



ARTICLE 1 – THE TIME DEBATE

Why should dyslexics be allowed more time and preferably the maximum allowed, when writing tests, exams and executing assignments?

In order to understand the concept of delayed visual - and auditory processing in the left hemisphere of the brain of the dyslexic child, an understanding of the neuro-anatomy of the impaired reader's brain, is imperative.

When reading a word, specific areas are activated in the left hemisphere of the brain, such as Broca's area. Consistent activation is also seen in the **parietal-temporal area** and the **visual word form area (VWFA)** which is responsible for word analysis. Neural activity can be seen in all of these areas in the brain of confident readers.

When we really learn to read, visual representations of symbols are entering through our eyes.

That means it is the responsibility of the visual cortex to process the visual stimuli that comes through our eyes, and then decisions are made as to which subsequent areas in the left hemisphere will proceed with further processing of the stimuli.

In the dyslexic reader, **overaction actually takes place in Broca's area**, which is situated in the frontal lobe of the brain. No or very little action takes place in the **angular gyrus (visual word form area)** - just behind the ear. The angular gyrus is responsible to quickly identify words as a whole. Thus, the word analysis and identification (visual analysis) areas are not activated during reading of dyslexic students and adults.

Learning to speak words is only an oral task, but **learning to read is more complex**. These children will have difficulty knowing which sound represents which symbol when reading. Even in studies done on children of only 3 years old, when looking at a word weakness was shown in that area of the brain that should identify the stimulus. Scans of 3-year-olds also showed who were at risk of being dyslexic. Before children even learn to read, at-risk neural behaviours can be seen. There are also weaknesses noticed in the speed in which children retrieve information:

In reading very **delicate time course of activities takes place**. In the 1st 15 msec. your visual cortex is notifying you that you are seeing a symbol, and another 100 milliseconds information of the lines, the curvatures etc. of the symbols are noticed.

In this **1st 200-300 milliseconds the angular gyrus** takes up the images and matches it up with the sounds, and when the word is identified, every area is activated, the meaning area etc. **Between 182 -300 msec., phonological processing** occurs and anything between **200 to 500 msec. semantic processing** occurs.

Essentially there is no activation in the left hemisphere of the brains of children with family histories of reading problems and dyslexia. They also show weaknesses in processing and speed.

A study done in 2013 where young children were tested on phonological processing when asked to specifically blend sounds into words it was found that the ability of completing

these blending tasks were directly connected to the strength of the neural networks formed in the **angular gyrus** part of the brain.

Even before children learn to read, there is always in dyslexics a weakness in processing and storing of this information about the sounds of words in the same area of the brain. Thus, dyslexics were born with this inability or disadvantage.

In Summary:

Through fMRI (Functional Magnetic Resonance Imaging), dyslexics show over-action in the frontal lobe of the left hemisphere of the brain while reading. This decoding process is time-consuming and less efficient than the instantaneous identification of symbols (graphemes) in the Angular Gyrus in non-impaired readers.

Essentially this means that dyslexic readers take up to 5 to 6 times longer to decode text with little to no attention span available to comprehend what they have just read.

Research has also shown delayed development in processing speed, working memory and executive functioning in the dyslexic person.

It is therefore of utmost importance to give the dyslexic child the maximum time allowed, regardless of the severity of their dyslexia diagnosis, to complete assignments, assessments, tests and exams.

Dyslexia is an invisible disability, the impact of which is not different from a paraplegic, deaf or blind person.

A blind child is not only blind during exams or tests.

A deaf child is not only deaf during exams or tests.

A paralyzed child is not only paralyzed during exams or tests.

And a dyslexic child is not only dyslexic during tests and exams. They need all the support and assistance possible to reach their full potential.

