Developmentally Disconnected: Evidence-Based Tools for Transforming Social Competence January/February 2014 Update

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Genetics and Neurology of ASD

- ➤ "It is now abundantly clear that ASD has a genetic Component, with the best evidence suggesting moderate genetic heritability" (p. 41).
- ➤ "One of the more reliable findings of brain involvement in ASD is a decrease of Purkinje cells, which results in the reduction of the size of the cerebellum...These cells are primarily involved in motor responses, and the pattern of their loss in those with ASD suggests that they are damaged prenatally" (p. 50).

Durand, M.V. (2014). <u>Autism Spectrum</u>
<u>Disorder: A Clinical Guide for General</u>
<u>Practitioners</u>. Washing, DC: American
Psychological Press.

ASD Children and Peers

"The social interaction of children with ASD can be facilitated by peer solicitation; however, it may be accompanied by increased stress. The children with ASD that have the highest level of cortisol show less social motivation; yet, it is unclear if it reflects an underlying state of heightened arousal or enhanced reactivity to social engagement, or both".

Corbett, B.A., et al. (December 12, 2013).
Biobehavioral profiles of arousal and social motivation in autism spectrum disorders.

Journal of Child Psychology and Psychiatry.
DOI: 10.1111/jcpp.12184.

Barkley Wants To Call SCT/Crichton Syndrome" Concentration Deficit Disorder

Barkley, R.A. (November 2013). A Plea to Rename Sluggish Cognitive Tempo (SCT) as Concentration Deficit Disorder (CDD). The ADHD Report, 21(7), 1-4.

Barkley's Explanation of Pathological Mind Wandering

"Mind-wandering is a normally occurring feature of human cognition in which an individual may be performing some routine and simple primary task that requires little effortful processing freeing up executive functioning capacity and other higher -level cognitive abilities to engage in some secondary task or goal, such as thinking about one's upcoming workday schedule while driving...

Barkley's Explanation of Pathological Mind Wandering

"...However, when such mind-wandering interferes with performance of a primary task, as when a person driving to work misses the turn into their parking lot, and this kind of circumstance occurs frequently to produce significant impairment then it can be considered pathological" (p. 3).

Barkley, R.A. (November 2013). A Plea to Rename Sluggish Cognitive Tempo (SCT) as Concentration Deficit Disorder (CDD). The ADHD Report, 21(7), 1-4.

Morality and AD/HD

"Finally, the hypothesis that individuals who demonstrate higher levels of ADHD symptomatology would demonstrate higher levels of moral relativism was not supported. This finding may imply that when it comes to following universal morals, there are no differences between individuals in high and low ADHD symptomatology groups" (p. 8).

Chung, H.J., et al. (November, 2013). The Relationship Among ADHD Symptomology, Executive Functions, Morality, and Humor. <u>The ADHD Report</u>, <u>21</u>(7), 5-9.

Humor and AD/HD

In appears those with AD/HD may have problems comprehending humor.

Chung, H.J., et al. (November, 2013). The Relationship Among ADHD Symptomology, Executive Functions, Morality, and Humor. <u>The ADHD Report</u>, <u>21(7)</u>, 5-9.

Driving, Texting and AD/HD

"Results Adolescents with ADHD reported fewer months of driving experience and a higher proportion of driving violations than control subjects. After controlling for months of driving history, adolescents with ADHD demonstrated more variability in speed and lane position than control subjects. There were no group differences for braking reaction time. Furthermore, texting negatively impacted the driving performance of all participants as evidenced by increased variability in speed and lane position..."

Driving, Texting and AD/HD

"...Conclusions To our knowledge, this study is one of the first to investigate distracted driving in adolescents with ADHD and adds to a growing body of literature documenting that individuals with ADHD are at increased risk for negative driving outcomes. Furthermore, texting significantly impairs the driving performance of all adolescents and increases existing drivingrelated impairment in adolescents with ADHD, highlighting the need for education and enforcement of regulations against texting for this age group" (p. 933).

Narad, M., et al. (October, 2013). Impact of Distraction On Driving Performance On Adolescents with and without Attention-Deficit/Hyperactivity Disorder. JAMA Pediatrics, 167(10), 933-938. doi:10.1001/jamapediatrics.2013.322.

Exercise and AD/HD

"Results: Lack of physical activity was shown to relate to depressed affect, more strongly in participants with severe hyperactivity symptoms (Study 1). The physically active participants showed improved executive functioning after only 5 min of vigorous activity; the sedentary control participants showed no improvement (Study 2). Conclusion: These results indicate that interventions to increase the level of physical activity in children with and without ADHD might improve affect and executive functioning".

Gawrilow, C., et al. (July, 2013). Physical Activity, Affect, and Cognition In Children with Symptoms of ADHD. <u>Journal of Attention Disorders</u>, doi: 1087054713493318.

