

***SOCIAL DIFFICULTIES  
OF LEARNING,  
ATTENTIONAL AND  
AUTISTIC DISORDERS:  
SCREENING AND  
TREATMENT***

**Kevin T. Blake, Ph.D., P.L.C.**

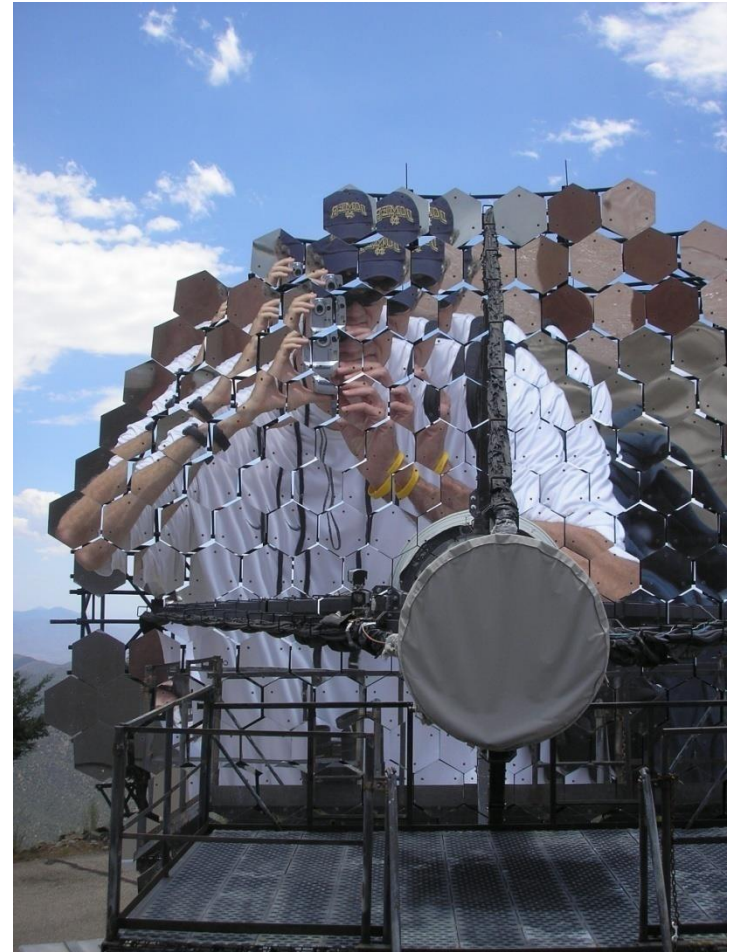
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# *Kevin T. Blake, Ph.D., P.L.C.*

- Licensed Psychologist
- Independent Practice
- Tucson, AZ
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  - University of Arizona  
SALT & DRC
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# *What is “State of the Art”?*



- What you have in your PowerPoint manual may not exactly match mine because something new may have come out since your handouts were printed. Which bike is more “State of the Art”?



# ***Workbook Appendix***

- Extra citations/research (**RESEARCH**)
- Helpful Resources: Books, websites, etc.
- Alternative and Integrative Medicine Treatments for LD, AD/HD, NVLD and Asperger's Disorder
- Central Auditory Processing Disorders (CAPD)
- Hyperacusis: Super sensitive hearing
- Workshop Evaluation and scantron directions



In the effort to comply with the appropriate boards/associations, I declare that I do have affiliations with or financial interest in a commercial organization that could pose a conflict of interest with my presentation.

***SOCIAL DIFFICULTIES OF LEARNING, ATTENTIONAL  
AND AUTISTIC DISORDERS: SCREENING AND  
TREATMENT***

Kevin T. Blake, Ph.D.

owns shares in the following companies:

Amgen, Inc.

Johnson & Johnson, Inc.

Teva Pharmaceutical, ADR.

**Cross Country Education**

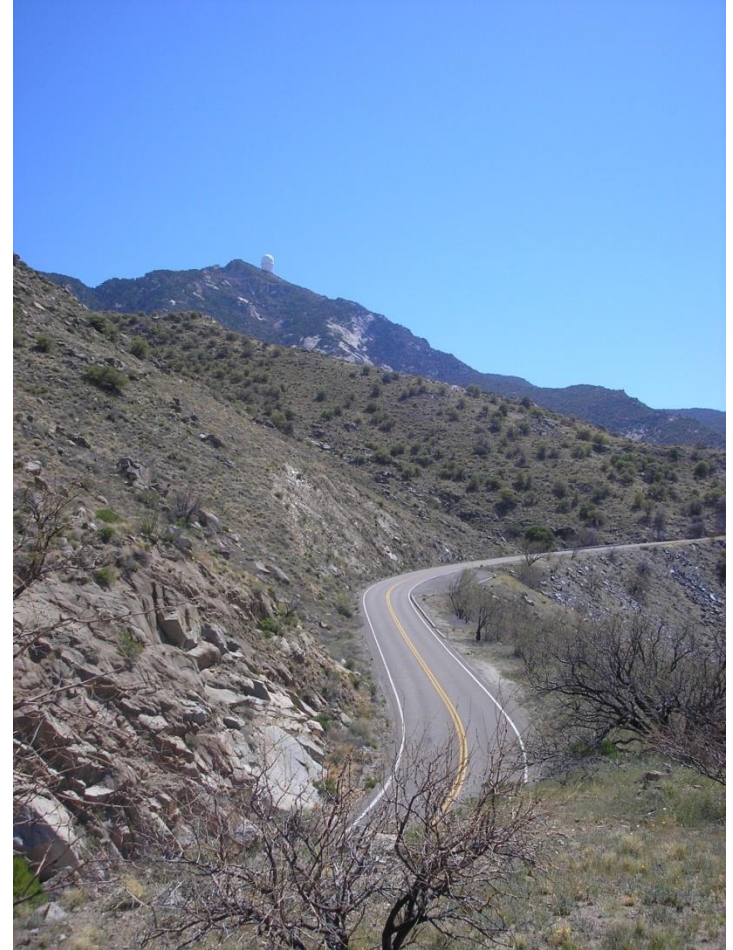
Leading the Way in Professional Development.

[www.CrossCountryEducation.com](http://www.CrossCountryEducation.com)

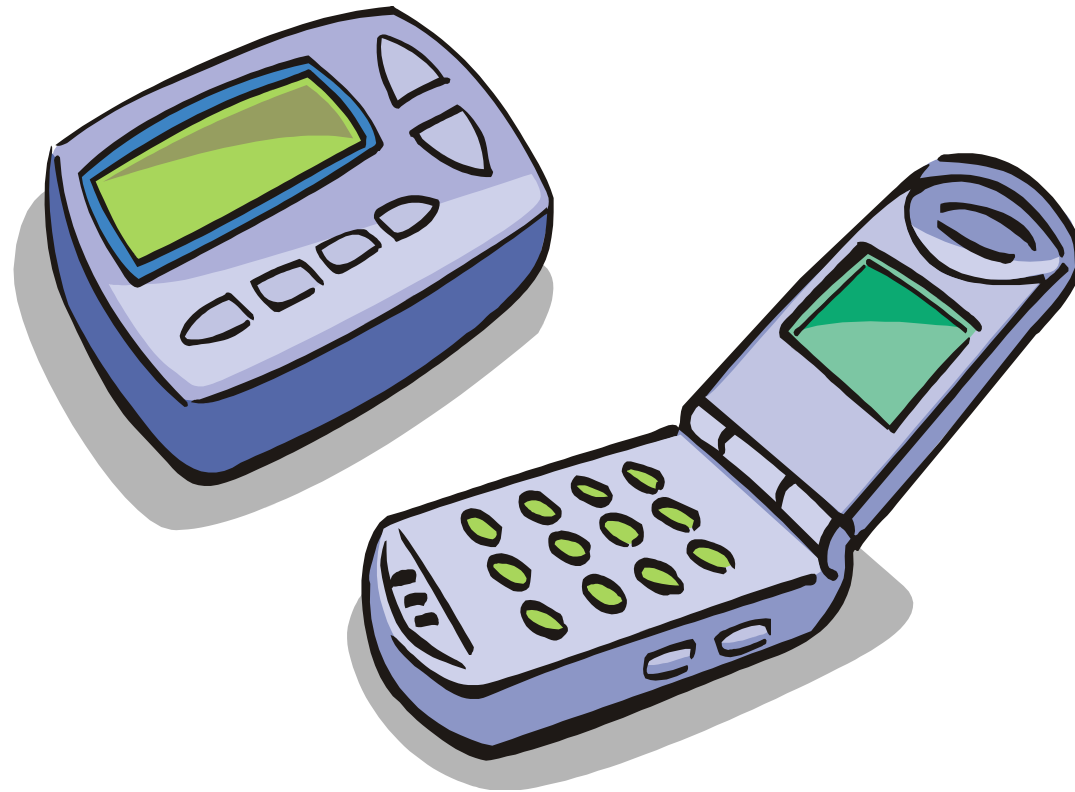
# ***“Road Rules” and What To Expect***

- 9:30 AM to 9:40 AM  
Break
- 11:30 AM to 12:30 PM  
Lunch: On your own
- 2:00 PM to 2:10 PM  
Break
- 3:30 PM Conclusion

***Please hold your questions to the Q & A times after breaks and lunch. I have 368 slides to present.***



# ***PLEASE TURN OFF YOUR CELL PHONES AND PAGERS***



# *Another Group of Professionals that Attend My Workshops*

- ***Thieves!***

- Do not let your valuables out of your sight!
- If you leave your seat take your laptops, cell phones, purses, etc. with you!



# *THE BIG QUESTION?*

- Skill: A behavior that is learned from the environment.
- Ability: A behavior that is biologically encoded in the brain.



# Social Ability

“One of the areas lacking in understanding social competence is the evaluation of social abilities. It is possible that the child can have difficulty in his/her understanding of social interaction, the child’s perception of facial expressions, voice intonation and gestures, his/her ability to remember, organize and retrieve information about social interactions, and/or the social skills themselves.” (p. 40)

Semrud-Clikeman, M. (2007). Social Competence in Children. New York, NY: Springer, p. 40.



# What is a “Disorder”?



- A disorder is a ***harmful dysfunction*** of a naturally selected mechanism.

Wakefield, J.C. (1999). Evolutionary Versus Prototype Analysis of the Concept of Disorder. Journal of Abnormal Psychology, 108 (3), pp. 374-399.

- It must cause a dysfunction in a trait every human develops and create impairment in a major life activity.

Barkley, R.A. (2006). Attention-Deficit Hyperactivity Disorder, Third Edition. New York, NY: Guilford, p. 86, 92-93.

# DSM-5



- DSM-5 is due to be published in 2013.
- Disorder symptoms and cutoffs will be research based for the first time.
- May be “assets based model.”
- Certain symptoms will be weighted more than others.
- Committees met for the first time in 2007.

Goldstein, S. (October 25, 2006). Advanced Treatment (Interventions) For ADHD Across The Lifespan. Paper presented at the CHADD Special Training Day prior to the 18<sup>th</sup> Annual International Conference, Chicago, IL.

Author (2010). DSM-5 Development. Washington, DC: American Psychiatric Association; [www.dsm5.org/Pages/Default.aspx](http://www.dsm5.org/Pages/Default.aspx)

# What is a “Developmental Disorder”?

- A disorder characterized by a significant delay in the rate a normal human trait develops in an individual.
- It takes the individual longer to develop this trait than their age peers.

**Barkley, R.A. (2006). Attention-Deficit Hyperactivity Disorder, Third Edition. New York, NY: Guilford., P. 92-93.**

# What does “Neurobiological” mean?

- Stephen Pinker – “The Blank Slate: The Modern Denial of Human Nature” or better stated, “the Lie of the Blank Slate.”

Pinker, S. (2002). The Blank Slate: The Modern Denial of Human Nature. New York, NY: Viking.

- AD/HD is not caused by child rearing practices or environmental experience.

Barkley, R. A. (2002A-Tape 1). ADHD Symposium: Nature, Diagnosis and Assessment-Nature and Comorbidity and Developmental Course of ADHD. University of Massachusetts, January, Westborough, MA: Stonebridge Seminars.

# What does “Neurobiological” mean?

- 65 to 75% of the cases of Combined Type ADHD are caused by genetic anomalies.
- These people with ADHD are said to have “developmental ADHD.”

Barkley, R.A. (2008). Advances in ADHD: Theory, Diagnosis and Management. J & K Seminars, L.L.C., 1861 Wichersham Lane, Lancaster, PA 17603; 800-801-5415; [www.jkseminars.com](http://www.jkseminars.com).

- 80 to 85% of the variance of those with developmental ADHD is genetic.
- I.Q. is 60 to 65% genetic.

Barkley, R. A. (2002A-Tape 1). ADHD Symposium: Nature, Diagnosis and Assessment-Nature and Comorbidity and Developmental Course of ADHD. University of Massachusetts, January, Westborough, MA: Stonebridge Seminars.



# What does “Neurobiological” mean? (RESEARCH-1)

- Russell Barkley, Ph.D. (2008) said regarding Combined Type ADHD, “You cannot train out this disorder, period!” He went on to state the counselor is a “shepherd” of a disabled person.

Barkley, R.A. (2008). Advances in ADHD: Theory, Diagnosis and Management. J & K Seminars, L.L.C., 1861 Wickersham Lane, Lancaster, PA 17603; 800-801-5415; [www.jkseminars.com](http://www.jkseminars.com).







## *“Acquired ADHD”*

- 25 to 35% of cases of ADHD are acquired/caused by brain trauma
- 15 to 25% of cases of ADHD are acquired/caused by pre-natal and perinatal brain injuries: Maternal smoking/drinking, premature birth, etc.
- 3 to 7% of cases of ADHD are acquired/caused by post- natal brain injuries: head trauma, infections, tumors, lead poisoning, PANDAS, etc.

Barkley, R.A. (2008). Advances in ADHD: Theory, Diagnosis and Management. J & K Seminars, L.L.C., 1861 Wickersham Lane, Lancaster, PA 17603; 800-801-5415; [www.jkseminars.com](http://www.jkseminars.com).



## ***“Acquired” AD/HD***

- Nigg recently found while doing NIH funded research that, “Blood lead levels were significantly higher in children with ADHD, combined type, but this was not the case in children who had ADHD, predominately inattentive type. Nigg and his group believe that high lead levels in the blood might play a role in the hyperactivity component of ADHD, but not the inattentive component of it.” (p. 1 of 2).

Arechart-Treichel, J. (November 2, 2007). Lead in Children’s Blood May Contribute to ADHD’s Hyperactivity Component. Psychiatric News, 42 (21), p. 20. From:  
<http://pn.psychiatronline.org/cgi/content/full/42/21/20-a>.

Nigg, J.T., Kottnerus, G.M., Martel, M.M., Nikolas, M., Cavanagh, K., Karmaus, W. and Rappley, M.D. (2008). High Blood Lead Levels Associated with Clinically Diagnosed Attention-Deficit/Hyperactivity Disorder and Mediated by Weak Cognitive Control. Biological Psychiatry, 63 (3), pp. 325-331.

# ***“Acquired” ADHD***

- Most of those with “acquired” ADHD are males.
- The male brain is more prone to injury and genetic difficulties than the female brain.



Barkley, R.A. (2008). Advances in ADHD: Theory, Diagnosis and Management. J & K Seminars, L.L.C., 1861 Wichersham Lane, Lancaster, PA 17603; 800-801-5415; [www.jkseminars.com](http://www.jkseminars.com).

# What does “Neurobiological” mean?

1. Damage to different neural networks may cause AD/HD symptoms.
2. Differences in Brain Development may cause them, too (more common).
3. AD/HD, “...is a condition of the brain produced by genes.”
4. ADHD has multiple causes

Swanson, J. and Castellanos, X. (1998). Biological Basis of Attention Deficit Hyperactivity Disorder: Neuroanatomy, Genetics, and Pathophysiology. Available from-  
<http://addbalance.com/add/nih/19981118c.htm>.

Biederman, J. (October 27, 2006). Advances in The Neurobiology of AD/HD. Paper presented at the 18<sup>th</sup> Annual CHADD International Conference, Chicago, IL.

