

Study shows vision is not always the cause for learning disorders

14 March 2019

Learning difficulties in schoolchildren are not always associated with visual problems, since they may be neurobiological or derived from other alterations such as dyslexia or attention deficit hyperactivity disorder (ADHD). This is the result of scientific work carried out by the University of Alicante Research Group in Optics and Visual Perception and a multidisciplinary team (optician-optometrists, ophthalmologists, psychologists, a speech therapist and a psychiatrist) from the Alto Aragón Polyclinic in Huesca.

This study is part of the research project developed by Ph.D. student and optician-optometrist Carmen Bilbao Porta, in collaboration with Ph.D. in Vision Sciences David Piñero, who is also a member of the aforementioned UA Optics research group.

The relevance of this work lies in trying to differentiate the cases of school performance problems in which vision plays a key role (uncorrected graduation defects, for instance) from those caused by alterations produced in the brain's processing of information, such as dyslexia, dyspraxia or [attention deficit hyperactivity disorder \(ADHD\)](#).

This still unfinished study is based on internationally standardised criteria and on a sample that may be representative in Spain given the scarcity of research in this field of study.

Piñero emphasises that vision is one of the crucial senses in any learning activity since about 80 percent of the information that reaches us is made through the visual system. However, this should not lead us to think that any learning problem is necessarily due to a vision condition.

Parents should not despair when their children are underachieving at school or resort to 'saving' pseudo-therapies. UA researcher stated that we need to seek the origin of this problem with the advice of qualified health experts, as it may be due

to a visual anomaly or not, and, once determined, find possible solutions.

According to this research work, the presence of uncompensated refractive errors, such as nearsightedness, farsightedness, astigmatism, or convergence problems (difficulty in moving the eyes in a coordinated manner to look at a nearby object) or near-focus problems (accommodative) can make school tasks, such as reading and writing, difficult. However, David Piñero said that we must not confuse that with children who already have a basic reading and writing difficulty and might have another type of basic cause.

In a first stage of the study, a critical review of the scientific literature regarding vision and learning problems was carried out, finding results in which visual anomalies have been found in this type of patients, but not in all cases. Oculomotor dysfunctions (coordination problems in the different types of movements of the two eyes) have been mainly observed.

In a second part of the study, four groups of patients could be assessed in the clinical centre, one with children without learning problems and the other three corresponding to children with dyslexia, ADHD and dyspraxia, respectively.

The analysis of the data confirms the presence of altered oculomotor movement patterns in most groups of patients with learning difficulties, but not in all cases, according to this work. Therefore, this oculomotor alteration does not cause the learning problem but is sometimes an associated condition.

The study also reveals a minor difference in the prevalence of near-focus problems (with the correct graduation set) between the control group and learning disability groups. Accordingly, there are no visual anomalies in all children with learning problems, such as dyslexia, ADHD and dyspraxia, although there is a greater tendency to the

existence of alterations in oculomotor movements and convergence, which makes it necessary to analyse these aspects in this type of patients.

Provided by Asociacion RUVID

APA citation: Study shows vision is not always the cause for learning disorders (2019, March 14) retrieved 21 January 2021 from <https://medicalxpress.com/news/2019-03-vision-disorders.html>

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