AD/HD, Executive Function and Physical Activity

"Results: The ADHD group exhibited significantly more motor activity relative to the HC group, and both groups exhibited greater activity during PH and VS WM tasks, relative to control conditions. Finally, the central executive (CE) and PH storage/rehearsal subsystems were associated with large-magnitude between-group differences in activity. Conclusion: Findings suggest that increased demands on WM, particularly the CE and PH storage/rehearsal, contribute to ADHD-related hyperactivity, though a portion of excessive motor activity in adults with ADHD may occur independently of WM demands."

Hudec, K.L., et al. (July 30, 2013). Working Memory Contributes to Elevated Motor Activity in Adults With ADHD: An Examination of the Role of Central Executive and Storage/Rehearsal Processes. Journal of Attention Disorders, doi: 1087054713497398.

Substance Dependence, Methylphenidate and AD/HD

"This is the first randomized clinical trial to demonstrate the efficacy of a stimulant treatment for substance dependent individuals with ADHD. The treatment with MPH (Methylphenidate, sic.) led to reduction in drug use and a clinically relevant improvement of ADHD symptoms" (p. 1).

Konstenius, M., et al. (2013). Methylphenidate for ADHD in adults with substance dependence: A 24-week randomized placebo-controlled trial. <u>European Psychiatry</u>, <u>28</u>(Supplement 1), doi:10.1016/S0924-9338(13)76230-8.

Psychostimulants, The Brain and AD/HD

"Despite the inherent limitations and heterogeneity of the extant MRI literature, our review suggests that therapeutic oral doses of stimulants decrease alterations in brain structure and function in subjects with ADHD relative to unmedicated subjects and controls. These medication-associated brain effects parallel, and may underlie, the wellestablished clinical benefits" (p. 902)

Spencer, T.J., et al. (September 2013). Effect of psychostimulants on brain structure and function in ADHD: a qualitative literature review of magnetic resonance imaging-based neuroimaging studies. <u>Journal of Clinical Psychiatry</u>, 74(9), 902-917. DOI: 10.4088/JCP.12r08287.

Stimulants, The Cerebellum and AD/HD

"Relative to comparison participants, youths with ADHD exhibited smaller regional volumes corresponding to the lateral surface of the left anterior and the right posterior cerebellar hemispheres. Stimulant medication was associated with larger regional volumes over the left cerebellar surface, whereas more severe ADHD symptoms were associated with smaller regional volumes in the vermis. We used optimized measures of morphology to detect alterations in cerebellar anatomy specific to ADHD, dimensions of symptomology, and stimulant treatment. **Duration of treatment correlated positively with volumes** of specific cerebellar subregions, supporting a model whereby compensatory morphological changes support the effects of stimulant treatment" (p. 718).

Ivanov, I., et al. (February, 2014). Cerebellar morphology and the effects of stimulant medications in youths with attention deficit-hyperactivity disorder.

Neuropsychopharmacology, 39(3), 718-726.

DOI: doi: 10.1038/npp.2013.257.

Stroke, Simulants and Childhood AD/HD

"No significant associations were found between stroke and use of ADHD stimulants in this study rigorously identifying pediatric stroke outcomes over a 14-year period. The OR for current use was similar to that found in a large cohort study".

Hills, N.K., eta al. (February 11, 2014). Pediatric Stroke and Vascular Malformations Moderated Poster Tour:

<u>American Heart Association International Stroke Conference 2014, "Stimulant Medications as a Risk Factor for Childhood Stroke" American Stroke Association, "ADHD drugs not linked to increased stroke risk among children"</u>. International Stroke Conference Moderated Poster Abstracts, American heart Association/American Stroke Association. Abstract M P110: from website:

http://stroke.ahajournals.org/content/45/Suppl 1/AWMP110.abstract?sid=d4dd4792-e2d0-484a-b333-9691831ee437.

AD/HD & Low Dose Treatments

"Placebo and three doses of methylphenidate (MPH) were crossed with 3 levels of behavioral modification (no behavioral modification, NBM; low-intensity behavioral modification, LBM; and high-intensity behavior modification, HBM) in the context of a summer treatment program (STP). Participants were 48 children with ADHD, aged 5-12. Behavior was examined in a variety of social settings (sports activities, art class, lunch) that are typical of elementary school, neighborhood, and after-school settings. Children received each behavioral condition for 3 weeks, order counterbalanced across groups. Children concurrently received in random order placebo, 0.15 mg/kg/dose, 0.3 mg/kg/dose, or 0.6 mg/kg/dose MPH, 3 times daily with dose manipulated on a daily basis in random order for each child..."