Barkley, R.A. (2008). Advances in ADHD: Theory, Diagnosis and Management. J & K Seminars, L.L.C., 1861 Wichersham Lane, Lancaster, PA 17603; 800-801-5415; [www.jkseminars.com](http://www.jkseminars.com).

# ADHD is NOT new!

Crichton wrote  
about what we  
call ADHD in 1798!

Crichton, A. (2008). An inquiry into the nature and origin of mental derangement: On attention and its diseases. Journal of Attention Disorders, 12, 200-204 (Original work published 1798).



# What Does “Neurobiological” Mean?

- Stephen Pinker – “The Blank Slate: The Modern Denial of Human Nature” or better stated, “The Lie of the Blank Slate”.

Pinker, S. (2002). The Blank Slate: The Modern Denial of Human Nature. New York, NY: Viking.

- “Although learning disabilities may be exacerbated by other variables, such as ineffective teaching strategies or socioeconomic barriers, this paper supports the position that the essence of learning disabilities is neurobiological in nature.” (p. 61)

Fiedorowicz, C., et.al. (2001). Neurobiological Basis of Learning Disabilities. Learning Disabilities, 11 (2), pp. 61-74.



# What Does “Neurobiological” Mean?

“Of particular relevance to this review is the compelling evidence in support of the neurobiological basis of learning disabilities. Studies employing widely divergent methodologies, e.g. research using genetic analysis, neuroanatomical neuroimaging, electrophysiological recording, pathological analysis of brain tissue at autopsy, and neuropsychological evaluation have yielded highly convergent conclusions in support of a neurobiological etiology.” (p. 70)

Fiedorowicz, C., et.al. (2001). Neurobiological Basis of Learning Disabilities. Learning Disabilities, 11 (2), pp. 61-74.

# What does “Neurobiological” mean? (**RESEARCH-2**)



60% of Reading Disorder-Dyslexia is genetic.

**Willcutt, E.G. and Gaffney-Brown, R. (Summer, 2004). Etiology of Dyslexia, ADHD and Related Difficulties: Using Genetic Methods to Understand Comorbidity. Perspectives, 30 (3), pp. 12-15.**

# Dyslexia is NOT new!

Sally Shaywitz (2003).  
Reported that Rudolf  
Berlin a physician from  
Stuttgart, Germany  
wrote of “dyslexia” in  
1887.



Shaywitz, S. (2003). Overcoming  
Dyslexia. New York, NY: Knoff.

# What Does Neurobiological Mean?



- “At present, however, the existing data argue strongly for a role of the amygdala and its collaborating cortical systems in the pathobiology of autism spectrum conditions.” (p. 197)

Schultz, R.T., Romanski, L.M. and Tsatsanis, K.D. (2000). Neurofunctional Models of Autistic Disorder and Asperger Syndrome: Clues from Neuroimaging. In A. Klin, F.R. Volkmar and S.S. Sparrow (Eds.), Asperger Syndrome. New York, NY: Guilford, pp. 178-209.

- “The field has come a long way since parents were considered to be the cause of autism spectrum disorders.” (p. 64)

Ozonoff, S., Dawson, G. and McPartland, J. (2002). A Parent’s Guide to Asperger Syndrome & High Functioning Autism. New York, NY, Guilford.

# Genes & Asperger's Disorder

## (RESEARCH-3 & 4)

“My colleagues and I recently published the first candidate gene study of Asperger's syndrome, which identified 14 genes associated with the condition.”  
(Baron-Cohen, November 11, 2009)

Baron-Cohen, S. (November 11, 2009). The short life of a diagnosis. The New York Times, From website: [www.autismresearchcentre.com/arc/default.asp](http://www.autismresearchcentre.com/arc/default.asp)

The mitochondrial DNA A3243A>G mutation must be an infrequent cause of Asperger syndrome. Journal of Pediatrics, From website: [www.autismresearchcentre.com/docs/papers/2006\\_Chinnery\\_etal.pdf](http://www.autismresearchcentre.com/docs/papers/2006_Chinnery_etal.pdf), p. 280-281e (letters).



# “Dr. Andrew Wakefield struck off medical register”

“Andrew Wakefield, the doctor who triggered the MMR vaccine scare has been struck off the medical register...Dr. Wakefield has been found guilty of serious professional misconduct over “unethical” research that sparked unfounded fears that the vaccine was linked to bowel disease and autism...The panel is profoundly concerned that Dr. Wakefield repeatedly breached fundamental principles of research medicine...Immunization rates fell, leading to a resurgence of potentially deadly measles cases in recent years. The Lancet, which had withdrawn contested parts of the paper in 2004, subsequently retracted in full.”

Sanchez, R. and Rose, D. (May 25, 2010). Dr. Andrew Wakefield struck off medical register. Timesonline, [www.timesonline.co.uk/to/news/uk/article7134893.ece](http://www.timesonline.co.uk/to/news/uk/article7134893.ece).



# Centers for Disease Control and Prevention

- “Autism is known to be a genetic disorder, at least in part.” (p. 2 of 3)

Author (No Date). Fact Sheet: Study to Explore Early Development (SEED). Center for Disease Control and Prevention. From website:

<http://www.cdc.gov/ncbddd/autism/states/new/CADDRE%20Fact%20Sheet%20July%20202007.pdf>.

- **Centers for Autism and Developmental Disabilities Research and Epidemiology (CADDRE) Network:** “The CADDRE Network is currently working on the Study to Explore Early Development ([SEED](#)) – a five-year, multi-site collaborative study to help identify factors that may put children at risk for autism spectrum disorders (ASDs).”

Centers for Disease Control and Prevention, Autism Information Center, Centers for Autism and Developmental Disabilities Research and Epidemiology. From website:

<http://www.cdc.gov/ncbddd/autism/caddre.htm>.

# *Autism is **NOT** New!*

“People have probably lived with what we know today as autism spectrum disorders throughout history. Some of the earliest published descriptions of behavior that sounds like autism date back to the 18th century. But the disorder did not have a name until the middle of the 20th century.”

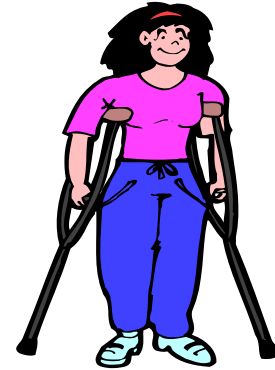
Centers for Disease Control and Prevention. Autism Information Center.  
<http://www.cdc.gov/ncbddd/autism/overview.htm#is>

# ***ASD's Prevalence***

“CDC estimates that an average of 1 in 110 children in the U.S. have an ASD.”

Centers for Disease Control and Prevention (No Date). Autism Spectrum Disorders. National Center Home Page, National Center of Birth Defects and Developmental Disabilities, Division of Birth Defects and Developmental Disabilities, [www.cdc.gov/ncbddd/autism/index.html](http://www.cdc.gov/ncbddd/autism/index.html).

# What is a “Disability?”



- With adults the term disability has become a legal term of art since the passage of the American's with Disability Act (ADA).
- One must be impaired compared to the Average American.
- Highly Controversial

Gordon, M. and Keiser, S. (Eds.) (1998). Accommodations in Higher Education Under the Americans with Disabilities Act: A No-Nonsense Guide for Clinicians, Educators, Administrators, and Lawyers. New York, NY: Guilford.

# Americans with Disabilities Act, Amendment Act of 2008

The new act makes it easier for a person to establish they have a disability. It directed the U.S. Equal Opportunity Employment Commission to redefine the term “substantially limits.” The list of “major life activities” was expanded to include reading, bending, walking, communicating, etc. The bill included bodily functions like difficulties with the immune system, bowel functions, etc. If a person has 20/20 vision while wearing glasses they are now still considered disabled. People with “episodic disabilities” are now better protected.

**Equal Opportunity Employment Commission:**

[www.eeoc.gov/laws/statutes/adaaa\\_notice.cfm](http://www.eeoc.gov/laws/statutes/adaaa_notice.cfm).



# Ways Social Interactions Influence Physical Health

- Social Support: Stress Buffering-Reduces the stressful event by promoting less threatening interpretation of the event.
- Social Integration: Main Effect-Promotes positive psychological states, social motivation and pressure to care for oneself.
- Negative Interactions: Relationships as a Source of Stress-Elicits psychological stress and increases risk for disease.

Cohen, S. (November, 2004). Social Relationships and Health. American Psychologist, 59 (8), pp. 676-674.

# What is Social Competence?

“Social competence is an ability to take another’s perspective concerning a situation and to learn from past experience and apply that learning to the ever-changing social landscape. The ability to respond flexibly and appropriately defines a person’s ability to handle the social changes that are presented to us all.” (p. 1-2)

**Semrud-Clikeman, M. (2007). Social Competence in Children. New York, NY: Springer, pp. 1-2.**

# Social Competence and Health

**“There is sufficient empirical evidence that links social competence to mental and physical health...It has been linked to such varied disorders as anxiety, cardiovascular disease, juvenile delinquency, and substance abuse, to name a few.” (p. 1)**

**Semrud-Clikeman, M. (2007). Social Competence in Children. New York, NY: Springer.**



# Skills of Social Emotional Competence

- Awareness of own emotional state
- Awareness of other's emotional state
- Emotional use of words
- Ability to cope with emotional distress
- Ability to attend to the reaction of others

**Semrud-Clikeman, M. (Spring, 2003). Executive Function and Social Communication Disorders. Perspectives, 29 (2), p. 20-22.**

**Semrud-Clikeman, M. (2007). Social Competence in Children. New York, NY: Springer.**

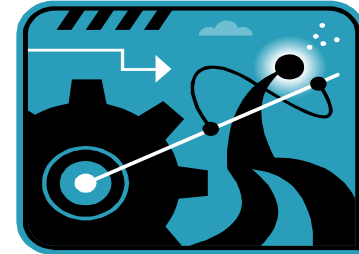
# Learning Disorders and Social Skills

“Reviews of the literature indicate that approximately 75% of the children with learning disabilities also experience problems with social skills.” (p. 76)



**Semrud-Clikeman, M. (2007). Social Competence in Children. New York, NY: Springer, p. 76.**

# Learning Disorders, Social Skills & Work

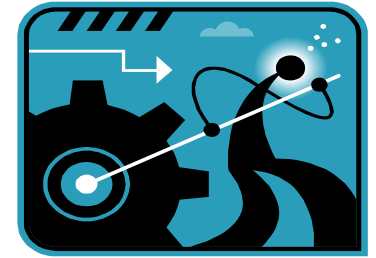


- “...social skills deficits can be the most debilitating part of the learning-disabled experience.” (p. 201)
- “Failure at ‘office politics’ can lead to being fired. Many people with learning disabilities, at high or low levels, reach a plateau and are unable to advance for reasons of personal matching.” (p. 201)
- Poor social skills are the reason for under-employment in many with LD.

**Brown, D.S. and Gerber, P.J. (1994). Employing People with Learning Disabilities. In P.J. Gerber and H. B. Reiff (Eds.), Learning Disabilities in Adulthood: Persisting Problems and Evolving Issues. Austin, TX: Pro-Ed, pp. 194-203.**

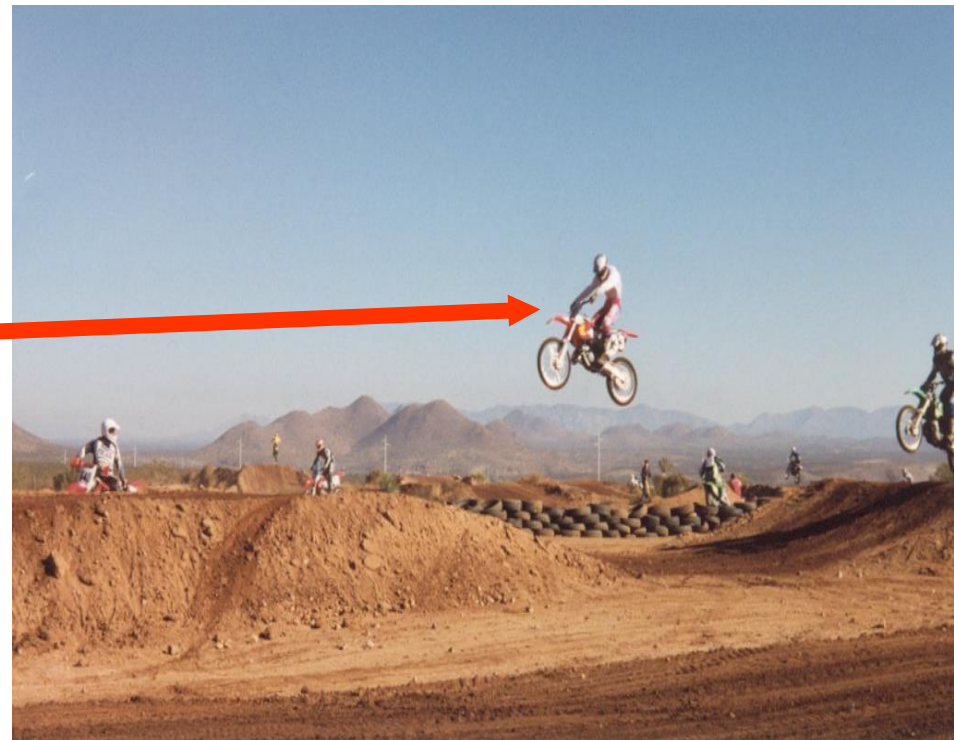
**McLoughlin, D., Fitzgibbon, G. and Young, V. (1994). The Adult Dyslexic: Assessment, Counseling and Training. San Diego, CA: Singular.**

# ADHD and Employment

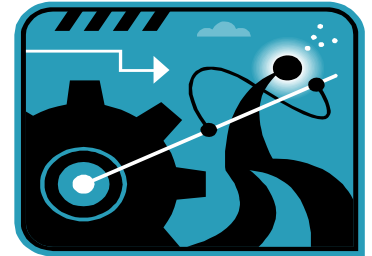


- 80% of AD/HD children suffer social rejection by second grade.
- Impulsivity?

Barkley, R.A. (2008). Advances in ADHD: Theory, Diagnosis and Management. J & K Seminars, L.L.C., 1861 Wickersham Lane, Lancaster, PA 17603; 800-801-5415; [www.jkseminars.com](http://www.jkseminars.com).

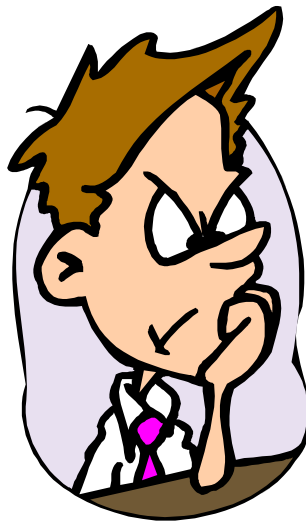


# ADHD and Employment



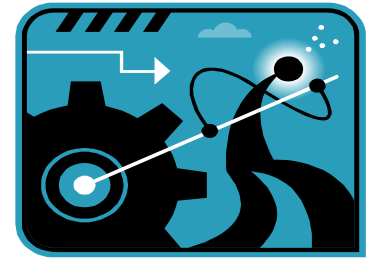
- Difficulty with others is one of the main reasons AD/HD adults loose their jobs.

..



**Ratey, N. and Griffith-Haynie, M. (1998). Coaching to Improve Workplace Performance. Paper presented at the Fourth Annual ADDA Adult ADD Conference, March 26-28, Washington, DC.**

# AD/HD and Employment (RESEARCH)



- One-half of AD/HD adults are unemployed

Biederman, J. (October 27, 2006).  
Advances in The Neurobiology of AD/HD. Paper presented at the 18<sup>th</sup> Annual CHADD International Conference, Chicago, IL.



# Social Disorders



- AD/HD Combined Type men married less, reported interpersonal and sexual problems, had general difficulties with socialization, difficulties with heterosocial responses and problems with assertiveness (Weiss and Hechtman, 1993)
- Those with AD/HD often have problems with emotional regulation. This causes problems, too.

