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Website Updates
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Reading and Facial Recognition

- 1. Research has shown that the left fusiform gyrus word form area processes faces in illiterate people and is co-opted to process written orthography in literate people.**
- 2. When a person reads pseudo words (phonemically regular) an entire pool of neurons fire in the left fusiform gyrus word form area, but when they read a real word specific neurons fired. The left fusiform gyrus responds to the orthography of the word, not the meaning. It is creating a sight word vocabulary.**

Glezer, L.S., et al. (March 25, 2015). Adding Words to the Brain's Visual Dictionary: Novel Word Learning Selectively Sharpens Orthographic Representations in the VWFA. Journal of Neuroscience, 35(12), 4965-4972.

Sutherland, S. (July/August, 2015) What Happens in the Brain When We Read? We Recognize Words as Pictures, Scientific American, Mind, 26(4), 14.

Hearing Words in Our Minds as We Read

Italian researchers found that when they recorded the electrical activity directly from the Broca area in the language dominant hemispheres of the brains of 16 surgical patients who were asked to read aloud and silently that the subjects produced the sounds of the words in their heads in both situations. This tends to indicate people recognize words when they read by their shape and how they sound. It also tends to show that people “hear” the words in their heads before they speak them aloud and as they process them when heard or read.

Magrassi, L., et al. (February 10, 2015). Sound representation in higher language areas during language generation. PNAS, 112(6), 1868-1873.

Sutherland, S. (July/August, 2015). What Happens In the Brain When We Read? We Hear Written Words In Our Head. Scientific American, Mind, 26(4), 14.

How We Read

- **Angular Gyrus: Allows us to comprehend movements of characters as we read**
- **Right Parieto-Temporal Cortex: Helps process longer and complex sentences.**
- **Right Posterior Superior Temporal Gyrus: Theory of mind and keeps track of characters**
- **Broca's Area: Creates the sounds of the words we read in our heads**
- **Visual Word Form Area: Recognizes orthography**
- **Wernicke's Area: Comprehension and recalling what we read**

Sutherland, S. (July/August, 2015). Deciphering the Written Word. Scientific American, Mind, 26(4), 14.

Using Declarative Memory To Compensate for Disabilities

Scientists from Georgetown University reviewed the literature related to dyslexia, specific language impairment, autism spectrum disorder, obsessive-compulsive disorder, and Tourette's disorder and found that using and developing ones' declarative memory can be helpful as a work around for each of these disorders. The hippocampus and other declarative memory areas appear to be involved in this.

Ullman, M.T., et al. (April, 2015). A compensatory role for declarative memory in neurodevelopmental disorders. Neuroscience and Biobehavioral Reviews, 51, 205-222.

New Research on Touch

- **There are three types of nerve fibers related to touch:**
 - **A-beta** =- they discriminate what is felt, are all over the body (especially the palm), are highly myelinated and send messages very fast.
 - **Two different types of C fibers that detect pain and itches** – The information these transmit moves slower, but is richer
 - **C-tactile, or CT fibers**- found on the hairy skin of the back and forearm, tuned to gentle touch, temperature, light touch, slow transmitting

New Research on Touch

- **The CT Fibers appear to be geared more to feeling than sensing, and touch that is rewarding**
- **Touch is the first sense to develop in utero and is the most developed at birth**
- **People with autism appear to have difficulty with the CT-fiber system and forming social bonds; they often do not find gentle stroking as rewarding**

Denworth, L. (July/August, 2015). The Social Power of Touch. Scientific American, Mind, 26(4), 30-39.

Characteristics of AD/HD Remitters

- **A poster at the 5th World Congress on AD/HD in Glasgow, Scotland found that those whose symptoms of AD/HD remit in young adulthood are those with improved evoked-related potentials, and cognitive attention-vigilance and error-processing where persisters did not have these improvements.**

Michelini, G., et al. (May 29, 2015). Do cognitive and neurophysiological impairments on a performance monitoring task distinguish between ADHD persisters and remitters? Poster presented at the 5th Annual World Congress on AD/HD, Glasgow, Scotland, May 28-31.