AD/HD & Low Dose Treatments

"...Both behavioral and medication treatments produced highly significant and positive effects on children's behavior. The treatment modalities also interacted significantly. Whereas there was a linear dose-response curve for medication in NBM, the doseresponse curves flattened considerably in LBM and HBM. Behavior modification produced effects as large as moderate doses, and on some measures, high doses of medication. .. Results illustrate the importance of taking dosage/intensity into account when evaluating combined treatments; there were no benefits of combined treatments when the dosage of either treatment was high but combination of the low-dose treatments produced substantial incremental improvement over unimodal treatment".

Pelham, W.E., et al. (January, 2014). A Dose-Ranging Study of Behavioral and Pharmacological Treatment in Social Settings for Children with ADHD. <u>Journal of Abnormal Child Psychology</u>. DOI:10.1007/s10802-013-9843-8.

Neuropsychological Interventions and AD/HD

"Interventions that enhance neuropsychological functioning at an early age may be beneficial in attenuating long-term ADHD severity and impairment" (p. 1205).

Rajendran, K., et al. (October 1, 2013). Association between variation in neuropsychological development and trajectory of ADHD severity in early childhood. <u>American Journal of Psychiatry</u>, <u>170(1)</u>, 1205-1211. doi: 10.1176/appi.ajp.2012.12101360.

SES and AD/HD

"...ADHD was associated with a range of indicators of social and economic disadvantage including poverty, housing tenure, maternal education, income, lone parenthood and younger motherhood. There was no evidence to suggest childhood ADHD was a causal factor of socioeconomic disadvantage: income did not decrease for parents of children with ADHD compared to controls over the 7-year study period. No clinical bias towards labelling ADHD in low SES groups was detected. There was evidence to suggest that parent attachment/family conflict mediated the relationship between ADHD and SES...Although genetic and neurological determinants may be the primary predictors of difficulties with activity level and attention, aetiology appears to be influenced by socioeconomic situation.

Ford, R.G., et al. (November 26, 2013). The association of attention deficit hyperactivity disorder with socioeconomic disadvantage: alternative explanations and evidence.

Journal of Child Psychology and Psychiatry.
DOI: 10.1111/jcpp.12170.

Executive Function and AD/HD

"There were significant EF (Executive Function, Sic.) (spatial working memory, spatial planning and verbal working memory) and low-EF (signal detectability, spatial span and visual recognition memory) impairments in persistent and subsyndromal ADHD. The impairments in EF were independent of low-EF despite significant moderate correlations between any two of these tasks. Adolescents with remitted ADHD showed no deficit in either EF or low-EF...This study suggests that adolescents with persistent and subsyndromal ADHD have EF and low-EF impairments that might contribute to ADHD independently.

Lin, Y.J., et al. (September 27, 2013). Neuropsychological functions among adolescents with persistent, subsyndromal and remitted attention deficit hyperactivity disorder.

<u>Psychological Medicine</u>. From website: http://www.ncbi.nlm.nih.gov/pubmed/24074179.

Prenatal Exposure of Alcohol

"We document novel anatomical and gene expression abnormalities in the neocortex of newborn mice exposed to ethanol in utero. This is the first study to demonstrate largescale changes in intraneocortical connections and disruption of normal patterns of neocortical gene expression in any prenatal ethanol exposure animal model. Neuroanatomical defects and abnormal neocortical RZRB, Id2, and Cadherin8 expression patterns are observed in PrEE newborns, and abnormal behavior is present in 20-d-old PrEE (Prenatal Exposure of Alcohol, Sic.) mice. The vast network of neocortical connections is responsible for high-level sensory and motor processing as well as complex cognitive thought and behavior in humans. Disruptions to this network from PrEE-related changes in gene expression may underlie some of the cognitive-behavioral phenotypes observed in children with FASD" (p. 18,893).

El Shawa, H., et al. (November 27, 2013).

Prenatal Ethanol Exposure Disrupts
Intraneocortical Circuitry, Cortical Gene
Expression, and Behavior in a Mouse Model
of FASD. Journal of Neuroscience, 33(48):
18893-18905. DOI: 10.1523/JNEUROSCI.372113.2013.

Communication in Adults with AD/HD

"Individuals with high levels of ADHD symptoms, especially inattention, are less efficient in their ability to use another's perspective during conversation" (p. 589).

Nielsen, E.S., et al. (January 31, 2012). Communicative Perspective-Taking Performance of Adults With ADHD Symptoms. <u>Journal of Attention Disorder</u>, <u>17</u>(7), 589-597. DOI: 10.1177/1087054711428947.

Communication in Children with AD/HD

"Results: Behavioral and eye movement measures revealed that children with ADHD made more interpretive errors and were less likely to consider target referents across the 2 communicative conditions. Furthermore, ADHD symptoms related to children's performance on the communicative task and to parental report of the child's pragmatic skills. Conclusion: Children with ADHD are less accurate in their interpretations of referential statements. Such difficulties would lead to greater occurrences of miscommunication" (P. 590).