**Weiss, G. and Hechtman, L.T. (1993). Hyperactive Children Grown Up (Second Edition). New York, NY:Guilford.**

**Canu, W.H. and Carlson, C.L. (April, 2004). ADHD and Social Adaptation From Childhood to Adulthood. ADHD Report, 12 (2), pp. 1-6.**

# Social Disorders



- Men with Inattentive AD/HD were rated more negatively by women than men with Combined Type AD/HD and those without AD/HD as potential dates.
  - AD/HD, PI men are less talkative, less assertive started dating later.
  - Less desire to continue interaction by women

Canu, W.H. and Carlson, C.L. (April, 2004). ADHD and Social Adaptation From Childhood to Adulthood. ADHD Report, 12 (2), pp. 1-6.



# Social Disorders



- Regarding Nonverbal LD Ozonoff, et.al. (2002) wrote, “Many children with NLD have trouble reading the emotions of others and have other social difficulties...” (p. 162)

Ozonoff, S., Dawson, G. and McPartland, J. (2002). A Parent's Guide to Asperger Syndrome & High Functioning Autism. New York, NY: Guilford.

# ***Learning Disorders***

- Rourke broke down Learning Disorders into two groups:
  1. Basic Phonological Processing Disorders
  2. Nonverbal Learning Disorders

**Rourke, B.P. (2006). Question #1: You refer to NLD as a subtype of Learning Disabilities (LD). How do you define LD? From Website: [www.nld-bprouke.ca/BPRA1.html](http://www.nld-bprouke.ca/BPRA1.html)**

# Nonverbal Learning Disorders (NVLD)

- Five to ten percent of the LD population has NVLD.
- Sixty percent of those with NVLD have comorbid AD/HD
- “Social Competence Disorder”

**Semrud-Clikeman, M. (October 26, 2006). AD/HD and Co-morbidity: Aspergers, Autism Spectrum and Nonverbal Learning Disabilities. Paper presented at the Pre-Conference Institutes of the 18<sup>th</sup> Annual CHADD International Conference, Chicago, IL.**

# *Autism Spectrum Disorders*



- “The Core Problem with autism is their social disability.”  
(Klin, 2001)

**Klin, A. (2001). Autism, Asperger’s and the PDD Spectrum. Seminar presented at the 33<sup>rd</sup> Annual Arizona Association of School Psychologists Conference, “Across the Spectrum”, October 11 and 12, 2001, Mesa, AZ.**

# Autism Spectrum Disorders



- Klin and Volkmar said of adults with Asperger's Disorder, "Unless issues of social presentation and competence are adequately addressed, including what to do in specific situations such as lunch or free-time periods, the chances of vocational satisfaction are lessened." (p. 351)

Klin, A. and Volkmar, F.R. (2000). Treatment and Intervention Guidelines for Individuals with Asperger Syndrome. In A. Klin, F. Volkmar and S.S. Sparrow (Eds.), Asperger Syndrome. New York, NY: Guilford, pp. 340-366.

# Social Interaction



“...traditional psychologists and neurologists have been slow to acknowledge that social behavior is at least in part a brain function just like memory or language.” (p. 296)

**Ratey, J.J. (2001). A User's Guide to the Brain: Perception, Attention and the Four Theaters of the Brain. New York, NY: Vintage.**

# Neurosocial Disorder



- Rosen and Bartak broke down social interaction into three parts (which are intertwined):
  - ◆ **Social Perception**: The ability to perceive social interactions.
  - ◆ **Social Interpretation**: How we understand social interaction after it is perceived.
  - ◆ **Social Skills**: Emotional, cognitive, verbal and nonverbal ways we socially behave.

Rosen, W. and Bartak, J. (2002). Distinguishing Features of Social Deficits in Children with Neurobiological Disorders. Learning Disabilities Association International Conference, January 15, Denver, CO.

# Neurosocial Disorder



- Many of us are so well wired to pick up proper social behavior intuitively, we have overlooked those who don't and need explicit training in social interactions and have viewed them as just misbehaving.
- **“Neurosocial Disorders”** = “Social Learning Disabilities”

Rosen, W. and Bartak, J. (2002). Distinguishing Features of Social Deficits in Children with Neurobiological Disorders. Learning Disabilities Association International Conference, January 15, Denver, CO.



# Neurosocial Disorder



- With Neurosocial Disorders you must match etiology to treatment.

Rosen, W. and Bartak, J. (2002). Distinguishing Features of Social Deficits in Children with Neurobiological Disorders. Learning Disabilities Association International Conference, January 15, Denver, CO.

# Neurosocial Disorder

- When treating such disorders you want to start treatment where the breakdown occurs.
  - Encoding
  - Representation
  - Generating Responses
  - Decision Making



Semrud-Clikeman, M. (October 26, 2006). AD/HD and Co-morbidity: Aspergers, Autism Spectrum and Nonverbal Learning Disabilities. Paper presented at the Pre-Conference Institutes of the 18<sup>th</sup> Annual CHADD International Conference, Chicago, IL.

Semrud-Clikeman, M. (2007). Social Competence in Children. New York, NY: Springer.

# Subtypes of Social Difficulties

1. AD/HD typically associated with Oppositional Defiant Disorder or Conduct Disorder
2. Autism Spectrum/Asperger's Disorder/NVLD
3. AD/HD only

**Voeller, K.S. (1994). Techniques for Measuring Social Competence in Children. In R.G. Lyon (Ed.), Frames of Reference for the Assessment of Learning Disabilities: New Views on Measurement Issues. Baltimore, MD: Paul H. Brookes, pp. 523-554.**

# DSM-5 Digression



- Types of ADHD:
  1. AD/HD (Combined Type)
  2. AD/HD, Not Otherwise Specified
  3. AD/HD + Conduct Disorder, Callous and Unemotional Specifier
  4. Sluggish Cognitive Tempo/Attention Deficit Disorder

Author (2010). ADHD and Disruptive Behavior Disorders. Washington, DC: American Psychiatric Association; [www.dsm5.org/meetus/pages/adhd.aspx](http://www.dsm5.org/meetus/pages/adhd.aspx).

Author (February 2, 2010). DSM-5: Options Being Considered for ADHD. Washington, DC: American Psychiatric Association;  
[www.dsm5.org/Proposed%20Revision%20Attachments/APA%20Options%20for%20ADHD.pdf](http://www.dsm5.org/Proposed%20Revision%20Attachments/APA%20Options%20for%20ADHD.pdf).

Barkley, R.A. (2008). Advances in ADHD: Theory, Diagnosis and Management. J & K Seminars, L.L.C., 1861 Wichersham Lane, Lancaster, PA 17603; 800-801-5415; [www.jkseminars.com](http://www.jkseminars.com).

# DSM-5 Digression



## 5. Temper Dysregulation Disorder with Dysphoria and Comorbid AD/HD

Author (February 14-16, 2007). Externalizing Disorders of Childhood (Attention-deficit/Hyperactivity Disorder, Conduct Disorder, Oppositional-defiant Disorder, Juvenile Bipolar Disorder. Washington, DC: American psychiatric Association; [www.dsm5.org/research/pages/externalizingdisordersofchildhood\(attention-deficithyperactivitydisorder,conductdisorder,oppositional-defiantdisorder,juven.aspx](http://www.dsm5.org/research/pages/externalizingdisordersofchildhood(attention-deficithyperactivitydisorder,conductdisorder,oppositional-defiantdisorder,juven.aspx).

Author (2010). Justification for Temper Dysregulation Disorder with Dysphoria. Washington, DC: American Psychiatric Association; [www.dsm5.org/Proposed%20Revision%20Attachments/Justification%20for%20Temper%20dysregulation%20Disorder%20with%20dysphoria.pdf](http://www.dsm5.org/Proposed%20Revision%20Attachments/Justification%20for%20Temper%20dysregulation%20Disorder%20with%20dysphoria.pdf).

Barkley, R.A. (2008). Advances in ADHD: Theory, Diagnosis and Management. J & K Seminars, L.L.C., 1861 Wichersham Lane, Lancaster, PA 17603; 800-801-5415; [www.jkseminars.com](http://www.jkseminars.com).

# DSM-5 Digression



- Types of High Functioning Autism, Autism, Nonverbal LD, Asperger's Disorder, PDD, PDD, NOS:

## 1. Autism Spectrum Disorder

Author (2010). Asperger's Disorder. Washington, DC: American Psychiatric Association;

[www.dsm5.org/Proposed/Revisions/Pages/proposedrevision.apx?rid=97#](http://www.dsm5.org/Proposed/Revisions/Pages/proposedrevision.apx?rid=97#).

Author (2010). Autistic Disorder. Washington, DC: American Psychiatric Association;

[www.dsm5.org/Proposed/Revisions/Pages/proposedresisions.apsx?rid=94](http://www.dsm5.org/Proposed/Revisions/Pages/proposedresisions.apsx?rid=94).

# Social Learning Disabilities



- LD children are less socially competent and less well liked.
- Typical social cognitive problems:
  - ◆ Interpretation and perception of faces, tone of voice, gesture and body language
  - ◆ Poor at social inference and poor social judgment

Wren, C. (2000). Hanging By A Twig. New York, NY: Norton.

Semrud-Clikeman, M. (2007). Social Competence in Children. New York, NY: Springer, pp. 76-77.

# DSM-5 Digression



- Types of Learning Disorders:

1. Dyslexia

2. Dyscalculia

Author (2010). Reading Disorder. Washington, DC: American Psychiatric Association;  
[www.dsm5.org/ProposedRevisions/Pages/proposedrevision.aspx?rid=84#](http://www.dsm5.org/ProposedRevisions/Pages/proposedrevision.aspx?rid=84#).

Author (2010). Mathematics Disorder. Washington, DC: American Psychiatric Association;  
[www.dsm5.org/ProposedRevisions/Pages/proposedrevision.aspx?rid=85#](http://www.dsm5.org/ProposedRevisions/Pages/proposedrevision.aspx?rid=85#).



# Brain Areas Related to Social Interaction

Schultz and Klin (in press) indicated the following brain areas control the following social behaviors:

**Frontal lobe**: Theory of mind and social perception

**Hypothalamus**: Maternal behavior

**Amygdala**: Arousal, emotional learning, social orienting, recognition of emotional significance

**Fusiform gyrus**: Face perception

**Temporal lobe**: Interpretation of biological movement, recognition of facial expressions



Schultz, R.T. & Klin, A. (in press). Social Systems of the Brain: Evidence From Autism and Related Disorders. Philosophical Transactions of the Royal Society, Series B. (taken from: Ozonoff, S., Dawson, G. and McPartland, J. 2002. A Parent's Guide to Asperger Syndrome & High-Functioning Autism. New York, NY: Guilford, p. 58)

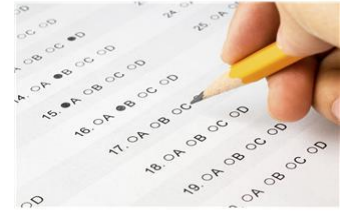
# Brain Areas Related to Social Interaction



- Voeller believed all the above mentioned systems are located in their own specific brain areas.
- Impairment in one area does not necessarily mean impairment in other areas.

**Voeller, K.S. (1995). Clinical Neurological Aspects of the Right-Hemisphere Deficit Syndrome. Journal of Child Neurology, 10 (Supplement Number 1), pp. S16-S22.**

# *Emotional Intelligence*



- Lane wrote, “Emotional Intelligence may be broadly defined as the ability to use emotional information in a constructive and adaptive manner.” (p. 2)

**Lane, R.L. (2000). Neural Correlates of Conscious Emotional Experience. In R. Lane, L. Nadel, G. Ahern, J. Allen, A. Kazniak, S. Rapcsak and G. Schwartz (Eds.), Cognitive Neuroscience of Emotion. New York, NY: Oxford University Press, pp. 345-370.**

# *Emotional Intelligence*

- Daniel Goleman stated that emotional intelligence is intricately imbedded in the human neuroanatomy.

**Goleman, D. (1997). Emotional Intelligence: Why It Can Matter More Than IQ. New York, NY: Bantam.**



# *Emotional Intelligence*

- A prerequisite for empathy is an awareness of one's own emotions.

**Lane, R.L. (2000). Neural Correlates of Conscious Emotional Experience. In R. L. Lane, L. Nadel, G. Ahern, J. Allen, A. Kazniak, S. Rapcsak and G. Schwartz (Eds.), Cognitive Neuroscience of Emotion. New York, NY: Oxford University Press, pp. 345-370.**



# *Emotional Intelligence*



- AD/HD Children live a lifetime of social rejection.
- Around 80% of Combined Type ADHD children are socially rejected because of poor social skills by 2<sup>nd</sup> grade.
- AD/HD children often are not aware of their poor social skills and blame others for their problems.

**Barkley, R.A. (2008). Advances in ADHD: Theory, Diagnosis and Management. J & K Seminars, L.L.C., 1861 Wickersham Lane, Lancaster, PA 17603; 800-801-5415; [www.jkseminars.com](http://www.jkseminars.com).**

# *Emotional Intelligence*

- Daniel Goleman stated that emotional intelligence is intricately imbedded in the human neuroanatomy.

**Goleman, D. (1997). Emotional Intelligence: Why It Can Matter More Than IQ. New York, NY: Bantam.**



# Simon Baron-Cohen and Emotional Intelligence



- Autism may be an extreme form of the biological male personality.
- Males are into ***Systematizing (S)***, or understanding things.
- Females are into ***Empathizing (E)***, or understanding people.
- Those with Autism (mostly males) have no ***Empathizing***, but are strong in ***Systematizing***.
- The ***E-S Spectrum***

Baron-Cohen, S. (2003). The Essential Difference. New York, NY: Perseus.



# Dyslexia and Gender



- Sally Shaywitz (1996) reported:
  - ◆ Women's brains appear to have bilateral phonological processing.
  - ◆ This may explain why women tend to have fewer language deficits after left brain strokes.
  - ◆ It may also explain why more women than men compensate for dyslexia.

**Shaywitz, S.E. (1996). Dyslexia. Scientific American, 275 (5), pp. 98-104.**

# *AD/HD and Gender*



- Quinn and Nadeau (2002) believe there should be separate female symptoms and criteria for AD/HD.
- Goldstein and Gordon (2003) say there is no research to justify this.
- ***However, AD/HD girls suffer socially more than AD/HD boys.***

Quinn, P. O. and Nadeau, K.G. (2002). Gender Issues and AD/HD. Silver Spring, MD: Advantage.

Goldstein, S. and Gordon, M. (August, 2003). Gender Issues and ADHD: Sorting Fact From Fiction. ADHD Report, 11 (4), 7-11, 16.

Langer, H. (2002). Role Expectations. In P.O. Quinn and K.G. Nadeau (Eds.), Gender Issues and AD/HD. Silver Spring, MD: Advantage, pp. 70-80.

# *Asperger's and Gender*



- Girls and women with Asperger's Disorder suffer more socially than boys and men with Asperger's Disorder.

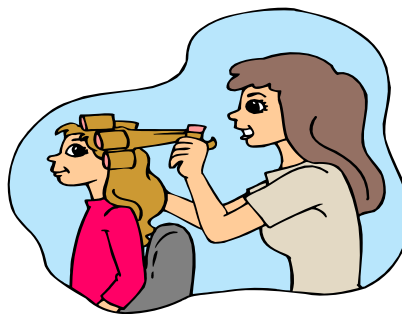
Attwood, T. (2007). The Complete Guide for Asperger's Disorder. Philadelphia, PA: Jessica Kingsley.

Hully, C. and Larmar, S.A. (2006). Asperger Syndrome in Adolescent Females.

International Journal of Learning. 13 (3), p. 1-6. From Website:

<http://www98.griffith.edu.au/dspace/bitstream/10072/14167/1/40458.pdf>.

# Compassion



- Three things make humans behaviorally different from all other species:
  - Our capacity to delay our response to our environment (Bronowski, 1977).
  - Our capacity for compassion (Leakey, 1995).
  - Our capacity for long-term compassion (Grandin, 1995).

Bronowski, J. (1977). Human and Animal Languages: In a Sense of Future. Cambridge, MA: MIT Press. pp. 104-131.

