills where students with Learning Disabilities face limitations, such as those of concentration and memory (Bender , 2004). Fluency have a significant contribution in the inability of these children to understand the text in front of them, while limited vocabulary, poor and disorganized background knowledge, and lack of syntactic knowledge are of paramount importance (Smith , 2004).

Learning Disabilities in Writing

Students with Learning Disabilities often show problems in the production of written speech, in the form of weakness in writing or written expression despite their age and mental potential (Panteliadou, 2000)

These problems concern both complex skills, such as spelling, syntax and the organization of written speech, as well as the psychomotor skill of writing (Spantidakis, 2004)

Students with Learning Disabilities differ from their standard classmates in spelling, punctuation, and lowercase (H eyihg , 2004).

Handwriting is also problematic, slow and illegible (M miller - shall , 2005). The Difficulties of Children with Learning Disabilities in writing appear in all phases of writing, ie in the planning, recording, reviewing and editing of a text (Troia 2006)

At the same time, students are unable to express their ideas in writing on a topic and they use non-functional writing elements in their text, emphasizing the difficulty they face in the recording phase (Quinlon , 2004)

This weakness focuses both on the ability to relate ideas to the text, that is, on the transformation of ideas into linguistic representations, and on the recording, in which these representations acquire a written form (Berninger & Swanson , 1994)

Their texts often contain junk information or non-functional material, as they are unable to retain information on the subject of development. Also, their previous knowledge on the subject is limited and they are non-familiar with the structure of the texts.

The assessment of the correctness of the content of the text and the review for any errors is for the students with M.D. an equally demanding process as they find it difficult to identify the wrong combinations between the topic they intended to write and the end result (Troia , 2006)

II. RESEARCH PROCEDURE

Our research process focused on correlating the relevance of Visual Perception Disorders (Kurtz , 2006) with first reading and writing difficulties. The research sample consisted of 305 students of preschool and primary school age and two detection tools were used. The Detective Criterion of Visual Perception (A. K.O.A 5-6) (koutras 2012) and the First Reading and Writing Test (Vamvoukas 2009)

The Visual Perception Detection Criterion includes 8 subtests that examine the following areas of visual perception: Visual-motor coordination (3 tests), Visual Discernment (10 tests), Copy Shapes (10 tests), Perception of space (8 tests) Color Discernment (5 tests), Figure-letter distinction (5 tests) and Visual inclusion (5 tests)

The test for first reading and writing includes four sub -tests such as 1) picture recognition 2) word recognition 3) word writing 4) phrase writing. From the factor analysis of the test, two factors emerge, which measure the ability to read and write. When correlating the subscales of the two detection tools, it seems that there is a statistically significant positive correlation between the Visual Perception test with Word Writing, Phrase Writing, Reading and Writing and with the Reading and Writing Test as a whole. The statistically significant positive correlations found between Reading and the Visual Perception test are related to Pattern-letter Distinction and Pattern Copying, while the statistically significant positive correlations found between Scripture and the Visual Perception test are related to Memory. Shape-letter distinction, optical inclusion and pattern copying.

Therefore, the reading and writing test seems to be statistically significantly related to the A.K.O.A. test (5-6) and in particular to the following sub -tests: Visual Memory, Letter Form Distinction, Optical Enclosure and Copy Shapes.

III. CONCLUSIONS

The factors of visual perception are related to the learning process in many ways, although a specific disorder is not automatically related to a specific or all learning disabilities. School performance in writing, reading, spelling, mathematics depends on different visual abilities expressed in many ways. In conclusion, the specific effect of visual disturbances or dysfunctions on reading and writing depends on the nature of these problems, their severity, and the specific stage of reading development in which it is involved.

