

## **Dyslexia and Graphocentrism: Neuroscience Contributions**

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### **Abstract**

This study focuses on the lack of special scientific agenda of Brazilian education institutions regarding dyslexia as a Learning Disorder, which unfortunately leads not only to students' frustration, but also to a lack of interest and, consequently, it also leads to the false idea that successful reading and writing skills are the only actual proof of intelligence one may have. Interestingly, there are numerous scientific evidences showing that these atypical brains are distinguished by a visionary and entrepreneurial ability. Then, it would not be an overstatement to portray Dyslexia as a gift. Thus, we consider very important to review the supremacy of writing as a decisive assessment method, as widely adopted in Brazilian education institutions.

Keywords: Graphocentrism, Learning Disorder, Dyslexia

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## Introduction

Although dyslexia is scientifically portrayed as a hereditary disorder, it is usually during formal schooling that it turns out to be a real issue, for understandable reasons. The sad part of this story is the usual lack of grounding of Brazilian institutions regarding this Learning Disorder (LD, henceforth), which unfortunately leads to these children's cruel labels and, as a consequence, progressive lack of interest in most school subjects. Interestingly, there are numerous scientific evidences showing that individuals with dyslexia are distinguished by a visionary and entrepreneurial ability (in addition to other notable skills) which stands out when compared to neurotypical individuals (cf. Mousinho and Martins, 2012; Holanda, Correa and Mousinho, 2020).

Therefore, for some scholars, this LD, which affects from 10 to 15 percent of the world's population, can be perceived as a gift (Davis, 2004). Thus, the present study aims to review the supremacy of writing (cf. Marcuschi, 2010; Lucchesi, 2015) as a decisive assessment method.

For that purpose, it relies on Neuroscience, more precisely on Neuroscientific Image Evidence (NIE) (cf. Wolf, 2008), to increasingly contribute to a less trivial, more humanistic and diverse view of teaching, once individuals with this LD have, indeed, a quite different but a remarkable intelligence ability.

## Objectives

The main concepts regarding this preliminary study are outlined as follows: i) endorsing the human instinct for speech but not for writing (cf. Pinker, 1995; Wolf, 2008; Lucchesi, 2015); ii) claiming that it is not surprising that only around 10% of 4000 worldwide spoken languages are unwritten (Marcuschi, 2010); iii) pointing out that, although human beings have existed for over a million years, writing has only existed for around 6,000 years (Marcuschi, 2010; Wolf, 2008); iv) supporting the idea that writing is a cultural invasion and, for that reason, there is nothing natural about this act (Wolf, 2008).

## Methodology

In this review of literature, we focus on how the graphocentric paradigm has impacted Western education system. For that purpose, we also analyse the fact that History of Civilization itself is officially considered as such after the invention of Writing. Therefore, we try to make a brief literature review to claim that this scientific model unfairly dismisses unwritten languages (which are the overwhelming majority of languages). In addition, we also argue that the state of knowledge is scientifically unfair to individuals with dyslexia, who correspond to what Science usually calls neuroatypical individuals. Curiously, this model of cognition, with an imagistic thinking architecture, have notoriously contributed with genius and innovation in the history of knowledge and, therefore, in History of Civilization.

## The Drowning of an Intelligence Disconnected From the Reading Circuit

Different to what one might assume, the brain of a person with dyslexia is not hypofunctional but rather hyperfunctional. As Marianne Woolf (2008) beautifully points out "...unlike vision and speech, which are genetically organized, reading has no direct genetic program passing on to future generations" (p. 11). For that reason, neurotypical individuals create a circuit for

the act of reading. However, due to a “failure” in this reading circuit, what happens in the brain of an individual with dyslexia is an effort five times greater than reading in a neurotypical brain.