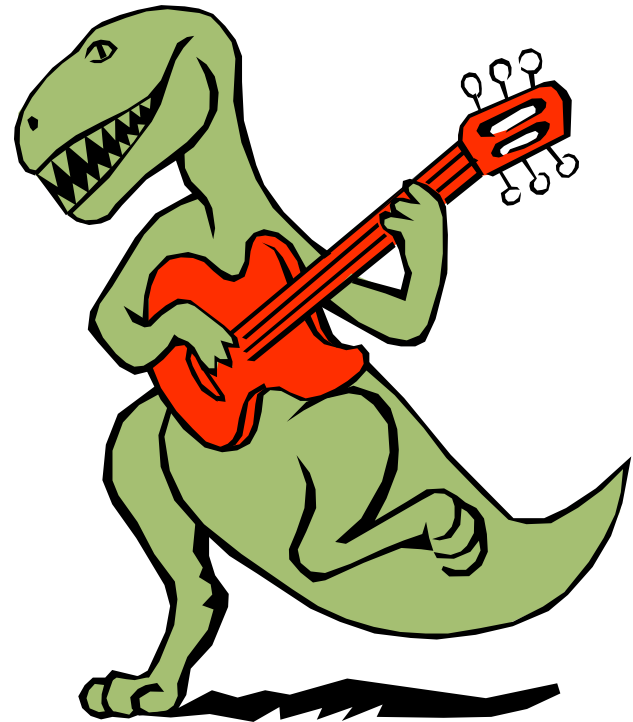
Leakey, R. (1995). Speech given to the National Press Club, Washington, DC, Played on National Public Radio.

Grandin, T. (1995). Thinking In Pictures: And Other Reports From My Life With Autism. New York, NY: Vintage.

# *Kinder, Gentler, T-Rex*

- There is now evidence that some dinosaurs nested and raised offspring similar to modern birds. Hence, they had some capacity for compassion.

Horner, J. (2000). Dinosaur Reproduction and Parenting. Annual Review of Earth and Planetary Sciences, 28, p. 19-45.



# Compassion



“The findings command attention, as the bonobo is just as close to us as its sibling species, the chimpanzee. According to DNA analysis, we share over 98 percent of our genetic with each of these two apes...the genetic makeup of a chimpanzee or bonobo matches ours more closely than any other animal...In terms of family resemblance, only two options exist: either we are one of them or they one of us.” (p. 5)

DeWaal, F., and Lanting, F. (1997). Bonobo: The Forgotten Ape. Berkley, CA: University of California Press, p. 5.

# Compassion

“In the summer of 1982 Kat was newly pregnant, and Washoe doted over her belly, asking about her BABY. Unfortunately, Kat suffered a miscarriage. Knowing that Washoe had lost two of her own children, Kat decided to tell her the truth. MY BABY DIED, Kat signed to her. Washoe looked down to the ground. Then she looked into Kat’s eyes and signed CRY, touching her cheek just below the eye. When Kat had to leave that day, Washoe would not let her go. PLEASE PERSON HUG, she signed.” (Fouts, 1997; Edwards, 2000)

Fouts, R. (1997). Next of Kin: My Conversations with Chimpanzees.

New York, NY: William Morrow.

Edwards, M. (Spring, 2000). Book Review. The Harvard Brain. From website:

[hcs.harvard.edu/~husn/BRAIN/vol7-spring2000/fouts.htm](http://hcs.harvard.edu/~husn/BRAIN/vol7-spring2000/fouts.htm).



# Compassion



- Bonobo: *Pan paniscus*
  - Shares 98% of its genetic profile with humans.
  - They have been compared to australopithecines
  - “In physique, a bonobo is as different from a chimpanzee as a Concorde is from a Boeing 747.”  
(p. 3 of 14)

DeWaal, F.B.M. (March 1995). Bonobo Sex and Society. Scientific American. pp. 82-88.  
From Website: <http://primates.combonobos/bonobosexsoc.html>.



# Compassion



- The dominate male bonobo at the Great Ape Trust in Iowa, Kanzi, can communicate by using 348 symbols and knows the meaning of up to 3000 words!

Raffaele, P. (November, 2006). The Smart and Swinging Bonobo. Scientific American. 37 (6), pp. 66-75.

# Bonobos & Vasopressin



“Interestingly, this same polymorphic microsatellite in the human *AVPR1A* that has been associated in autism is absent in the common chimpanzee, but present in the bonobo. Bonobos are known for high levels of psychosexual reciprocity and they appear to use sexuality to promote social reconciliation as well as social bonding within the group. Therefore, it is intriguing to consider that as in voles, variations in unstable microsatellite sequences in the promoters of the primate vasopressin receptor may contribute to species difference in expression and social behaviour, as well as to individual differences in social behaviour.” (p. 2195)

Hammock, E.A.D. and Young, L.J. (December, 2006). Oxytocin, Vasopressin and Pair Bonding: Implications for Autism. Philosophical Transactions of the Royal Society of Biological Sciences, 361 (1476), pp. 2187-2198. From Website: <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1764849>.

# *Chimpanzee, Bonobos, Humans & Vasopressin*



“Similar genetic variation in the human *AVPR1A* may contribute to variations in human social behavior including extremes outside the normal range of behavior and those found in autism spectrum disorders.” (p. 2187)

Hammock, E.A.D. and Young, L.J. (December, 2006). Oxytocin, Vasopressin and Pair Bonding: Implications for Autism. Philosophical Transactions of the Royal Society of Biological Sciences, 361 (1476), pp. 2187-2198. From Website:  
<http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1764849>

# *Chimpanzee, Bonobos, Humans & Vasopressin*



“Our two closest primate cousins – chimpanzees and bonobos –also have different lengths of this gene, which match their social behaviors. Chimpanzees, who have the shorter gene, live in territorially based societies controlled by males who make frequent, fatal war raids on neighboring troupes. Bonobos are run by female hierarchies and seal every interaction with a bit of sexual rubbing...”

# *Chimpanzee, Bonobos, Humans & Vasopressin*



“...They are exceptionally social and have a long version of the gene. The human version of the gene is more like the bonobo gene. It would seem that those with the longer version of the gene are more socially responsive. For example, this gene is shorter in humans with autism...” (p. 74)

**Brizendine, L. (2006). The Female Brain. New York, NY: Morgan Road.**



# *Alexithymia*



# What is Alexithymia?



1. Tend not to have fantasies, no feelings, and have sharply limited emotional vocabularies.
2. They have colorless dreams.
3. They cannot tell bodily sensations from emotions and are baffled by them.
4. They have great difficulty making decisions because they lack “gut feelings.”

**Goleman, D. (1995). Emotional Intelligence: Why It Can Matter More Than I.Q. New York, NY: Bantam.**

# *Alexithymia*

- “Functional imaging studies implicate medial and prefrontal cortex and posterior superior sulcus (STS)...(sic. The) STS is concerned with representing the actions of others through the detection of biological motion; medial prefrontal regions are concerned with explicit representation of the states of the self. These observations suggest that the ability to mentalize has evolved from a system for representing actions.”

Frith, C.D. and Frith, U. (1999). Intersecting Minds-A Biological Basis. Science, 286, 1692-1695.



# Alexithymia

Lane wrote, “Several neuroimaging studies reveal that an area of the medial prefrontal cortex very close to that identified in our attention to emotional experience study has been implicated during the performance of theory of mind tasks...these findings suggest that the neural substrates of the mental representation of one’s own and other’s mental states are closely related.” (p. 18) Lane continued that several studies of brain injured individuals when coupled with the above appeared to indicate, “...*that successful social adaptation requires the ‘dual task’ ability to stay in touch with the needs of others while paying due attention to one’s own needs.*” (p. 20)

Lane, R. (2000). Neural Correlates of Conscious Emotional Experience. In L.R. Lane, et. al. (Eds.), Cognitive Neuroscience of Emotion. New York, NY: Oxford University Press, pp. 345-370.

# ***Macaque Monkey***



Macaques from:

Researchers discovered “mirror neurons” at the University of Parma in Italy in 1992.

Rizzolatti, G., Fogassi, L. and Gallese, V. (November, 2006). Mirrors in The Mind.

Scientific American, 296 (5), pp. 54-61.

# Mirror Neurons



- Italian study of macaque monkeys in 1992
  - Known for years cells of premotor cortex fire just before movement.
  - Discovered the same cells fired in the same pattern when another primate was seen making the same movement!
  - Humans have these **MIRROR NEURONS** too.
  - They allow us to intuit others intentions and to feel their pain.

Lametti, D. (June 9, 2009). Mirroring Behavior. Scientific American, from website: [www.scientificamerican.com/article.cfm?id=mirroring-behavior](http://www.scientificamerican.com/article.cfm?id=mirroring-behavior).

# Mirror Neurons



“Single cell recordings and brain imaging have demonstrated that the primate brain contains pre-motor neurons which fire not only when an individual makes a goal-oriented action, but also when an individual simply observes somebody else making the same action. These neurons fire even in the dark, when for example an individual hears the sounds associated with particular actions. These neuronal properties have been called mirror properties which are considered now to have a bearing on the development of emotions.” (p. 1 of 2)

Author (February 19, 2005). American Association for the Advancement of Science Symposium to Take Place On Mirror Neurons. From website: [http://eurekaalert.org/pub\\_releases/2005-02/apa-ast021405.php](http://eurekaalert.org/pub_releases/2005-02/apa-ast021405.php).

# Mirror Neurons



“Much as circuits of neurons are believed to store specific memories within the brain, sets of mirror neurons appear to encode specific sets of actions. This property may allow an individual not only to perform basic motor procedures without thinking about them but also to comprehend those acts when they are observed, without any need for explicit reasoning about them.” (p. 56)

**Rizzolatti, G., Fogassi, L. and Gallese, V. (November, 2006). Mirrors in The Mind. Scientific American, 296 (5), pp. 54-61.**

# Mirror Neurons



- “With knowledge of these neurons, you have the basis for understanding a host of enigmatic aspects of the human mind: ‘mind reading’ empathy, imitation learning, and even the evolution of language. Anytime you watch someone else doing something (or even starting to do something), the corresponding mirror neuron might fire in your brain, thereby allowing you to ‘read’ and understand another’s intentions, and thus develop a sophisticated *theory of other minds*.” (p.2)

Ramachandran, V.S. (3/8/05). Mirror Neurons and Imitation Learning as the Driving Force Behind “The Great Leap Forward” in Human Evolution.

[www.edge.org/3rd\\_culture/ramachandran/ramachandran\\_p2.html](http://www.edge.org/3rd_culture/ramachandran/ramachandran_p2.html)

# Mirror Neurons (RESEARCH-6)

- There are visual and audiovisual mirror neurons in the brain in several places.
- Areas involved in the brain:
  - Inferior Frontal Gyrus: guidance of movement, of intentions
  - Anterior Cingulate Cortex: regulation of empathy
  - Angular Gyrus: semantic comprehension combining sensory input
  - Insula/Amygdala: pain & disgust



**Rizzolatti, G., Fogassi, L. and Gallese, V. (November, 2006). Mirrors in The Mind. Scientific American, 296 (5), pp. 54-61.**

**Ramachandran, V.S. and Oberman, L.M. (November, 2006). Broken Mirrors. Scientific American, 296(5), pp. 62-69.**

# Mirror Neurons May Help Us Generate Appropriate Social Responses

“These results suggest that a set of mirror neurons encodes the observed motor acts not only for action understanding, but to analyze such acts in terms of features that are relevant to generating appropriate behaviors.”

Caggiano, V., Fogassi, L., Rizzolatti, G., Their, P., Casile, A. (April 2009). Mirror Neurons Differently Encode the Peripersonal and Extrapersonal Space of Monkeys. Science. 324 (5925), pp. 403-406; From website: [www.sciencemag.org/cgi/content/abstract/324/5925/403](http://www.sciencemag.org/cgi/content/abstract/324/5925/403).





# Mirror Neurons



## **How does the following relate to AD/HD?:**

“If the mirror neuron system serves as a bridge in this process, then in addition to providing an understanding of other peoples intentions, it may have evolved to become an important component in the human capacity for observation-based learning and sophisticated cognitive skills.” (p. 61)

**Rizzolatti, G., Fogassi, L. and Gallese, V. (November, 2006). Mirrors in The Mind. Scientific American, 296 (5), pp. 54-61.**

# Mirror Neurons



## How does this relate to ADHD?

Barkley (2008) said that those with Combined Type AD/HD and comorbid Alexithymia typically have intact mirror neurons, they just do not use their mirror neurons due to their frontal lobe difficulties.

**Barkley, R.A. (2008). Advances in ADHD: Theory, Diagnosis and Management. J & K Seminars, L.L.C., 1861 Wickersham Lane, Lancaster, PA 17603; 800-801-5415; [www.jkseminars.com](http://www.jkseminars.com).**

# Mirror Neurons and Autism

- “Broken mirror neurons” **MAY** explain isolation and lack of empathy.
- Those with autism spectrum disorders lack activity in many areas of mirror neurons.

Ramachandran, V.S. and Oberman, L.M. (November, 2006).  
Broken Mirrors. Scientific American, 296(5), pp. 62-69.



# Mirror Neurons



- “I suggest, also, that a loss of these mirror neurons may explain autism...Without these neurons the child can no longer understand or empathize with other people emotionally and therefore completely withdraws from the world socially.” (p. 2)

Ramachandran, V.S. (3/8/05). Mirror Neurons and Imitation Learning as the Driving Force Behind “The Great Leap Forward” in Human Evolution.

[www.edge.org/3rd\\_culture/ramachandran/ramachandran\\_p2.html](http://www.edge.org/3rd_culture/ramachandran/ramachandran_p2.html)

# *Mirror Neurons*



I spoke to Uta Frith about using the combination of her group's research on emotional working memory and the mirror neuron research as an explanation of autistic behavior. She said the combination of theories could not differentiate autistic behavior and antisocial behavior.

**Frith, U. (November 1, 2007). Personal Communication. International Dyslexia Association 58<sup>th</sup> Annual Conference, Dallas, TX.**

# *Mirror Neurons*



However, Blair wrote after reviewing the literature, “It is suggested from this literature that empathy is not a unitary system but rather a loose collection of partially dissociable systems. In particular, three divisions can be made: cognitive empathy (or Theory of Mind), motor empathy, and emotional empathy. The two main psychiatric disorders associated...

# Mirror Neurons



“...with empathic dysfunction are considered: autism and psychopathy. It is argued that individuals with autism show difficulties with cognitive and motor empathy but less clear difficulties with respect to emotional empathy. In contrast, individuals with psychopathy show clear difficulties with a specific form of emotional empathy but no indications of impairment with cognitive and motor empathy.” (p. 1 of 2)

Blair, R.J.R. (December, 2005). Responding to the Emotions of Others: Dissociating Forms of Empathy Through the Study of Typical and Psychiatric Populations. Consciousness and Cognition, 14 (4), pp. 698-718. From Website:  
[www.sciencedirect.com/science?\\_ob=ArticleURL&\\_B6WD0-4H39727-2&\\_user](http://www.sciencedirect.com/science?_ob=ArticleURL&_B6WD0-4H39727-2&_user).

# Mirror Neurons



“Our results show that this ‘mirror system’ integrates observed actions of others with an individual’s personal motor repertoire, and suggests the human brain understands actions by motor stimulation.” (p. 1243)

Glaser, D. (January 2005). Mirror Neurons: Research Update. NOVAscienceNOW. Public Broadcasting System (PBS). [www.pbs.org/wgbh/nova/sciencenow/3204/01-resup.html](http://www.pbs.org/wgbh/nova/sciencenow/3204/01-resup.html), p. 1

Calvi-Merino, B., Glaser, D.E., Greeze, J., Passingham, R.E., and Haggard, P. (2005). Action Observation and Acquired Motor Skills: An fMRI Study with Expert Dancers. Cerebral Cortex, 15 (8), p. 1243-1249.



# Alexithymia MAY BE A NEUROBIOLOGICAL DISORDER!

***25% OF THOSE WITH  
AD/HD HAVE  
ALEXITHYMIA.***

**Ratey, J.J., Hallowell, E.M. and Miller, A.C. (1995). Relationship Dilemmas for Adults with ADD: The Biology of Intimacy. In K. Nadeau (Ed.), A Comprehensive Guide to Attention Deficit Disorder In Adults. New York, NY: Bruner Mazel, pp. 218-235.**



# *Alexithymia* MAY BE A **NEUROBIOLOGICAL DISORDER!**

“We now have a psychological term, *alexithymia*, to describe another characteristic associated with Asperger’s syndrome, namely someone who has impaired ability to identify and describe feeling states.” (p. 130)

Attwood, T. (2007). The Complete Guide to Asperger’s Syndrome. Philadelphia, PA: Jessica Kingsley, p. 130.