Nilsen, E.S., et al. (April, 2013). Referential Communication in Children With ADHD: Challenges in the Role of a Listener. <u>Journal of Speech, Language & Hearing Research</u>, <u>56(2)</u>, 590-603.

AD/HD Coaching With College Students

"The effects of coaching on learning and study skills, self-regulation, and subjective well-being of students with ADHD attending 2- and 4-year colleges or universities was examined. Students were randomly assigned to participate in coaching or comparison groups. Coaching students received weekly phone-based coaching sessions and additional check-ins from the coaches. Students' learning, study, and selfregulation skills were measured by use of the **Learning and Study Strategies Inventory** (LASSI)..."

AD/HD Coaching With College Students

"... The College Well-Being Scale (Field, Parker, Sawilowsky & Rolands, 2010) was used to measure participants' well-being. The coaching group had a statistically significant higher total LASSI score and statistically significant higher scores on all three LASSI clusters (i.e., Skill, Will, and Self-Regulation) than the comparison group. Well-Being scores were statistically significantly higher for students in coaching than for comparison group students, when corrected for initial differences in executive functioning. Coaching was highly effective in helping students improve their learning and executive functioning skills" (P. 83)

Field, S., et al. (2013). Assessing the Impact of **ADHD Coaching Services on University Students'** Learning Skills, Self-Regulation, and Well-Being. Journal of Higher Education and Disability, 26(1), 83-101. From website: http://www.google.com/url?sa=t&rct=j&q=&esr c=s&source=web&cd=2&ved=0CCsQFjAB&url=ht tp%3A%2F%2Fwww.ahead.org%2Fuploads%2Fp ublications%2FJPED%2Fjped26 1%2Fjped26 1.d oc&ei=40j8UvtlqKGyAGAtlCoCg&usg=AFQjCNHPwgrvpUjStLHX aFjuXlYfvisXBA&bvm=bv.61190604,d.aWc

Mindfulness & AD/HD

"The majority of participants completed the training and reported high satisfaction with the training. Pre-post improvements in selfreported ADHD symptoms and test performance on tasks measuring attention and cognitive inhibition were noted. Improvements in anxiety and depressive symptoms were also observed. **Conclusion: Mindfulness training is a feasible** intervention in a subset of ADHD adults and adolescents and may improve behavioral and neurocognitive impairments. A controlled clinical study is warranted" (p. 1).

Zylowska, L., et al. (November 19, 2007).

Mindfulness Meditation Training in Adults and Adolescents With ADHD. Journal of Attention Disorders. DOI: 10.1177/1087054707308502.

Mindfulness and Attention

"Results demonstrated MT-related benefits in SART performance. Relative to the control group, MT participants had higher task accuracy and self-reported being more "on-task" after the 7-week training period. MT did not significantly benefit the operation span task or accuracy on the delayed-recognition task. Together these results suggest that while short-form MT did not bolster working memory task performance, it may help curb mind wandering and should, therefore, be further investigated for its use in academic contexts".

Morrison, A.B., et al. (January 6, 2014). Taming a wandering attention: Short-form mindfulness training in student cohorts.

<u>Frontiers In Human Neuroscience</u>. DOI: 10.3389/fnhum.2013.00897.

Suicide and AD/HD

"The current findings suggest that the presence of combined HI/IA (ADHD, Hyperactive/Impulsive/ADHD Inattentive, Sic.) symptoms conveys increased suicide risk for depressed college students. Additionally, results suggest a complex relationship between independent HI and IA symptoms and severe suicidal outcomes" (p. 980).

Patros, C.H., et al. (September, 2013). Symptoms of attention-deficit/hyperactivity disorder (ADHD) moderate suicidal behaviors in college students with depressed mood. <u>Journal of Clinical Psychology</u>, <u>69(9)</u>, 980-983. DOI: 10.1002/jclp.21994. Epub 2013 Jun 17.

Suicide and AD/HD

"Depression appears to play an important mediating role in suicidal ideation for college students with ADHD, and specific emotion regulation deficits appear to amplify the effects of ADHD on depression and suicidal ideation".

Van Eck, K., et al. (January 27, 2014). ADHD and Suicidal Ideation: The Roles of Emotion Regulation and Depressive Symptoms Among College Students. <u>Journal of Attention Disorders</u>. DOI: 10.1177/1087054713518238.

Workshop for Adolescents with AD/HD

"Our expectations regarding changes in opinions about ADHD from pre- and post intervention were also partially supported. Adolescents demonstrated more favorable opinions of pharmacological interventions for ADHD immediately following the workshop, but this change did not persist through the follow-up phase. Opinions of psychosocial interventions alternative treatments did not change, which was unexpected given that much of the workshop focused on providing adolescents information about evidence-based treatments, including both pharmacological and psychosocial interventions" (p. 4-5).