Restless Leg Syndrome and AD/HD

- **Researchers from the Netherlands reported research that indicated there is a high rate of comorbidity between restless leg syndrome and AD/HD, hyperactive/impulsive presentation in adults. They recommended the restless leg syndrome be treated first in order to get a better idea of how the person manifests their AD/HD symptoms.**

Snitselaar, M., et al. (May 29, 2015). Prevalence of restless legs syndrome in adult ADHD and its subtypes. Poster presented at the 5th Annual World Congress on AD/HD, Glasgow, Scotland, May 28-31.

Sleep and Sluggish Cognitive Tempo

US researchers found that 17% of children with sluggish cognitive tempo have diminished sleep and many need to catch up on their sleep on weekends. This may cause sleepiness and anxiety in such children.

Becker, S., et al. (May 29, 2015). Sleep functioning in children with ADHD predominantly inattentive type and associations with internalizing, oppositional, and sluggish cognitive tempo symptoms. Poster presented at the 5th Annual World Congress on AD/HD, Glasgow, Scotland, May 28-31.

Speech Language Disorder and AD/HD

Tunisian researchers found that speech language disorder occur far more frequently than by chance in AD/HD children.

Gaddour, N., et al. (May 29, 2015). Connection between developmental language disorders and ADHD. Poster presented at the 5th Annual World Congress on AD/HD, Glasgow, Scotland, May 28-31.

AD/HD and Dyslexia

- **German researchers found that AD/HD can cause problems with reading related to attention and that the comorbidity of AD/HD and dyslexia may be a subtype disorder.**

Gunter, T., et al. (May 29, 2015). Attentional dysfunction and its impact on reading performance in children with ADHD, dyslexia and the combined condition. Poster presented at the 5th Annual World Congress on AD/HD, Glasgow, Scotland, May 28-31.

SCT and Facial Expressions

- **Brazilian researchers discovered that children with SCT were worse at recognizing facial expressions of surprise, fear, and facial expressions overall than their non-disabled peers. This was linked to white matter anomalies in the SCT children.**

Rossi, A., et al. (May 29, 2015). Emotional recognition and white matter abnormalities in ADHD-I. Poster presented at the 5th Annual World Congress on AD/HD, Glasgow, Scotland, May 28-31.

Empathy in the AD/HD Teen

- **South Korean researchers used fMRI imagery and found that adolescents with AD/HD have significant deficits in the clinical and neurological aspects of empathy when compared to their non-impaired peers.**

Jung-Woo, S. et al., (May 29, 2015). An fMRI study on neural systems for empathy in ADHD. . Poster presented at the 5th Annual World Congress on AD/HD, Glasgow, Scotland, May 28-31.

The *5-HTTLPR* Genotype, Stress and AD/HD

The researchers speculated that those who had the short allele of the *5-HTTLPR* genotype with AD/HD would have more susceptibility to stress and differences in their grey matter in attentional areas than those with AD/HD and the longer allele of the genotype. Those with the shorter genotype had more severe symptoms of AD/HD and anxiety as well as less grey matter volume in their frontal poles and anterior cingulate gyrus’.

Van der Meer, D., et al. (January 26, 2015). Brain Correlates of the Interaction Between *5-HTTLPR* and Psychosocial Stress Mediating Attention Deficit Hyperactivity Disorder Severity. *American Journal of Psychiatry*. DOI: [10.1176/appi.ajp.2015.14081035](https://doi.org/10.1176/appi.ajp.2015.14081035).

Movement, Attention and AD/HD

Researchers monitored the physical movements of AD/HD children and their non-impaired peers and found that clinically significant AD/HD symptoms is related to excessive motor activity. They speculated AD/HD children engage in excessive movement to compensate for their difficulties in attention and alertness.

Haranto, T.A., et al., (June 10, 2015). A trial-by-trial analysis reveals more intense physical activity is associated with better cognitive control performance in attention-deficit/hyperactivity disorder. Child Neuropsychology. DOI: 10.1080/09297049.2015.1044511.