Therefore, there is more computation than a neurotypical brain, and when compared with typical brains, the Right Hemisphere (RH) is more developed than Left Hemisphere (LH). Another significant cognitive distinction is the prevalence of imagistic thinking over verbal thinking. Woolf adds “What is it about the dyslexic brain that seems linked with some people to unparalleled creativity in their professions, which often involve design, special skills, and the recognition of patterns?” (p.22)

Unfortunately, Neuroscience and neuroscientific findings and contributions are somehow disengaged with Pedagogy and teaching Course syllabus in Brazilian Institutions. Therefore, most teachers involved with reading and writing skills initiation lack the fundamental basis for understanding that there will always be neuroatypical children in their classroom, with a special brain architecture and cognition. Some neurotypical children may find it difficult to learn to read but they will eventually activate the brain circuit for that task. On the other hand, those children with LD such as Dyslexia, will always struggle with this task. Their LH occipital lobe does not engage on this reading journey as neurotypical children manage to do.

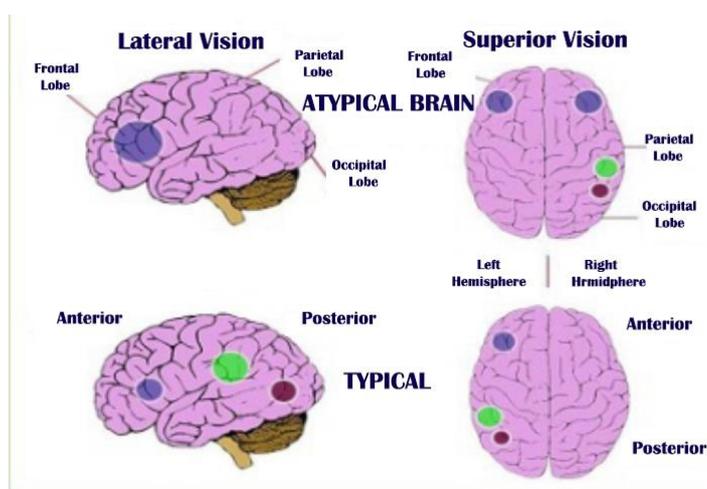


Image 1: Comparison of typical and atypical Brain activity while Reading (Uzeda-Garrão, Catunda, Lins [in press])

While reading in a typical brain is mainly carried out by the LH, the brain of an individual with dyslexia requires the activation of areas not appropriate for the reading circuit, such as the RH (as revealed in Image 1). This neural effort produces a load of cognitive fatigue, which is largely unfamiliar to Brazilian educational institutions. Therefore, they usually follow not only a written form-dependent assessment protocol, but also a reading performance assessment protocol.

Mistakenly, reading and reading comprehension ability are still considered as normal and desirable intellectual conduct, even though this human task involves the activation of a network in neurotypical brains, particularly of the occipital lobe. Therefore, more than 10% of Brazilian students will feel “drowned by letters” without actually being part of their cognition, as portrayed by Binho Ribeiro’s graffiti, specially made during the celebration of the 11<sup>th</sup> Dyslexia Week, in São Paulo.



Image 2: Graffiti by Binho Ribeiro, São Paulo, 2021

### **Final Remarks**

If we analyse the terminology assumed for periods of History, everything that precedes the invention of writing is dismissed and assumed as Prehistory. Despite this, most of the world's languages continue to be unwritten (Marcuschi, 2015) which reveals human instinct for verbalization but not for reading and writing. Therefore, a clear cognitive supremacy of speech over writing. The graphocentric paradigm deceptively authorizes educational institutions to simplistically associate intelligence to writing skills. This framework perniciously invalidates what does not match the so-called neurotypicality. Interestingly, much of civilization history has been “written” by the genius of people who have admittedly struggled with reading.

Another significant theoretical gap in Brazilian institutions is the dialogue between neuroscience and formal education. It is more than clear that State of the art education cannot ignore neuroscientific evidence contributions. Unfortunately, Neuroscience is still viewed as a very complex and distant domain when it comes to Human Sciences, such as pedagogy. This misconception jeopardizes the intrinsic relationship between brain functioning, learning and schooling.

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