Blotnicky-Gallant, P. (December, 2013). Evaluating a Demystification Program for Adolescents with AD/HD. The ADHD Report, 21(8), 1-6.

Exercise and AD/HD

"Children with ADHD (n = 21, 11.3 ± 1.8 yrs) and children without ADHD (n = 21, $11.6 \pm 1.9 \text{ yrs}$) participated in the study. After performing an initial exercise test to measure peak aerobic exercise capacity, the children reported to the laboratory for 2 additional trials. For children with ADHD one trial was performed off medication and the other trial occurred on medication. During each testing session the Connor's Continuous Performance Test II (CCPT II) was performed immediately before and after 20 minutes of intermittent exercise (30 sec exercise/30 sec rest) at 90% of peak aerobic work rate..."

Exercise and AD/HD

"...Errors of omission, errors of commission, and reaction time (t-scores) were assessed from the CCPT II. The data were analyzed with a 3-way (group x trial x time) MANOVA. There was a significant increase in the error of omission t-score over time (pre to post exercise). There were no significant findings for the error of commission t-score. In the ADHD group the reaction time score was significantly higher than children without ADHD, significantly decreased with medication, and significantly increased over time. No other interaction or main effects were observed" (p. 65).

Mahon, A.D., et al.(2013). Acute Exercise Effects on Measures of Attention and Impulsivity in Children with Attention Deficit/Hyperactivity Disorder. <u>Journal of Educational and developmental Psychology</u>, 3(2), 65-73. DOI: 10.5539/jedp.v3n2p65.

AD/HD and Antisocial Personality Disorder

"There is an increased risk for children with ADHD with or without comorbid CD to develop later onset of antisocial personality disorder".

Storebø, O.J., et al. (November 27, 2013). The Association Between ADHD and Antisocial Personality Disorder (ASPD): A Review. <u>Journal of Attention Disorders</u>, DOI: 10.1177/1087054713512150.

AD/HD and Violence

"The direct effect of ADHD on violence is only moderate at the population level, driven by hyperactivity, and involving intimate partners and close persons. Because violence associated with severe ADHD is explained by co-existing psychopathology, interventions should primarily target co-existing disorders".

Gonzalez, R.A., et al. (September 14, 2013). Adult Attention Deficit Hyperactivity Disorder and Violence in the Population of England: Does Comorbidity Matter? <u>PLOS ONE</u>. DOI: 10.1371/journal.pone.0075575.

Sluggish Cognitive Tempo

"Study 1 results supported the factor structure of the BAARS-IV, with the optimal model comprising 4 correlated but distinct factors: SCT, Inattention, Hyperactivity, and Impulsivity. After controlling for correlated demographic variables and ADHD symptoms, SCT was significantly related to academic impairment (including grade point average), anxiety, and depression. In Study 2, SCT again contributed unique variance to internalizing symptoms and academic impairment after controlling for correlated participant characteristics (i.e., sex, age, race, parent education level, family income, ADHD medication use, and mental health service utilization) and ADHD symptom severity..."

Sluggish Cognitive Tempo

"These results fill an important gap in the literature by (a) confirming SCT to be distinct from ADHD in emerging adulthood, (b) demonstrating SCT to be strongly linked to college student adjustment, and (c) providing support for the hypothesis that SCT is associated with psychosocial functioning in both individuals with and without ADHD".

Becker, S.P., et al. (September 24, 2013). Sluggish Cognitive Tempo is Associated With Academic Functioning and Internalizing Symptoms in College Students With and Without Attention-Deficit/Hyperactivity Disorder. <u>Journal of Clinical Psychology</u>. DOI: 10.1002/jclp.22046.

Neuroimaging of AD/HD Findings

"Neuroimaging studies provide a multitude of information that currently allows us to expand the notions of ADHD neurobiology beyond its traditional understanding as a manifestation of frontostriatal dysfunction. They point to disorders of several other areas of the brain, particularly the anterior cingulum, the dorsolateral as well as ventrolateral prefrontal cortex, the orbitofrontal cortex, the superior parietal regions, the caudate nucleus, the thalamus, the amygdala and the cerebellum. Imaging studies point to the persistence of changes in both brain structure and function into adulthood, although there might be a tendency for improvement of caudate nucleus pathology..."

Neuroimaging of AD/HD Findings

"...Changes in neuronal (dendritic) plasticity, which are under the modulatory influence of the dopaminergic system, may be in the background of disorders of brain morphology and anatomical connectivity with subsequent brain dysfunction. Growing evidence suggest that methylphenidate treatment can lead to improvement of brain changes seen in neuroimaging by its positive effect on neuroplasticity... Changes in neuronal plasticity may be behind persisting brain changes in ADHD. Current treatment approaches seem to improve these neuroplastic processes, and, therefore, may have a positive effect on the neuropathology of ADHD".