Is Number Sense The Core of Dyscalculia?

Researchers from Hong Kong compared children with developmental dyscalculia (DD) to those who are low-achieving in math. Those with DD had deficits in non-symbolic number sense and mapping the magnitude of numbers. The low-achieving children only had problems in mapping number magnitude. The researchers saw this as a confirmation that number sense is the core of developmental dyscalculia.

Wong, T. T-Y., et al. (June 8, 2015). Defective Number Sense or Impaired Access? Differential Impairments in Different Subgroups of Children With Mathematics Difficulties. Journal of Learning Disabilities. DOI: 10.1177/0022219415588851.

Number Estimation in Dyscalculic Adults

An Israeli researcher found that while adults with dyscalculia calculation estimations were significantly worse than control adults their responses were better than chance. As the size of the calculation estimations went down the accuracy of the controls improved, but this did not happen in the dyscalculics. The dyscalculics used approximated calculation methods much more than an number sense of magnitude to estimate, whereas the controls had more of a number sense. The research interpreted this that adults with dyscalculia continue to have problems with number sense in adulthood.

Ganor-Stern, D. (May 26, 2016). Can Dyscalculics Estimate the Results of Arithmetic Problems? Journal of Learning Disabilities. DOI: 10.1177/0022219415587785.

Problematic Symptoms of AD/HD College Students

Canadian researchers found that college students with AD/HD experience significant manifestations of daily psychological distress, cognitive failure, and executive function difficulties as well as those symptoms related to AD/HD. However, their academic fluency and executive function were above normal compared to the general population.

Gray, S.A., et al. (March 16, 2015). Symptom Manifestation and Impairments in College Students With ADHD. Journal of Learning Disabilities. DOI: 10.1177/0022219415576523.

AD/HD & Obesity

Researchers from Turkey postulated that obese children with AD/HD may have a low adiponectin level and high Leptin/ adiponectin level that may be at the root of their obesity.

Ozcan, O., et al. (June 15, 2015). Plasma Leptin, Adiponectin, Neuropeptide Y Levels in Drug Naive Children With ADHD. Journal of Learning Disabilities. DOI: [10.1177/1087054715587095](https://doi.org/10.1177/1087054715587095).

AD/HD Vs. DMDD

Turkish scientists compared children with AD/HD, Combined Presentation to those with disruptive mood dysregulation disorder (DMDD) and found the latter groups scores on communication and affective responsiveness difficulties were significantly higher than the former. They went on to conclude that AD/HD and DMDD were separate and distinct disorders.

Uran, P., et al. (June 15, 2015). Family Functioning, Comorbidities, and Behavioral Profiles of Children With ADHD and Disruptive Mood Dysregulation Disorder. Journal of Learning Disabilities. DOI: 10.1177/1087054715588949.

Group Treatment of Adults with ASD

A recent literature review tentatively concluded that group social skills treatment of high functioning adults on the autism spectrum is effective social functioning, social knowledge, and social understanding as well as reducing loneliness and the severity comorbid psychiatric disorders.

Spain, D., et al. (June 4, 2015). Group social skills interventions for adults with high-functioning autism spectrum disorders: A systematic review. Autism. DOI: 10.1177/1362361315587659.

Emotional Processing in ASD

Recently researchers found that the ability of those with autism spectrum disorder to interpret facial expressions of emotion predicted their ability to properly interpret vocal speech emotions. This the researchers postulated could account for their problems with prosody.

Globerson, E., et al. (April, 2015). Prosody Recognition in Adults With High-Functioning Autism Spectrum Disorders: From Psychoacoustics to Cognition. Autism Research, 8(2), 153-163.

Brain Autoimmune System and ASD

Recently scientists have discovered through brain imagery that brain has a lymphatic system. This caused the scientists postulated may indicate disorders like autism may have some link to inflammation.

Louveau, A., et al. (June 1, 2015). Structural and functional features of central nervous system lymphatic vessels. Nature. DOI: 10.1038/nature14432.