## ***“Symptoms” of Alexithymia***

- Difficulty identifying different types of feelings
- Difficulty distinguishing between emotional feelings and bodily feelings
- Limited understanding of what caused the feelings
- Difficulty verbalizing feelings
- Limited emotional content in the imagination
- Functional style of thinking
- Lack of enjoyment and pleasure-seeking
- Stiff, wooden posture

Author (January 23, 2003). The Alexithymia FAQ. From web site:

[www.anglefire.com/al4/alexithymia/](http://www.anglefire.com/al4/alexithymia/)

# *What About PTSD?*



“If mild stress becomes chronic, the unrelenting cascade of cortisol triggers genetic actions that begin to sever synaptic connections and cause dendrites to atrophy and cells to die; eventually, the hippocampus can end up physically shriveled, like a raisin.”  
(p. 74)

**Ratey, J.J. (2008). Spark: The Revolutionary New Science of Exercise and The Brain. New York, NY: Little, Brown, p. 74.**

# ***What About PTSD?***



- Hippocampus loses neuronal connections
- Medication and talk therapy grow new neurons

Prince, J. (October 28, 2006). Closing Keynote Address - Bridging the Gap: Putting a Face on AD/HD. Paper presented at the 18<sup>th</sup> Annual CHADD International Conference, Chicago, IL.

Durman, R.S. (2002). European Journal of Psychiatry, 17 (Supplement 3), 306-310.

Saploski, R.M. (2004). Why Zebras Don't Get Ulcers, Third Edition. New York, NY: Holt, p.221

# *What About PTSD?*



“At every level, from the microcellular to the psychological, exercise not only wards off the ill effects of chronic stress; it can also reverse them. Studies have shown that if researchers exercise rats that have been chronically stressed, that activity makes the hippocampus grow back to its preshriveled state.” (p. 79)

**Ratey, J.J. (2008). Spark: The Revolutionary New Science of Exercise and The Brain. New York, NY: Little, Brown.**

# Diagnostic Tools for Alexithymia

- Toronto Alexithymia Scale (TAS-20)

Taylor, G.J. (1992). Twenty-Item Toronto Alexithymia Scale (TAS-20). Graeme J. Taylor, MD, Department of Psychiatry, Mount Sinai Hospital, 600 University Avenue, Toronto, Ontario, CA M5G 1X5; [www.gtaylorpsychiatry.org/tas.htm](http://www.gtaylorpsychiatry.org/tas.htm).

- Observer Alexithymia Scale

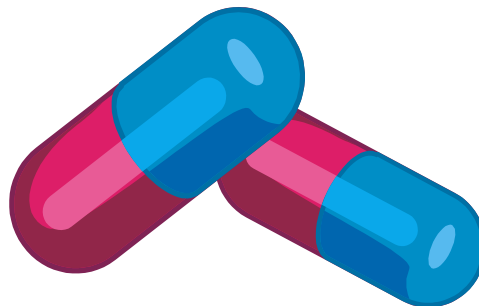
Haviland, M.G., Warren, L., and Riggs, M.L. (October, 2000). Psychosomatics, 41, p. 385-392.



# *Possible Treatment for Emotional Working Memory Problems*

- Stimulant Medication?
  - Lessens Hyperactivity and Impulsivity in AD/HD, Combined Type Individuals
  - Hundreds of Double Blind Studies to Support

**Barkley, R.A. (2006). Attention Deficit Hyperactivity Disorder, 3rd Edition. New York, NY: Guilford.**





# ***Possible Alternative Medicine Treatment for Working Memory Problems (RESEARCH-7 to 10)***



- Working Memory Training:
    - Torkel Klingberg, M.D., Ph.D.
    - Karolinska Institute- Stockholm, Sweden
    - CogMed software company (RM Program)
    - AD/HD deficient in visual spatial working memory (WM) that becomes worse with age.
    - **MAY** help relieve visual spatial WM difficulties and reading comprehension in Combined Type AD/HD.
    - ***More Research is needed!***
- [www.cogmed.com](http://www.cogmed.com)**

Klingberg, T. (February, 2006). Training Working Memory. AD/HD Report, 14 (1), pp. 6-8.

Barkley, R. (February, 2006). Editorial Commentary Issues in Working Memory Training in ADHD. ADHD Report, 14 (1), pp. 9-11.

Ingersoll, B. (October 26, 2006). Complementary Treatments for AD/HD. Paper Presented at the 18<sup>th</sup> Annual CHADD International Conference, Chicago, IL.

Klingberg, T. and Anderson, M. (October 28, 2006). Computerized Training of Working Memory in Children with AD/HD. Paper presented at the 18<sup>th</sup> Annual CHADD International Conference, Chicago, IL.

# Treating Mirror Neuron Difficulties



# *Oxytocin & Vasopressin In Autism*

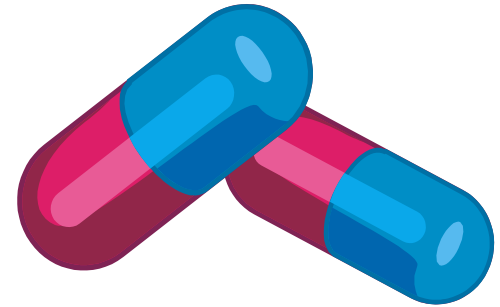


“Oxytocin and vasopressin contribute to a wide variety of social behaviors, including social recognition, communication, parental care, territorial aggression and social bonding.” (p. 2187)

Hammock, E.A.D. and Young, L.J. (December, 2006). Oxytocin, Vasopressin and Pair Bonding: Implications for Autism. Philosophical Transactions of the Royal Society of Biological Sciences, 361 (1476), pp. 2187-2198. From Website:  
<http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1764849>

# Some Treatments For Mirror Neuron Difficulties

- Risperidone, MDMA (ecstasy):  
To raise oxytocin levels
- Biofeedback:  
To help control anxiety
- Oxytocin Nasal Spray



.Author (1997). Use of “Atypical” Neuroleptics in the Treatment of PDDs. MedScape Psychiatry & Mental Health Journal, 2 (4): [www.medscape.com/viewarticle/430897\\_5](http://www.medscape.com/viewarticle/430897_5)

Ramachandran, V.S. and Oberman, L.M. (November, 2006). Broken Mirrors. Scientific American, 296(5), pp. 62-69.

Guastella, A.J., Einfeld, S.L., Gray, K.M., Rinehart, N.J., Tonge, B.J., Lambert, T.J., and Hickie, I.B. (April 1, 2010). Internasal Oxytocin Improved Emotion Recognition for Youth with Autism Spectrum Disorders. Biological Psychology, 67 (7), 692-694; [www.ncbi.nlm.nih.gov/pubmed/19897177](http://www.ncbi.nlm.nih.gov/pubmed/19897177).

***MDMA & Oxytocin Nasal Spray ARE EXPERIMENTAL TREATMENTS!!!!***

# ***Theory of Mind & Mirror Neuron “Software”***

- “Able individuals with autism spectrum disorders can with time and practice achieve awareness of mental states by compensatory learning.” (p. 977)

Frith, U. (2001). Mind Blindness and the Brain in Autism. Neuron, 32, 969-979.

- Possible Treatment Technique -  
Carol Gray – Social Stories:  
<http://www.thegraycenter.org/>



# Professionals Who Can Help With Alexithymia

- Psychologists-American Psychological Association: [www.apa.org](http://www.apa.org)
- Psychiatrists-American Psychiatric Association: [www.apa@psych.org](http://www.apa@psych.org)
- Social Workers-National Association of Social Workers: [www.naswdc.org](http://www.naswdc.org)
- American Association of Marriage and Family Therapists: [www.aamft.org](http://www.aamft.org)
- Counselors-National Board of Certified Counselors: [www.nbcc@nbcc.org](http://www.nbcc@nbcc.org)

# Professionals Who Can Help With Alexithymia (Continued)

- Behavioral Neurology/Neuropsychiatry-American Neuropsychiatric Association:  
[www.anpaonline.org](http://www.anpaonline.org)
- Speech Language Pathologist-American Speech-Language Hearing Association:  
[www.professional.asha.org](http://www.professional.asha.org)



# ***Memes***

- “A meme (pronounced ‘meem’) is ‘an idea, behavior, style or usage that spreads from person to person within a culture’...But controversy has erupted over the proposal, presented here by psychologist Susan Blackmore, that human’s uncanny ability to imitate, and thus to transmit memes, is what sets us apart from other species. Memes, she argues, have been (and are) a powerful force shaping our cultural – and biological – evolution.” (p. 65)

**Blackmore, S. (October 2000). The Power of Memes (Editor’s Introduction). Scientific American, 283 (4), pp. 64-66,68-71,73.**







## ***Memes***

- In a final twist, it would pay for people to mate with the most proficient imitators, because by and large, good imitators have the best survival skills. Through this effect, sexual selection guided by memes, could have played a role in creating our big brains. By choosing the best imitator for a mate women help propagate the genes needed to copy religious rituals, colorful clothes, singing, dancing, and so on...our big brains are selective...

# Memes (Continued)

- “...imitation devices built by and for the memes such as for genes.” (p. 69)

Blackmore, S. (October 2000). The Power of Memes (Editor's Introduction). Scientific American, 283 (4), pp. 64-66,68-71,73.



# Memes & AD/HD



- Barkley spoke of how many of those with AD/HD have difficulty with the internalization of speech, and how this in turn can make AD/HD people vulnerable to others “stealing their ideas.”
- In addition, their impulsivity may cause problems with vicarious learning. Those with AD/HD may have trouble “stealing” the ideas of others.

**Barkley, R.A. (February 19-20, 2002). ADHD and Oppositional Defiant Children. Seminar presented in Phoenix, Arizona.**

**Barkley, R. A. (2006). Attention-Deficit Hyperactivity Disorder, Third Edition. New York, NY: Guilford, p. 310**

# ***Childhood Makes Us Special!***



- Human childhood is about 500,000 years old.
- The new born brain is 25% of adult size. This is not the case of other primates.
- “...complex brain wiring develops when people interact with others and the outside world.” (p. B7)
- This allows for the development of language, a social system, parental bonds and culture.

**Begley, S. (September 16, 2004). Childhood May Separate Humans From Apes. The Wall Street Journal, 244 (54), p. B1 and B7.**

# Play



“...one of the primary purposes of play is to develop the brain.” (p. 121)

“...play teaches the young animal how to handle novelty and surprise, such as the shock of being knocked off balance or a surprise attack.” (p. 123)

**Grandin, T. (2005). Animals in Translation. New York, Scribner.**

# Play

- Dyslexia can negatively effect the ability to have relationships, playmates and play opportunities.

Ryan, M. (1994). The Other Sixteen Hours: The Social and Emotional Problems of Dyslexia. Baltimore, MD: Orton Dyslexia Society.

- AD/HD Children are at great risk for being socially rejected due to their AD/HD symptomatology.

Barkley, R.A. (February 19-20, 2002). ADHD and Oppositional Defiant Children. Seminar presented in Phoenix, Arizona.

- Children with Asperger's Disorder treat other children like objects, they have little or no "theory of mind," imaginative play, or the "memes of life." They do not seek out others to play with.

Attwood, T. (1998). Asperger's Syndrome: A Guide for Parents and Professionals. Philadelphia, PA: Jessica Kingsley.





# *Play*

- Children develop fine and gross motor skills through play.
- This in turn creates relationships, self-esteem and acceptance by others.

**Lerner, J. (1997). Learning Disabilities: Theories, Diagnosis, and Teaching Strategies, Seventh Edition. Boston, MA: Houghton Mifflin.**



# Play

- Isolation hinders children's social and cognitive development.
- Play also directly affects the development of the frontal lobe...executive function.
- Isolation may worsen the genetic problems with executive function caused by AD/HD.
- It can hinder the development of "theory of mind."
- It may also hinder the development of a sense of morality, social roles and the ability to bond with others.

Azar, B. (March, 2002A). It's More Than Just Fun and Games. Monitor On Psychology, 33 (3), pp. 50-51.

Azar, B. (March 2002B). The Power of Pretending. Monitor On Psychology 33 (3), pp. 46-47.



# *Dyssemia*



# Dyssemia

- “Dyssemia is a term that ..... refers to any significant difficulty in understanding or sending nonverbal information.” (Nowicki and Duke, 2002, p. 2)

Nowicki, S. and Duke, M. (2002). Will I Ever Fit In? New York, NY: Free Press.



# Dyssemia

- Nowicki and Duke believed about 10 percent of those with Dyssemia have a neurobiological form of the disorder.

Nowicki, S. and Duke, M. (2002). Will I Ever Fit In? New York, NY: Free Press.

About 7 to 10% of the general population is socially incompetent.

Semrud-Clikeman, M. (2007). Social Competence in Children. New York, NY: Springer, p. 1.



# Dyssemia



- The ability to learn through vicarious learning is very important to learning non-verbal social skills and about the non-verbal environment.

**Nowicki, S. and Duke, M. (2002). Will I Ever Fit In? New York, NY: Free Press.**

# ***Types of Dyssemia***

- Expressive Dyssemia
- Receptive Dyssemia
- Proxemics: The use of space
- Facial expressions
- Paralanguage: Inflection
- Gestures: Give emphasis to speech
- Postures: Long distance social interaction
- Fashion/Objects: Memes
- Chromemics: Time and Rhythm



**Nowicki, S. and Duke, M. (2002). Will I Ever Fit In? New York, NY: Free Press.**



## Dyssemia

- Those with AD/HD have trouble with vicarious learning and would be expected to have trouble learning non-verbal social interaction which is not directly taught. Their impulsivity would make it difficult for them to attend to the non-verbal cues of others, too.

**Barkley, R.A. (February 19-20, 2002). ADHD and Oppositional Defiant Children. Seminar presented in Phoenix, Arizona.**

# *Mimicry*



- “Our talent for mimicry may serve an important purpose. Some studies imply that spontaneous imitation acts as a ‘social glue’ promoting feelings of friendliness and a sense of togetherness.” (p. 55)
- If you mimic someone you are seen as friendly; if not, you are seen as less friendly.
- People with Autism Spectrum Disorders can mimic, but they have difficulty inferring intention.
- You must inhibit imitation to coordinate interactions with others.

Sebanz, N. (December 2006/January 2007). It Takes 2 To...Scientific American: Mind. 17 (6), pp.52-57.



# Dyssemia

In DSM-5 AD/HD can be comorbid with Autism Spectrum Disorders.

Brown, T.E. (2000). Attention-Deficit Disorders and Comorbidities in Children, Adolescents and Adults. Washington, D C: American Psychiatric Press.

Barkley, R.A. (2008). Advances in ADHD: Theory, Diagnosis and Management. J & K Seminars, L.L.C., 1861 Withersham Lane, Lancaster, PA 17603; 800-801-5415; [www.jkseminars.com](http://www.jkseminars.com).

Author (2010). Asperger Disorder. Washington, DC: American Psychiatric Association; [www.dsm5.org/Proposed/Revisions/Pages/proposedrevision.aspx?rid=97#](http://www.dsm5.org/Proposed/Revisions/Pages/proposedrevision.aspx?rid=97#).

Author (2010). Autistic Disorder. Washington, DC: American Psychiatric Association; [www.dsm5.org/Proposed/Revisions/Pages/proposedrevisions.aspx?rid=94](http://www.dsm5.org/Proposed/Revisions/Pages/proposedrevisions.aspx?rid=94)





## Dyssemia

- Those with Asperger's Disorder and High Functioning Autism have problems with Theory of Mind which can cause problems with receptive interpretation of non-verbal cues from others. It can also cause them problems in putting importance on their own non-verbal cues.

Klin, A., Volkmar, F.R. and Sparrow, S.S. (2000). Asperger Syndrome. New York, NY: Guilford.



## Dyssemia

- About 80% of those with Learning Disorders have some type of Reading Disorder/Dyslexia which is a language disorder.

Shaywitz, S. (2003). Overcoming Dyslexia. New York, NY: Knopf.

- Part of language is Non-verbal Paralanguage which includes humming, voice quality, loudness and noises between words.

Nowicki, S. and Duke, M. (2002). Will I Ever Fit In? New York, NY: Free Press.