Kasparek, T., et al. (October 4, 2013).

Neurobiology of ADHD From Childhood to Adulthood: Findings of Imaging Methods.

Journal of Attention Disorders.

10.1177/1087054713505322.

33 Year Follow-Up of Children with AD/HD

"Probands had significantly worse educational, occupational, economic, and social outcomes; more divorces; and higher rates of ongoing ADHD (22.2% vs 5.1%, P < .001), ASPD (16.3% vs 0%, P < .001), and SUDs (14.1% vs 5.1%, P = .01) but not more mood or anxiety disorders (P = .36 and .33) than did comparison participants. Ongoing ADHD was weakly related to ongoing SUDs (ϕ = 0.19, P = .04), as well as ASPD with SUDs (ϕ = 0.20, P = .04). During their lifetime, probands had significantly more ASPD and SUDs but not mood or anxiety disorders and more psychiatric hospitalizations and incarcerations than comparison participants..."

33 Year Follow-Up of Children with AD/HD

"... Relative to comparisons, psychiatric disorders with onsets at 21 years or older were not significantly elevated in probands. Probands without ongoing psychiatric disorders had worse social, but not occupational, functioning. **CONCLUSIONS** The multiple disadvantages predicted by childhood ADHD well into adulthood began in adolescence, without increased onsets of new disorders after 20 years of age. Findings highlight the importance of extended monitoring and treatment of children with ADHD"(p. 1295).

Klein, R.G., et al. (December, 2012). Clinical and Functional Outcome of Childhood Attention-Deficit/Hyperactivity Disorder 33 Years Later. Archives of General Psychiatry, 69(12), 1295-1303. DOI: 10.1001/archgenpsychiatry.2012.271.

Parent Training and AD/HD

"Effects were found in the children's reported AD/HD behaviours at home and at school after 12 months. Large effect sizes were also found in mothers' variables: a decrease in selfreported dysfunctional parenting practices and an improved sense of competence and observed positive parenting. However, the improvements in coaching skills that have been observed after 6 months of follow-up decreased over time. No other significant differences were found between 6 and 12 months follow-up, with small effect sizes indicating that the significant postintervention changes in child and parenting measures were maintained..."

Parent Training and AD/HD

"... After 12 months of follow-up, there was a clinically important reduction of over 30 % in reported AD/HD behaviours in 59 % of children. The sustained effects observed both for children and their mothers suggest long-term benefits of IY. Therefore, efforts should be made by Portuguese policy makers and professionals to deliver IY (Incredible Years Training, Sic.) as an early preventive intervention for children displaying early AD/HD behaviours".

Azevedo, A.F., et al. (2013). A Parent-Based Intervention Programme Involving Preschoolers With AD/HD Behaviours: Are Children's and Mothers' Effects Sustained Over Time? European Child and Adolescent Psychiatry. DOI: 10.1007/s00787-013-0470-2. Portugal.

Dyslexia and the Brain

"Here we attempt to disambiguate these influences by using a reading level-matched design, where dyslexic children were contrasted not only with age-matched controls, but also with younger controls who read at the same level as the dyslexics. Consistent with previous reports, dyslexics showed less GMV in multiple left and right hemisphere regions, including left superior temporal sulcus when compared with age-matched controls..."

Dyslexia and the Brain

"...However, not all of these differences emerged when dyslexics were compared with controls matched on reading abilities, with only right precentral gyrus GMV surviving this second analysis. When similar analyses were performed for white matter volume, no regions emerged from both comparisons. These results indicate that the GMV differences in dyslexia reported here and in prior studies are in large part the outcome of experience (e.g., disordered reading experience) compared with controls, with only a fraction of the differences being driven by dyslexia per se" (p. 901).

Krafnick, A.J., et al. (January 14, 2014). An Investigation into the Origin of Anatomical Differences in Dyslexia. <u>Journal of Neuroscience</u>, <u>34</u>(4), 901-908. DOI: 10.1523/JNEUROSCI.2092-13.2013.

Music and Dyslexia

"To better understand this enigma, two groups of musicians were recruited, with and without a history of reading difficulties. The pattern of reading difficulties found among musicians was similar to that reported for non-musician dyslexics, though its magnitude was less severe. In contrast to non-musician dyslexics, their performance in pitch and interval discrimination, synchronous tapping and speech perception tasks, did not differ from the performance of their musician peers, and was superior to that of the general population..."