REFERENCES

- [1] Archer, AL, Gleason, MM & Vachon, VL (2003) Decoding and fluency: foundation skills for struggling older readers. *Learning disability quarterly*, 26, 89-101.
- [2] Bender, WN (1985). Differences between learning disabled and non-learning-disabled children in temperament and behavior. *Learning Disability Quarterly*, 11-18.
- [3] Bley, NS Thorton , CA (1995). *Teaching mathematics to the learning disabled* (3rd ed.) Austin, TX: Pro-ed.
- [4] Cirerchia M (2017), *visual Processing Disorders, Touch-type Read & spell*.
- [5] Coleman, MR Roth. F. West. T (2009). *Roadmap to pre-KRTI Applying response to intervention in preschool settings*. New York. NY. National Center for Learning Disabilities.
- [6] Heying K. _ (2014). *ODFCOVD Vision Processing & Therapy - Collaborative approaches with sensory processing disorders, ADHD , autism, dyslexia & traumatic brain injury*.
- [7] Joseph, LM (2002). Best Practices in planning interventions for students with reading Problems. *Best Practices in school psychology IV*, 803-816.
- [8] Kirk . S. , Gallacher J. , Coleman R. _ M. _ (Scientific Supervisor: Georgiadi Maria, Plexousakis Stefanos, Tombrou Dimitra-Maria) (2021) *Educating Children with Disabilities: Utopia*
- [9] Kurtz, AI (2006). *Visual Perception Problems in Children with AD / HD, Autism, and other Learning Disabilities*. London and Philadelphia: Jessica Kingsley Publishers.
- [10] Lerner, L., & Johns, B (2012). *Learning disabilities and related mild disabilities: Teaching strategies and new directions* (12th ed). Belmont, GA: Wadsworth Cengage learning.
- [11] Neitzel . J (2011) Current research on early intervening services for young children at risk for learning disabilities. *Perspectives on language and Literacy* 37 (3), 13-14.
- [12] Panteliadou .S (2011) *Learning Disabilities & Educational Practice. What and Why*. Athens .Publishing: Field
- [13] Porpodas , CD (1999). Patterns of phonological and memory Processing in beginning readers and spellers of Greek. *Journal of Learning Disabilities*, 32, 406-416.
- [14] Porpodas K. (1992 a). *The Reading*. Patra Self-publishing .
- [15] Spantidakis II (2004). *Problems with the production of written speech by school children*. Athens: Greek Letters
- [16] Siegel, LS (2003). Learning disabilities. In WM Reynolds & GE Miller (Eds.), *Handbook of psychology: Educational Psychology* (vol 7, pp. 455-486) Hoboken, NJ: John Wiley & sons, Inc.
- [17] Smith GR (2004). *Learning disabilities. The interaction of students and their environments* (5th ed.) Boston, MA: Allyn and Bacon - Pearson.
- [18] Speech, DL & Ritchey, KR (2005). A longitudinal study of the development of oral reading fluency in Youth children at risk for reading failure. *Journal of learning disabilities*, 38,5,387-399.
- [19] Suchoff , IB (1981). *The visual-spatial developments in the child*, New York: State University of New York.
- [20] Troia , GA (2006). *Writing instruction for students with learning disabilities*. In: GA MacArthur, S. Craham & J. Fitzgerald (Eds), *Handbook of writing research* (pp. 324-336) NY: The Guilford Press.
- [21] US Department of Education, office of special Education, office of special Education Programs, Data Analysis system (DANS) (2011). *Children with disabilities receiving special education under part B of the individuals with Disabilities Education Act*. Washington, DC: Author.
- [22] Vamvoukas . M. (2009). *Learning and Pedagogy of the first written words*. Athens: Publications Grigoris.

- [23] Vamvoukas . M. (2004). Psychopedagogical issues of reading. Athens: Publications Atrapos .
- [24] Willows, DM Corcos , E & Kershner , J. (1993). Perceptual and cognitive factors in disabled and normal readers' perception and memory of unfamiliar visual symbols. In S. Wright & R. Goner (Eds). Studies in visual information Processing: Facets of dyslexia and its remediation, (pp. 163-178), Amsterdam: Elsevier Science Publishers.
- [25] Willows, DM, & Terepocki , M. (1993). The relation of reversal errors to reading disability, In DM Willows, R. Kruk, & E. Corcos (Eds.), Visual Processes in Reading and Reading Disabilities pp. 31-56. Hillsdale, NJ: Lawrence Erlbaum.