# Evaluating for Dyssemia

- Diagnostic Analysis of Nonverbal Behavior 2 (DANVA2)
  - Adult faces and voices
  - Child faces and voices
  - African American faces and voices
  - Postures



Available from: Steven Nowicki, Ph.D., Emory University –  
[www.snowik@emory.edu](mailto:www.snowik@emory.edu)

# ***Assessment for Nonverbal Behavior***



Magill-Evans, J., Koning, C., Cameron-Dadava, A. and Manyk, K. (September, 1995). **The Child and Adolescent Social Perception Test.** Journal of Nonverbal Behavior, 19 (3), pp. 151-169.

# ***THE CEREBELLUM***



# What The Cerebellum Does

Allen indicated neuroimaging studies show the Cerebellum is involved in the following functions:

- Attention
- Forms of Learning
- Memory tasks
- Conditional anxiety
- Complex reasoning and problem solving
- Sensory and Motor Tasks



Allen, G. (March 11, 1998). Functional Diversity of the Cerebellum. Paper presented at the New Angles on Motor and Sensory Coordination in Learning Disabilities Topical Medical Workshop; Learning Disabilities Association, International Conference, Washington, DC; Infomedia, tape R130-W1A, Garden Grove, CA.



# The Cerebellum & Social Interaction



“The Cerebellum has only recently been implicated in the normal functioning of social behavior...new research has shown that the cerebellum is important as a mediator in cognition. To perceive an object or event, we must pull together the various sensory qualities and any relevant memories or thoughts in a carefully timed way...the cerebellum assists in delaying or accelerating these associations, and regulates attentional states...”

# The Cerebellum & Social Interaction (Continued)



“Coordinating associations and attention is essential to entering into a relationship with another human being. Communication, conversation, and graceful social interaction all depend on being able to pay attention to another person and to one’s own internal states and to alternate easily back and forth between them.” (p.305)

**Ratey, J.J. (2001). A User’s Guide to the Brain: Perception, Attention, and the Four Theaters of the Brain. New York, NY: Vintage.**



# Dyslexia and The Cerebellum

*80% of dyslexics show signs of cerebellar problems!*



**Fawcett, A. J. and Nicolson, R. I. (2001). Dyslexia and The Role of The Cerebellum.**

**In A. J. Fawcett (Ed.), Dyslexia: Theory & Good Practice. Philadelphia, PA: Whurr, pp. 89-105.**

**Fawcett, A. J. (August 11, 2010). Personal Communication.**

# Dyslexia and The Cerebellum



- Automaticity is the problem!
- When multitasking and rapid processing are needed
- Thinking is a frontal lobe function
- It is a problem of fluency
- “...fluency is in essence the ability to repeat previous actions or thoughts more and more quickly without conscious thought.” (p. 101)

**Fawcett, A.J. and Nicolson, R.I. (2001). Dyslexia and The Role of The Cerebellum. In A.J. Fawcett (Ed.), Dyslexia: Theory & Good Practice. Philadelphia, PA: Whurr, pp. 89-105.**

# Dyslexia and The Cerebellum

## *Nicolson Said Bottom Line:*

“...That means if you have a task that takes 4 hours for the non-dyslexic kid to learn, it will take twice as long for the dyslexic kid; 8 hours. But, its not linear. You have a task which takes 100 hours it will take 10 times as long. If you have a task that takes 10,000 hours it will take 100 times as long, and so on...Therefore if you have something like reading, writing and spelling which takes 100s...”

# Dyslexia and The Cerebellum (Continued)



“...of hours that’s the sort of thing in which dyslexic children are particularly adversely affected.”

**Nicolson, R., and Fawcett, A. (November, 2000). Dyslexia, The Cerebellum and Phonological Skill . Paper presented at the International Dyslexia Association Annual Conference, Washington, DC.**

# Dyslexia and Procedural Training

- The ***Square Root Rule***:

“The extra time needed for a dyslexic child to master a task is proportional to the square root of the time a non-dyslexic child takes.” (Slide 45)

Fawcett, A. (November 5, 2004). Dyslexia and Learning. Paper presented at the 55<sup>th</sup> International Dyslexia Conference, Philadelphia, PA, from handout of slides, Number 45.

# Dyslexia and Automaticity

- DAD: Dyslexia Automaticity Deficit
- Dyslexics get tired more quickly when learning and/or performing a new skill than the norm.
- CC: “This states that, despite their more limited automaticity of skill, dyslexic children are able to perform at apparently normal levels most of the time by ‘consciously compensating,’ that is consciously concentrating (controlled processing) on performance that would normally be automatic.” (pp. 68-69)

**Nicolson, R.I., and Fawcett, A.J. (2008). Dyslexia, Learning, and the Brain. Cambridge, MA: MIT Press, pp. 68-69.**

# European Perspectives of AD/HD



## *Disorder of Attention, Motor Control and Perception (DAMP):*

Swedish researchers have been doing longitudinal research since 1977 with a group of children with AD/HD and Developmental Coordination Disorder which they view as one disorder called DAMP. At age 22 30% of the children still met criteria for AD/HD and DCD.

Gillberg, C. (2001). ADHD with Comorbid Developmental Coordination Disorder: Long-Term Outcome in a Community Sample, ADHD Report, 9 (2), pp. 5-9

Gillberg, C. and Kadesjo, B. (2000). Attention-Deficit/Hyperactivity Disorder and Developmental Coordination Disorder. In T.E. Brown (Ed.), Attention-Deficit Disorders and Comorbidities in Children, Adolescents and Adults. Washington, DC: American Psychiatric Press, pp. 393- 406.

## ***The Neurology of the Combined Type of AD/HD***

Barkley stated there are three areas of the brain that are significantly different in those who are AD/HD:

1. The ***Orbital Prefrontal Cortex-Primarily the Right Side***
2. The ***Cerebellar Vermis-Primarily the Right Side***
3. The ***Basal Ganglia-Striatum and Globus Pallidus***

Barkley, R.A. (2002B). ADHD and Oppositional Defiant Children. Seminar presented February 19-20, Phoenix, AZ.

Barkley, R.A. (2006). Attention-Deficit Hyperactivity Disorder. New York, NY: Guilford,



## ***Barkley's 30% Rule for Combined AD/HD***

People with Combined Type AD/HD tend to be on average 30% less mature in controlling their hyperactivity, impulsivity, and inattentiveness than their non-disabled age peers.

Barkley, R.A. (1998). ADHD in Children, Adolescents and Adults: Diagnosis, Assessment and Treatment. New England Educational Institute, Cape Cod Symposium (August), Pittsfield, MA.

Barkley, R.A. (2008). Advances in ADHD: Theory, Diagnosis and Management. J & K Seminars, L.L.C., 1861 Wichersham Lane, Lancaster, PA 17603; 800-801-5415; [www.jkseminars.com](http://www.jkseminars.com).

# Warning for Driver's Education Instructors with AD/HD Combined Types Students!

- The average 16 year old with Combined Type AD/HD functions like an 11 year old when it comes to controlling their hyperactivity, impulsivity and inattentiveness.
- How many of you would want an 11 year old behind the wheel of a car?



**Barkley, R.A., Murphy, K.R. and Fischer, M. (2008). ADHD In Adults: What The Science Says. New York, NY: Guilford.**

# Warning for Driver's Education Instructors with AD/HD Combined Type Students!



- AD/HD teens are more likely to have driven a car illegally before they have their drivers license.
- They are less likely to be employing good driving habits.
- They will incur many more traffic citations, especially for speeding.
- They are four times more likely to be in an accident.
- They will have even more problems if they have Oppositional Defiant Disorder and/or Conduct Disorder with their AD/HD.
- Unmedicated people with AD/HD who are sober handle a car as well as a person who is not AD/HD who is legally drunk!

**Barkley, R.A. (2006). Attention Deficit Hyperactivity Disorder, Third Edition. New York, NY, Guilford.**

# Warning: Driving and AD/HD

“Fortunately, the driving performance of adults with ADHD has been shown to improve with medication management, at least those aspects of poor driving likely to derive from ADHD itself.” (p. 376)



**Barkley, R.A., Murphy, K.R. and Fischer, M. (2008). ADHD In Adults: What The Science Says. New York, NY: Guilford.**

# Warning for Health Class Instructors!



- People with AD/HD may have a **significantly reduced life expectancy** due to an impulsive lack of concern for health related issues, exercise, diet, drugs, etc.

Barkley, R.A. (1998). Attention-Deficit Hyperactivity Disorder, Second Edition. New York, NY: Guilford.

Barkley, R.A. (2006). Attention-Deficit Hyperactivity Disorder, Third Edition. New York, NY: Guilford, p. 165.

- Spend significantly more time with them emphasizing the importance of good health and developing ways to ensure they follow through with annual check-ups, etc.



# Cerebellum and Asperger's Disorder

There is good neuroimaging data that indicates many with Asperger's Disorder and High Functioning Autism have altered cerebellar function, and are more clumsy than the norm.

Nayate, A., Bradshaw, J.L., and Rinehart, N.J. (2005). Autism and Asperger's Disorder: Are They Movement Disorders Involving The Cerebellum and/or Basal Ganglia? Brain Research Bulletin, 67 (4), pp. 327-334.

Attwood, T. (1998). Asperger Syndrome: A Guide for Parents and Professionals. Philadelphia, PA: Jessica Kingsley.

Attwood, T. (2007). The Complete Guide to Asperger's Syndrome. Philadelphia, PA: Jessica Kingsley, pp. 259-270.

# Exhaustion and Anxiety



# Exhaustion and Learning Disorders

Roffman wrote, “One final ongoing issue that is worthy of mention for many with LD/ADHD is the problem of fatigue. The extra effort required to cope with the continued social and academic demands of schooling can be chronically exhausting.” (p. 217)



**Roffman, A.J. (2000). Meeting The Challenge of Learning Disabilities In Adulthood.  
Baltimore, MD: Brookes.**



# Observation of an Autistic Genius:

- Temple Grandin said for those with autism spectrum disorders social adaptation must occur on a conscious level.
- I believe the same is true for many with Dyslexia, AD/HD, NVLD, etc.

Grandin, T. (1995). Thinking in Pictures and Other Reports from My Life with Autism. New York, NY: Vintage.



# Anxiety and Learning Disorders/AD/HD



Roffman wrote, “Adults with LD/ADHD often experience pressure as they work to cope with their symptoms. Anxiety develops out of such day-to-day occurrences as the loss of yet another set of keys...” (p. 49)

**Roffman, A.J. (2000). Meeting The Challenge of Learning Disabilities In Adulthood. Baltimore, MD: Brookes.**

# Summary Statement



# Kevin T. Blake, Ph.D., P.L.C.'s Observation

- “If you have a neurosocial deficit (i.e., in the brain hardware for social interaction) you are forced to create software to compensate for it. That’s hard and takes time and energy. It also takes an action which is for most people unconscious and makes it conscious, hence it will never be as “automatic and efficient” as an ability...”

# Kevin T. Blake, Ph.D., P.L.C.'s Observation (Continued)

- “...Such compensation skills divide attention and make tasks which are by their nature not conscious more onerous and less efficient creating frustration. When additional stimuli is added on an unpredictable basis this requires a cognitive shift and these learned skills tend to break down which may lead to a feeling of vulnerability and anxiety...”

# Kevin T. Blake, Ph.D., P.L.C.'s Observation (Continued)

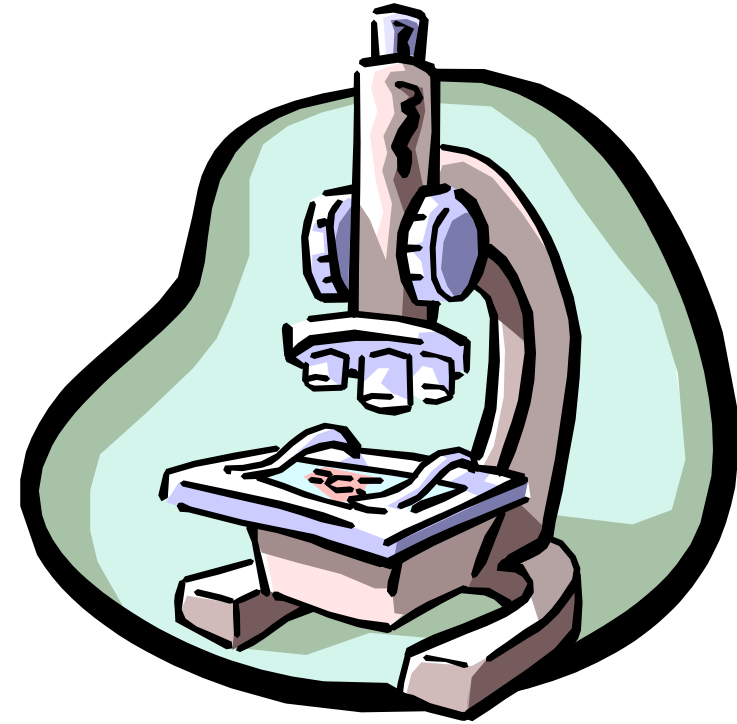
- “...People with such disabilities tend to fatigue faster in social situations and perform cognitively less efficiently when engaged in their social ‘skills’ compensations.
- Those with neurosocial deficits are at risk of not being aware of and/or sensitive to cultural norms and symbols as well as their importance in social interaction. This unawareness may cause significant social rejection, anxiety and frustration for these individuals...”

## Kevin T. Blake, Ph.D. P.L.C.'s Observation (Continued)

- An additional source of frustration and anxiety for individuals with these deficits is most peoples' social interactions are automatic and thus they frequently do not understand the struggles of those who must socialize on a cognitive level.



# *Your Tax Dollars at Work*



## *RESEARCH PROGRAM IN READING DEVELOPMENT, READING DISORDERS, AND READING INSTRUCTION*

*Initiated 1965*



# ***A Good Book That Summarizes this Research***

- Fletcher, J.M., Lyon, G.R., Fuchs, L.S. and Barnes, M.A. (2007). Learning Disabilities: From Identification to Intervention. New York, NY: Guilford.



# Your Tax Dollars At Work



- Run by the National Institute of Child Health and Development (NICHD)
- Which is part of the National Institute of Health (NIH)
- Study began in 1965 and continues today!
- As of 1999 over ***\$150,000,000.00*** has been spent!
- Study now budgeted for ***\$15,000,00.00*** per year!

# Your Tax Dollars At Work



- Conducted at 42 sites in the U.S. and Europe
- Follow-up studies for over 14 years
- Much of the neurological research in this presentation comes from this study.
- China, England, Israel, Russia, Sweden and Turkey have conducted similar studies...

**Lyon, G.R. (1999). In Celebration of Science in the Study of Reading Development, Reading Disorders and Reading Instruction. Paper presented at the International Dyslexia Association 50<sup>th</sup> Annual Anniversary Conference, November 4, 1999, Chicago, IL.**

# Your Tax Dollars At Work

- 30,000 scientific works from NICHD research
- 44,000 studied, 5 years old and up; with 5 year follow-ups



**Lyon, G.R. (Thursday, February 27, 2003). Application of Scientific Research Methods to the Study of Naming Deficits: Systematic Interventions to Improve Fluency in Word Reading Skills and Comprehension. Paper Presented at the 40<sup>th</sup> Annual Learning Disabilities Association Conference, Chicago, IL, Session T-39.**

# Your Tax Dollars At Work



- 48,000 children have been in the study as of 2004. The follow-up study is now 21 years.
- 3,800 in new adult study
- “2 to 6% of the population are the ‘Hard Core’ Dyslexics that will not improve with ‘Good Instruction’. They have the full dyslexic neurology and need multi-sensory approaches.”