Music and Dyslexia

"... However, the auditory working memory scores of dyslexic musicians were consistently poor, including memory for rhythm, melody and speech sounds. Moreover, these abilities were inter-correlated, and highly correlated with their reading accuracy. These results point to a discrepancy between their perceptual and working memory skills rather than between sensitivity to speech and non-speech sounds. The results further suggest that in spite of intensive musical training, auditory working memory remains a bottleneck to the reading accuracy of dyslexic musicians"(p. 28).

Weiss, A.H., et al. (February 2014). The enigma of dyslexic musicians. Neuropsychologia, 52, 28-40. DOI:

http://www.ncbi.nlm.nih.gov/pubmed/2436 1476.

Dyslexia & Visuospatial Strength

"This study's findings, which lend empirical support to the hypothesis that people with dyslexia might have certain types of visuospatial processing strengths, are as important as Dr. Pugh's cautions—a richer scientific foundation is needed to know (a) whether these strengths are a consequence of less reading experience and (b) if they translate into a significant real world benefit."

Cowen, C.D. (January, 2014). Dyslexia and Visuospatial Processing Strengths:
New Research Sheds Light. Baltimore, MD: International Dyslexia Association.From website:

http://www.interdys.org/DyslexiaAndVisuospatialProcessing.htm.

Reading, Speech and Math Disabilities

"The present study took an epidemiological approach to study the learning profiles of a large school age sample in language, reading, and math. Both general learning profiles reflecting good or poor performance across measures and specific learning profiles involving either weak language, weak reading, weak math, or weak math and reading were observed. These latter four profiles characterized 70% of children with some evidence of a learning disability. Low scores in phonological short-term memory characterized clusters with a language-based weakness whereas low or variable phonological awareness was associated with the reading (but not language-based) weaknesses. The low math only group did not show these phonological deficits. These findings may suggest different etiologies for language-based deficits in language, reading, and math, reading-related impairments in reading and math, and isolated math disabilities."

Archibald, L.M.D., et al. (October 14, 2013). Language, Reading, and Math Learning Profiles in an Epidemiological Sample of School Age Children. <u>PLOS ONE</u>. DOI: 10.1371/journal.pone.0077463.

Dyslexia, Comprehension and Video Games

"Here, we investigated audiovisual integration using the redundant target effect (RTE) paradigm. Some conditions demonstrating audiovisual integration appear to depend upon magnocellular pathways [6], and dyslexia has been associated with deficits in this pathway [7]; so, we postulated that developmental dyslexics (dyslexics hereafter) would show differences in audiovisual integration compared with controls. Reaction times (RTs) to multisensory stimuli were compared with predictions from Millers race model [8,9]..."

Dyslexia, Comprehension and Video Games

"...Dyslexics showed difficulty shifting their attention between modalities; but such sluggish attention shifting (SAS) [10] appeared only when dyslexics shifted their attention from the visual to the auditory modality. These results suggest that dyslexics distribute their crossmodal attention resources differently from controls, causing different patterns in multisensory responses compared to controls. From this, we propose that dyslexia training programs should take into account the asymmetric shifts of crossmodal attention.

Harrar, V., et al. (February 13, 2014).

Multisensory Integration and Attention in Developmental Dyslexia. <u>Current Biology</u>.

DOI: 10.1016/j.cub.2014.01.029.

Fine Motor Skills and Academics

"The present study examined two separate elements of fine motor skills--visual-motor coordination and visualspatial integration--and their associations with various measures of academic achievement. Visual-motor coordination was measured using tracing tasks, while visual-spatial integration was measured using copy-afigure tasks. After controlling for gender, socioeconomic status, IQ, and visual-motor coordination, and visualspatial integration explained significant variance in children's math and written expression achievement. Knowing that visual-spatial integration skills are associated with these two achievement domains suggests potential avenues for targeted math and writing interventions for children of all ages" (p.514).

Carlson, A.G., et al. (September-December, 2013). Disentangling fine motor skills' relations to academic achievement: the relative contributions of visual-spatial integration and visual-motor coordination.

Journal of Genetic Psychology, 174(5-6), 514-533

CAPD Defined

"Central auditory processing disorders (CAPDs) are breakdowns in the brain's ability to use auditory information sent to it from the peripheral auditory system (e.g., outer, inner, middle ears and the auditory nerve). The central auditory processes identified to date broadly fall into one of three types: auditory discrimination, binaural processing, and temporal processing. Substantial research has indicated that a deficit in any of the central auditory processes can co-exist with or be a significant contributing factor to other functional deficits including learning disabilities, speech-language impairment, attention deficit, or developmental disabilities".

Auditory Discrimination Defined

"Deficits in auditory discrimination are the result of inefficient extraction of the fine acoustic cues in the speech signal. A student who does not "hear" the sounds of speech efficiently will struggle to attach meaning to those sounds".

Binaural Processing Defined

"Deficient binaural processing is characterized by difficulty manipulating and attaching meaning to multiple incoming auditory targets. Reading comprehension, listening comprehension, spelling in context, written language, note-taking and direction following can be adversely affected."