**Lyon, G.R. (March 19, 2004). A Summary of Current NICHD Research Findings in Math and Reading Development in English Speaking Children and Plans For Future Research. Seminar Presented at the 41<sup>st</sup> Annual Learning Disabilities Association of America International Conference, Atlanta, Georgia, March 17 to March 20, 2004.**

# Your Tax Dollars At Work



- 3 to 5% of community samples experience Major Depressive Disorder in lifetime.
- Dysthymic Disorder is 3%.
- 3 to 13% Social Phobia
- 3 to 5% Generalized Anxiety Disorder
- 0.4 to 1.6% Bipolar Disorder

**American Psychological Association (1994). Diagnostic and Statistical Manual of Mental Disorders, IV Edition. Washington, DC: American Psychiatric Association.**

# Reading Disorder- Dyslexia



“The idea that learning to read is just like learning to speak is accepted by no responsible linguist, psychologist, or cognitive scientist in the research community.” (pp. 285-286)

**Stanovich, K.E. (1994). Romance and Reality. The Reading Teacher, 47, pp. 280-291.**

# Reading Disorder-Dyslexia



***The Symptoms of Dyslexia are:***

- 1. Weak Phonemic Awareness***
- 2. Slow, Rapid Automated Naming***
- 3. Poor Orthographic Processing***
- 4. Exceptionally Poor Automatization***
- 5. Poor Coordination***

Fawcett, A.J. (2001). Dyslexia: Theory and Good Practice. Philadelphia, PA: Whurr.

Blake, K.. (2003) Personal Observation.



# Reading Disorder-Dyslexia



- Some Dyslexics had all the symptoms.
- Some only had one.
- Four had none of the aforementioned deficits.

**Reid, A.A. (November 11, 2006). Cognitive Profiles of Individuals with Developmental Dyslexia: Insights From a Large Sample Study. Preliminary Findings . Paper presented at the 57<sup>th</sup> Annual International Dyslexia Association Conference, Indianapolis, IN.**

# Definition Of Dyslexia



“Dyslexia is a specific learning disability that is neurological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include...

# Definition Of Dyslexia



...problems in reading comprehension and reduced reading experience that can impede growth of vocabulary and background knowledge.”

***Adopted by the National Institutes of Health (NIH)  
and the International Dyslexia Association (IDA)  
2002***

International Dyslexia Association (April 20, 2005). IDA/NIH Adopts A New Definition of Dyslexia. From website:

[www.interdys.org/serlet/compose?section\\_id=8&page\\_id=69](http://www.interdys.org/serlet/compose?section_id=8&page_id=69), Page 1 Of 2

# THE PAOMNNEHAL PWEOR OF THE HMUAN MNID

- Aoccdrnig to rscheearch at Cmabrigde Uinervisy, it deosn't mttar in waht oredr the ltteers in a wrod are, the olny iprmoatnt tihng is taht the frist and lsat ltteer be in the rghit pclae. The rset can be a taotl mses and you can sitll raed it wouthit a porbelm.

Davis, M. (2003). [www.mrc-cbu.cam.ac.uk/~mattd/Cmabrigde/](http://www.mrc-cbu.cam.ac.uk/~mattd/Cmabrigde/)

Rawlinson, G. (1999). Reibadaily. New Scientist. 162 (2188), p. 55. From website:  
[www.mrc-cbu.cam.ac.uk/~mattd/Cmabrigde/newscientist\\_letter.html](http://www.mrc-cbu.cam.ac.uk/~mattd/Cmabrigde/newscientist_letter.html)

# “LEXDEXIA”



- “reversals” (seeing “was” as “saw”) and “rotations” (“b” as “p”; “p” as “d”, etc.) occur in most children up through fourth grade. This is typical in the development of visual orthographic memory.
- Only about 7% of adult dyslexics have this concern.
- **Dyslexia is not seeing the word “WAS” as “SAW”.**

Anderson, C.W., Jr. (January 23, 2006). Personal Communication.

Badian, N. A. (2005). Does a Visual-Orthographic Deficit Contribute to Reading Disability? Annals of Dyslexia, 55 (1), pp. 28-52.

# Social Anxiety and Shyness





# Social Anxiety/ Shyness



- Fight or Flight Response

Benson, H. (1983). The Relaxation Response. New York, NY: Outlet Books.

Benson, H. (1994). Beyond The Relaxation Response. New York, NY: Berkley Books.

# ***Fight or Flight Response Vs. Tend and Befriend Response***



- ***Shelley Taylor,  
Ph.D.***

**Taylor, S.E. (2002). The Tending Response.  
New York, NY: Holt.**





# *Tend and Befriend*



Taylor, S.E., Klien, L.C., Lewis, B.P., Gruenwald, T.A., Gurung, R.A.R. and Updegraff, J.A. (2002). Biobehavioral Responses to Stress in Females: Tend-and-Befriend, Not Fight-or-Flight. Psychological Review, 107 (3), pp. 411-429.

# *Tend and Befriend*



“Elevated plasma oxytocin was associated with distress in the pair-bond relationship for women, but not for men. Vasopressin, which is closely related to oxytocin in molecular structure and significantly related to male pair-bond behavior in animal studies, was elevated in men who experienced distress in the pair-bond relationship, but not in women. Controlling for estradiol and testosterone did not alter these findings. We conclude that plasma oxytocin in women and plasma vasopressin in men may be biomarkers of distressed pair bond relationships.” (p. 3)

Taylor, S.E., Saphire-Bernstein, S., and Seeman, T.E. (2009). Are Plasma Oxytocin in Women and Plasma Vasopressin in Men Biomarkers of Distressed Pair-Bond Relationships? *Psychological Science*, 21 (1), p. 3-7. From website: <http://pss.sagepub.com/content/21/1/3.abstract>.

# *Tend and Befriend*



Taylor, S.E. (2002). The Tending Instinct: How Nurturing is Essential To Who We Are And How We Live . New York, NY: Holt.



# ***“Savana Anxiety”***



“In general, when dominance hierarchies are unstable, glucocorticoid levels rise. This makes sense, because such instabilities make for stressful times. Looking at individual baboons, however, shows a more subtle pattern: given the same degree of instability, males whose ranks are dropping have elevated glucocorticoid levels, while male whose ranks are rising amid the tumult don’t show this endocrine trait.” (p. 263)

**Saploski, R.M. (2004). Why Zebras Don’t Get Ulcers, Third Edition. New York, NY: Holt.**

# ***“Savana Anxiety”***



“Thus after factoring out rank, lower basal glucocorticoid levels are found in males who are best at telling the difference between threatening and natural interactions; who take the initiative if the situation is clearly threatening; who are best at telling who won or lost; and, in the latter case who are most likely to make someone pay for the defeat.”  
(p. 314)

**Saploski, R.M. (2004). Why Zebras Don't Get Ulcers, Third Edition. New York, NY: Holt.**

# ***“Savana Anxiety”***



“Remarkably, this style is stable over the years of these individuals’ lives, and carries a big payoff – males with this cluster of low glucocorticoid traits remain high ranking significantly longer than average.” (p. 315)

Saploski, R.M. (2004). Why Zebras Don’t Get Ulcers, Third Edition. New York, NY: Holt.

# The “Whitehall” Study



“The Whitehall study of British civil servants begun in 1967, showed a steep inverse association between social class, as assigned by grade of employment, and mortality from a wide variety of diseases.” (p. 1387) A second “Whitehall Study” was conducted from 1985 to 1988. “...we found an inverse relationship between employment grade and prevalence of angina, electrocardiogram evidence of ischaemia, and symptoms of chronic bronchitis. Self-perceived health status and symptoms were worse in subjects with lower status jobs. There were clear employment grade differences in health risk behaviors including...”

# The “Whitehall” Study (Continued)

“...smoking, diet, and exercise, in economic circumstances, in possible effects of early-life environment as reflected by height, in social circumstances at work..., and social supports.”  
(p. 1387).



Marmot, M.G., Smith, G.D., Stanfeld, S., Patel, C., Head, J., White, I., Brunner, E., and Fenney, A. (1991). Health Inequalities Among British Civil Servants: Whitehall II Study. Lancet, 337 (8754), p. 1387-1393. From website: [www.nicbi.nlm.gov/pubmed/1674771](http://www.nicbi.nlm.gov/pubmed/1674771).



# Those at Risk for Social Phobia

- Learning Disabled
- Those with AD/HD
- Those with NVLD
- Those with Asperger's Disorder



- Spreen, O. (1988). Learning Disabled Children Grow-Up: A Follow-Up Into Adulthood. New York, NY: Oxford Press.
- Murphy, K.R. , and Le Vert, S. (1995). Out of The Fog: Treatment Options and Coping Strategies for Adults with Attention Deficit Disorder. New York, NY: Hyperion.
- Hooper, S.R. and Olley, J.G. (1996). Psychological Comorbidity in Adults with Learning Disabilities. In N. Gregg, C. Hoy and A.F. Gay (Eds.), Adults with Learning Disabilities: Theoretical and Practical Perspectives. New York, NY: Guilford, pp. 162-183.
- McAfee, J. (2002). Navigating the Social World: A Curriculum for Individuals with Asperger's Syndrome, High Functioning Autism and Related Disorders. Arlington, TX: Future Horizons.

# Social Anxiety and Shyness



- Attwood (2002) gave an example of an Australian soldier who fought behind enemy lines as a lone sniper in Vietnam who said his social anxiety is much more pronounced than his PTSD from the war ever was.

**Atwood, T. (July, 2002). Social Skills for Children with Asperger's and High Functioning Autism. Workshop presented on July 19, 2002 in Scottsdale, AZ: Future Horizons, Inc. 721 West Abram Street, Arlington, TX 76013.**

# Social Anxiety & Shyness



- 10 to 15% of newborns have an inherited enhanced startle response.
- A 20 year follow-up study of such children with fMRI imaging indicated they are still shy neurologically, especially to strangers.

**Zimbardo, P.G. (2000). The Personal and Social Dynamics of Shyness: Adults and Children. Paper presented at the 50<sup>th</sup> Annual Arizona Psychological Association Conference, October 21, 2000, Tucson, AZ.**

**Schwartz, C.E., Wright, C.I., Shin, L.M., Kagan, J., Rauch, S.L. (June, 2003). Inhibited and Uninhibited Infants “Grown Up”: Adult Amygdalar Response to Novelty. Science, 300 (5627), pp. 1952-1953.**

# Social Anxiety and Shyness



The amygdala is activated in the genetically shy when they are shown pictures of unfamiliar people. This would tend to indicate they feel fear and are overly vigilant when they see strangers. This does not occur in the non-shy.

**Schwartz, C.E., Wright, C.I., Shin, L.M., Kagan, J., Rauch, S.L. (June, 2003). Inhibited and Unihibited Infants “Grown Up”: Adult Amygdalar Response to Novelty. Science, 300 (5627), pp. 1952-1953.**

# Shyness Defined

- “Shyness may be defined experimentally as discomfort or inhibition in interpersonal situations that interferes with pursuing one’s interpersonal or professional goals.” (p. 497)

Henderson, L. and Zimbardo, P. (1998). Shyness. Encyclopedia of Mental Health, 3, p. 497.



# Social Phobia



- Two Subtypes:
  1. Specific Type- public speaking, eating in public, etc.
  2. Generalized Type-very broad
    - These people shy away from treatment: 36% of those who meet DSM criteria actually get treatment

**Dittmann, M. (July/August, 2005). Stemming Social Phobia. Monitor On Psychology, 36 (7), pp. 92-94.**

**Heimberg, R.G., Liebowitz, M.R., Hope, D.A., Scheier, F.R., Holt, C.S., Welkowitz, L.A., Juster, H.R., Campeas, R. Bruch, M.A., Cloitre, M, Fallon, B., Klein, D.F. (1998). Cognitive Behavior Group vs Phenelzine Therapy for Social Phobia. Archives of General Psychiatry, 55, p. 1133-1141.**

# ***Shyness in a Nutshell***

- “S”ELF-BLAME AND SHAME
- “A”VOIDANCE
- “D”ISTRESS
- “F”EAR OF NEGATIVE EVALUATION
- “I” MUST BUT I CAN’T
- “X”-POSURE: FEAR OF BOTH FAILURE AND SUCCESS
- “S”ELF SABOTAGE



**Zimbardo, P.G. (2000). The Personal and Social Dynamics of Shyness: Adults and Children. Paper presented at the 50<sup>th</sup> Annual Arizona Psychological Association Conference, October 21, 2000, Tucson, AZ.**

# Shyness Treatment



- I asked Zimbardo what he thought those who had neurobiological disorders who were genetically shy needed most and he said, “Training in the skills to make legitimate excuses.”

**Zimbardo, P.G. (2000). The Personal and Social Dynamics of Shyness: Adults and Children. Paper presented at the 50<sup>th</sup> Annual Arizona Psychological Association Conference, October 21, 2000, Tucson, AZ.**



# Shyness Treatment



- Cognitive Behavioral Therapy and Antidepressant Medication works 80% of the time with 5 year follow-up. Thought to be best method of treatment (Richard Heimberg, Ph.D.).

**Dittmann, M. (July/August, 2005). Stemming Social Phobia. Monitor On Psychology, 36 (7), pp. 92-94.**

**Heimberg, R.G., Liebowitz, M.R., Hope, D.A., Scheier, F.R., Holt, C.S., Welkowitz, L.A., Juster, H.R., Campeas, R. Bruch, M.A., Cloitre, M, Fallon, B., Klein, D.F. (1998). Cognitive Behavior Group vs Phenelzine Therapy for Social Phobia. Archives of General Psychiatry, 55, p. 1133-1141.**

# *Treatment of Social Anxiety*



- Zimbardo (2000) described a 26 week treatment program at his shyness clinic that includes the following: Cognitive Behavior Modification/Cognitive Restructuring, Self-Esteem Restructuring, Support Groups, Practice, Medications, Video Social Skills Training, Encouragement, etc.
- [www.shyness.com](http://www.shyness.com) and [www.shynessinstitute.com](http://www.shynessinstitute.com)

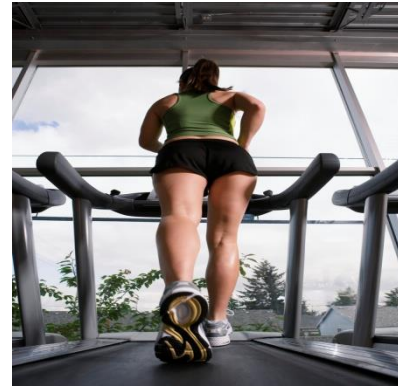
Zimbardo, P.G. (2000). The Personal and Social Dynamics of Shyness: Adults and Children. Paper presented at the 50<sup>th</sup> Annual Arizona Psychological Association Conference, October 21, 2000, Tucson, AZ.

# *Treatment of Social Anxiety/*



- Henderson, L. (2011). Improving Social Confidence and Reducing Shyness Using Compassion Focused Therapy. Oakland, CA: New Harbinger.
- Henderson, L. (2009). Social Fitness Training Manual: A Cognitive-Behavioral Approach to Treating Shyness and Social Anxiety Disorder. Berkley, CA: The Shyness Institute.

# *Treatment of Social Anxiety/Shyness*



- Aerobic Exercise:
  - “As for the trait, the majority of studies show that aerobic exercise significantly alleviates symptoms of any anxiety disorder.” (p. 92)

**Ratey, J. (2008). Spark: The Revolutionary New Science of Exercise and The Brain. New York, NY: Little, Brown.**

# ***Good Resources on Exercise and Counseling***



- Ratey, J.J. (Fall, 2010). Your Brain On Exercise. ADDitude, 11 (1), 36-39.
- Ratey, J.J. (2008). Spark: The Revolutionary New Science of Exercise and The Brain. New York, NY: Little, Brown.
- ***Always consult a physician before starting an exercise program!***

# ***People and Organizations Who Can Help With Social Anxiety/Shyness***

- American Psychiatric Association: [www.apa@psych.org](http://www.apa@psych.org)
- American Psychological Association: [www.apa.org](http://www.apa.org)
- American Association of Marriage and Family Therapists: [www.aamft.org](http://www.aamft.org)
- National Board of Certified Counselors: [www.nbcc@nbcc.org](http://www.nbcc@nbcc.org)
- National Association of Social Workers: [www.naswdc.org](http://www.naswdc.org)
- Anxiety Disorder Association of America: [www.adaa.org](http://www.adaa.org)



# Emotional Salience Landscape Difficulties- Mirror Neurons

- Problems in the amygdala and lack of emotional salience landscape may account for sensory sensitivity.
- These problems are found in those with Autism Spectrum Disorders.
- Insula/Amygdala : pain & disgust

Ramachandran, V.S. and Oberman, L.M. (November, 2006). Broken Mirrors.  
Scientific American, 296(5), pp. 62-69.