Temporal Processing Defined

"The listener with a temporal processing deficit has difficulty recognizing the perceptual boundaries between/among targets and the acoustic contours (i.e. patterns) in the rapidly occurring speech stream. Students with this deficit may have difficulty in reading, phonological, and spelling skills, direction following, notetaking, sequencing, auditory attention, working memory, and problem-solving."

Ferre, J.M. (February 2014). Auditory
Processing and Common Core. Baltimore,
MD: International Dyslexia Association. From
website:

http://www.interdys.org/DC Jan14 Auditory %20Processing.htm.

Difference Between Male and Female Brains

"Sex differences in human behavior show adaptive complementarity: Males have better motor and spatial abilities, whereas females have superior memory and social cognition skills. Studies also show sex differences in human brains but do not explain this complementarity. In this work, we modeled the structural connectome using diffusion tensor imaging in a sample of 949 youths (aged 8-22 y, 428 males and 521 females) and discovered unique sex differences in brain connectivity during the course of development. Connection-wise statistical analysis, as well as analysis of regional and global network measures, presented a comprehensive description of network characteristics.

Difference Between Male and Female Brains

"...In all supratentorial regions, males had greater withinhemispheric connectivity, as well as enhanced modularity and transitivity, whereas between-hemispheric connectivity and cross-module participation predominated in females. However, this effect was reversed in the cerebellar connections. Analysis of these changes developmentally demonstrated differences in trajectory between males and females mainly in adolescence and in adulthood. Overall, the results suggest that male brains are structured to facilitate connectivity between perception and coordinated action, whereas female brains are designed to facilitate communication between analytical and intuitive processing modes".

Ingalhalikar, M., et al. (December 2, 2013). Sex differences in the structural connectome of the human brain. Procedings of the National Acadmey of Sciences of the United States of America. DOI: 10.1073/pnas.1316909110.

Neurotoxins, SLD, AD/HD,& ASD

"Neurodevelopmental disabilities, including autism, attention-deficit hyperactivity disorder, dyslexia, and other cognitive impairments, affect millions of children worldwide, and some diagnoses seem to be increasing in frequency. Industrial chemicals that injure the developing brain are among the known causes for this rise in prevalence. In 2006, we did a systematic review and identified five industrial chemicals as developmental neurotoxicants: lead, methylmercury, polychlorinated..."

Neurotoxins, SLD, AD/HD,& ASD

"...biphenyls, arsenic, and toluene. Since 2006, epidemiological studies have documented six additional developmental neurotoxicants—manganese, fluoride, chlorpyrifos, dichlorodiphenyltrichloroethane, tetrachloroethylene, and the polybrominated diphenyl ethers. We postulate that even more neurotoxicants remain undiscovered. To control the pandemic of developmental neurotoxicity, we propose a global prevention strategy. Untested chemicals should not be presumed to be safe to brain development, and chemicals in existing use and all new chemicals must therefore be tested for developmental neurotoxicity. To coordinate these efforts and to accelerate translation of science into prevention, we propose the urgent formation of a new international clearinghouse".

Grandjean, P., et al. (March, 2014).

Neurobehavioural effects of developmental toxicity. Lancet Neurology, 13(3), 330-338.

DOI: 10.1016/S1474-4422(13)70278-3.

Medication Treatment for Down's Syndrome?

"Down syndrome (DS) is among the most frequent genetic causes of intellectual disability, and ameliorating this deficit is a major goal in support of people with trisomy 21. The Ts65Dn mouse recapitulates some major brain structural and behavioral phenotypes of DS, including reduced size and cellularity of the cerebellum and learning deficits associated with the hippocampus. We show that a single treatment of newborn mice with the Sonic hedgehog pathway agonist SAG 1.1 (SAG) results in normal cerebellar morphology in adults. Further, SAG treatment at birth rescued phenotypes associated with hippocampal deficits that occur in untreated adult Ts65Dn mice..."

Medication Treatment for Down's Syndrome?

"...This treatment resulted in behavioral improvements and normalized performance in the Morris water maze task for learning and memory. SAG treatment also produced physiological effects and partially rescued both N-methyl-d-aspartate (NMDA) receptor-dependent synaptic plasticity and NMDA/AMPA receptor ratio, physiological measures associated with memory. These outcomes confirm an important role for the hedgehog pathway in cerebellar development and raise the possibility for its direct influence in hippocampal function. The positive results from this approach suggest a possible direction for therapeutic intervention to improve cognitive function for this population".

Das, I., et al. (September 4, 2013). Hedgehog Agonist Therapy Corrects Structural and Cognitive Deficits in a Down Syndrome Mouse Model. Science Translational Medicine. DOI: 10.1126/scitranslmed.3005983.