# Emotional Salience Landscape Difficulties- Mirror Neurons



“In a typical child, sensory information is relayed to the amygdala, the gateway to the emotion-regulation limbic system. Using input from stored knowledge, the amygdala determines how the child should respond emotionally to each stimulus, creating a salience landscape of the child’s environment. In children with autism, though the connections between the sensory areas and the amygdala may be altered, resulting in extreme emotional responses to trivial events and objects.” (p. 68)

**Ramachandran, V.S. and Oberman, L.M. (November, 2006). Broken Mirrors. Scientific American, 296(5), pp. 62-69.**



# Emotional Salience Landscape Difficulties - Mirror Neurons



When the child with Autism Spectrum Disorder looks into another's eyes:

1. The "...altered connection between the cortex and amygdala distorts (the) child's response.
2. (The) Amygdala triggers the autonomous nervous system, raising heart rate.
3. (As a result the) Child looks away to reduce stress."  
(p. 68)

**Ramachandran, V.S. and Oberman, L.M. (November, 2006). Broken Mirrors. Scientific American, 296(5), pp. 62-69.**

# Emotional Salience Landscape Difficulties

## Mirror Neurons



“People with autism show reduced mirror neuron activity in the inferior frontal gyrus, a part of the brain’s premotor cortex, perhaps explaining their inability to assess the intentions of others. Dysfunctions of mirror neurons in the insula and anterior cingulate cortex may cause related symptoms, such as the absence of empathy, and deficits in the angular gyrus may result in language difficulties. People with autism also have structural changes in the cerebellum and brain stem.” (p. 65)

**Ramachandran, V.S. and Oberman, L.M. (November, 2006). Broken Mirrors. Scientific American, 296(5), pp. 62-69.**

# *Creating More Oxytocin*



Interactive touch between humans can produce more oxytocin in the brain. It can even increase one's level of trust.

**Morhenn, V.B., Park, J.W., Piper, E., and Zak, P.J. (November, 2008). Monetary Sacrifice Among Strangers is Mediated by Endogenous Oxytocin Release After Physical Contact. Evolution and Human Behavior, 29 (6), pp. 375-383.**

# *Oxytocin and Squeezing*



Many Native American cultures used cradleboards to carry their infants.



# Emotional Salience Landscape Difficulties-Mirror Neurons

- Temple Grandin's "squeeze machine"
- Hirstein's "squeeze vest"  
Elmhurst College
- Risperidone, MDMA (ecstasy)
- Biofeedback
- Under Armor-- Compression underwear:  
[www.underarmour.com](http://www.underarmour.com)

Grandin, T (1992). Calming Effects of Deep Touch Pressure in Patients with Autism, College Students, and Animals. Journal of Child and Adolescent Psychopharmacology, 1 (2). From website:  
[www.grandin.com/inc/squeeze.html](http://www.grandin.com/inc/squeeze.html)

Ramachandran, V.S. and Oberman, L.M. (November, 2006). Broken Mirrors. Scientific American, 296(5), pp. 62-69.

Author (1997). Use of "Atypical" Neuroleptics in the Treatment of PDDs. MedScape Psychiatry & Mental Health e Journal, 2 (4): [www.medscape.com/viewarticle/430897\\_5](http://www.medscape.com/viewarticle/430897_5)

**THE ABOVE ARE EXPERIMENTAL TREATMENTS!!!!**



# Memory Disorders





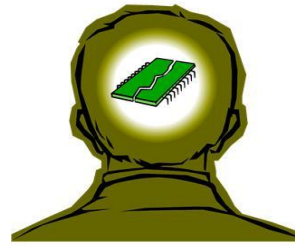
# **Memory Problems Everyone Has**

- **Transience: problems accessing memory over time**
- **Absent-mindedness: lapses in attention**
- **Blocking: tip of the tongue experience**
- **Suggestibility: the incorporation of misinformation into memory**
- **Bias: altering memory to fit beliefs**
- **Misattribution: believing you heard something you didn't.**

Murray, B. (October, 2003). Convention Award-Winner Daniel Schacter Explained the Ways Memory Tricks Us. Monitor On Psychology, 34 (9), pp. 28-29.

Schacter, D. (2001). The Seven Sins of Memory: How the Mind Forgets and Remembers. New York, NY: Houghton Mifflin.

# Memory Disorders



- **Dysnomia:**
  - “...is a word-finding problem in remembering and expressing words.” (p. 373)
  - “Dyslexic people are slower at naming series of various types of familiar stimulus items– objects, colors, numbers, letters.” (p. 29)
  - This is part of the Rapid Automatized Naming Deficit, or “Double Deficit” of dyslexia.

Lerner, J. (1997). Learning Disabilities: Theories Diagnosis, and Teaching Strategies, 7<sup>th</sup> Edition. Boston, MA: Houghton Mifflin.

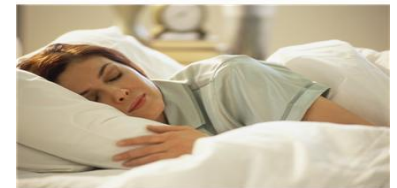
Clark, D.B. (1988). Dyslexia: Theory and Practice of Remedial Instruction. Parkton, MD: York.

Wolf, M., and O’Brien, B. (2001). On Issues of Time, Fluency, and Intervention. In A.J. Fawcett (Ed.), Dyslexia: Theory and Good Practice. Philadelphia, PA: Whurr, pp. 124-140.



## ***Two General Memory Systems***

- **Declarative Memory**: Remembering the what, i.e. Facts and Events
- **Procedural Memory**: Knowing how to do something
- Proficient Reading is a skill and is a product of procedural memory.
- With procedural memory robust gains in knowledge are made after training is terminated.
- Train until the person's new behavior plateaus, stop training then allow to sleep. The next day they will have improved behavior and less errors.



## ***Two Memory Systems (Continued)***

- This will not happen if the person is not allowed to sleep and/or if they are then taught a competing task.
- If the training situation is considered novel, learning will continue to increase.

Karni, A. (November 3, 2004). Brain Basis of Skill Acquisition and Learning: How do they Relate to Reading? Paper presented during the Neural Basis of Reading and Other Forms of Skills Acquisition Symposium of the 55<sup>th</sup> Annual International Dyslexia Association Conference, Philadelphia, PA, Session W-1.

Karni, A., Tanne, D., Rubenstein, B.S., Askensay, JJ., and Saji, D. (1994). Dependence on REM Sleep of Overnight Improvement of A Perceptual Skill. Science, 265 (5172), pp. 679-682.



# ***Sleep and Memory***



- “...sleep allows us to process and retain new memories and skills.” (p. 58)
- Deprive sleep/ block training improvement in skill
- “Evidence for sleep’s effect on declarative memory is much weaker than its effect on procedural memory.” (p. 59)

Winerman, L. (January, 2006). Let’s Sleep On It. Monitor On Psychology, 37 (1), pp. 58-60.

Stickgold, R. (2005). Sleep-Dependent Memory Consolidation. Nature, 437 (7063), pp. 1272-1278.

# Dyslexia May Be Partially a Disorder of Procedural Memory

“Deficits in dyslexia are attributed to an intact declarative learning system combined with an impaired procedural learning system –a network that includes prefrontal language systems, basal ganglia, parietal and cerebellar structures.” (p. 135)

Nicolson, R., and Fawcett, A. (2007). Procedural Learning Difficulties: Reuniting the Developmental Disorders. Trends in Neuroscience, 30 (4), pp. 135-141.

Nicolson, R. I., and Fawcett, A.J. (2008). Dyslexia, Learning and the Brain. Cambridge, MA: MIT Press.

# Developmental Prosopagnosia





# Problems Remembering Faces

- **Prosopagnosia**: Inability to recognize faces, even one's own face.” (p. 1168)

Taber's (1981). Taber's Cyclopedic Medical Dictionary. Philadelphia, PA:F.A. Davis

- **Joaachim Bodamer, M.D. 1947**: German soldiers with brain injuries who could no longer see faces coined term. “*Prosopon*” meaning face + “*agnosia*” meaning nonrecognition from Greek.

Grueter, T. (August/September, 2007). Forgetting Faces. Scientific American: Mind, 18 (4), 68-73.

# Subtypes of Prosopagnosia



- **Acquired Prosopagnosia**: Caused by insult to the brain; what Bodamer wrote about in 1947.
- **Developmental Prosopagnosia**: “...characterized by severely impaired face recognition. Individuals with this disorder, which runs in families, have no history of brain damage and intact early visual systems.” (p. 166)

Grueter, T. (August/September, 2007). Forgetting Faces. Scientific American: Mind, 18 (4), 68-73.

Duchaine, B.C. and Nakayama, K. (2006). Developmental Prosopagnosia: A Window to Content –Specific Face Processing. Current Opinion in Neurobiology, 16, 166-173.



# ***Developmental Prosopagnosia***

“Developmental prosopagnosics (DPs) have not suffered any obvious brain damage, yet they have deficits in face recognition that can be as severe and as selective as those seen in acquired prosopagnosics.” (P. 166)



Duchaine, B.C. and Nakayama, K. (2006). Developmental Prosopagnosia: A Window to Content –Specific Face Processing. Current Opinion in Neurobiology, 16, 166-173.



# ***Prosopagnosia***



- Possible Associated Conditions:
  - Problems with recognition of facial expression of emotion
  - Problems with gender of face discrimination
  - Problems with age of face discrimination
  - Problems with **TOPOGRAPHAGNOSIA**: difficulty with personal navigation; getting lost easily
  - Asperger's Disorder

**Galaburda, A.M. and Duchaine, B.C. (2003). Developmental Disorders of Vision. Neurologic Clinics, 21 (3), 687-707.**

# *Prosopagnosia*



- Possible Associated Conditions:
  - Central Auditory Processing Disorder (CAPD):  
“The inability to understand spoken language in a meaningful way in the absence of what is commonly considered a hearing loss.” (Sineps and Hunter, 1997)

Duchaine, B.C. (2000). Developmental Prosopagnosia with Normal Configural Processing. Cognitive Neuroscience and Neuropsychology. **11** (1), 79-82.

Choisser, B. (August, 14, 2007). Face Blind! From website: [www.choisser.com/faceblind/about.html](http://www.choisser.com/faceblind/about.html), p. 7 of 10.

Sineps, D. and Hunter, L. (1997). I Can Hear But...When Auditory Perception and Listening Break Down: Implications For Language and Reading. Paper presented at the International Dyslexia Association Annual Conference, Minneapolis, MN, November 13, 1997, Session T-45.

# *Prosopagnosia*



- Remembering Faces:
  - This is an important ability for survival.
    - It lets you know “friends and foes.”
    - It helps you maintain relationships.
    - It helps you remember the social status of others.

**Ratey, J.J. (2001). A User's Guide to the Brain: Perception, Attention and the Four Theaters of the Brain. New York, NY: Vintage.**

# Developmental Prosopagnosia (**RESEARCH-11**)



- Affects 2 to 3 percent of the population
- That equates to 6,000,000 Americans!
- Those affected often know something is wrong, but they don't know exactly what.

Goldberg, C. (June 14, 2006). When Faces Have No Name. The Boston Globe. From website: [www.boston.com/yourlife/health/diseases/articles/2006/06/14/when\\_faces\\_have\\_no\\_name/](http://www.boston.com/yourlife/health/diseases/articles/2006/06/14/when_faces_have_no_name/)

Grueter, T. (August/September, 2007). Forgetting Faces. Scientific American: Mind, 18 (4), 68-73.

# *Symptoms of Prosopagnosia*



- Extreme difficulty recognizing faces. Even with a person who is well known by the sufferer (i.e., a parent, spouse, best friend, etc.).
- Appears aloof/arrogant, does not respond to people they “know” when they see them.
- Often complain they cannot follow movies or TV shows because they cannot remember the identity of characters.
- They tend to recognize people by hair, gait, clothing, voice, context or other information.

Author (August 14, 2007). [www.faceblind.org/research](http://www.faceblind.org/research), p. 1 of 3.

# ***Additional Symptoms of Prosopagnosia Found in Children***



- It may take them months to recognize their classmates.
- School transition may be a problem.
- Extreme separation anxiety and stranger wariness may be present.
- Changes in peoples' appearance (i.e., new glasses, new hair style, etc.) may be a problem.
- Feelings of frustration, isolation and embarrassment

Grueter, T. (August/September, 2007). Forgetting Faces. Scientific American: Mind, 18 (4), 68-73.

# ***Face Perception***

- The right Fusiform Gyrus typically does not respond to objects.
- This area reorganizes faces into wholes.
- Inverted faces are more difficult to process than upright faces.
- The fusiform gyrus helps to differentiate between visually similar stimuli.
- Greebles-novices treat them as objects and experts treat them in a holistic manner.

Gauthier, I. (November 3, 2004). Face Processing: Is It Hard-wired or Learned? Evidence from Brain Imaging Studies. Paper presented at the 55<sup>th</sup> Annual International Conference seminar, *The Neural Basis of Reading and Other Forms of Skill Acquisition*, Philadelphia, PA, Session: W-1.

Gauthier, I., and Tarr, M.J. (1997). Becoming a “Greeble” Expert: Exploring Mechanisms for Face Recognition. Vision Research, **37** (120), 1673-1682.

# ***Face Perception***

- Adults with Autism lack specialization for faces in the right fusiform gyrus, they use it for other things: toilet plungers, etc.
- Left fusiform gyrus (“Word Form Area”) responds somewhat to strings of letters of the same font and to real words not non-words.
- Letters are not processed like shapes or strings.

**Gauthier, I. (November 3, 2004). Face Processing: Is It Hard-wired or Learned? Evidence from Brain Imaging Studies. Paper presented at the 55<sup>th</sup> Annual International Conference seminar, *The Neural Basis of Reading and Other Forms of Skill Acquisition*, Philadelphia, PA, Session: W-1.**



# ***Face Perception***

- The Fusiform Face Area (FFA) responds much more to faces than to other objects.
- Nine different labs have found that those with Autism Spectrum Disorders have a hypoactivation of the FFA when viewing faces.
- Developmental Prosopagnosia and Developmental Agnosia are separate disorders.

Schultz, R.T. (2005). Developmental Deficits in Social Perception in Autism: The Role of the Amygdala and Fusiform Face Area. International Journal of Developmental Neuroscience, 23, 125-141.

Duchaine, B. and Nakayama, K. (2005). Dissociations of Face and Object Recognition in Developmental Prosopagnosia. Journal of Cognitive Neuroscience, 17, 249-261 (From Abstract).

# *Developmental* *Prosopagnosia* (**RESEARCH-12**)



- “The hereditary type of prosopagnosia has an autosomal dominant type of inheritance. This means that men and women are affected in equal numbers. In our experience women are more willing to talk about their face recognition problems, though.” (Thomas Grueter, M.D.)
- If one parent has Prosopagnosia their child has a 50% chance of having it.

Grueter, T. (August 14, 2007). Personal Communication.

Grueter, T. (August/September, 2007). Forgetting Faces. Scientific American: Mind, 18 (4), 68-73.

Kennerknecht, I., Grueter, T., Wellin, B., Wentzek, S., Horst, J., Edwards, S. and Grueter, M. (June, 2006). First Report of Prevalence of Non-Syndromic Hereditary Prosopagnosia. American Journal of Medical Genetics, Part A, 140A (15), Pages 1617-1622 (From abstract).

# ***Whose at Risk for Prosopagnosia?***



- Remembering Faces:
  - LD and AD/HD people often have problems remembering faces.

Roffman, A.J. (2000). Meeting The Challenge of Learning Disabilities In Adulthood. Baltimore, MD: Brookes.

- Those with Asperger's Disorder are at risk for not remembering faces.

Attwood, T. (2007). The Complete Guide to Asperger's Syndrome. Philadelphia, PA: Jessica Kingsley, p. 130.

# ***Prosopagnosia and NVLD (Nonverbal Learning Disorders)***



“Hence, it appears that children with NLD have a specific deficit in immediate memory for faces. This facial memory deficit may be linked to a deficit in right hemisphere functioning which has already been implicated in facial processing and may also be linked with other disorders (e.g., autism spectrum disorder) in which similar facial processing deficits have been documented.” (p. 1-2)

**Liddell, G.A. and Rasmussen, C. (August, 2005). Memory Profile of Children with Nonverbal Learning Disability. Learning Disabilities Research and Practice, 20 (3), 137-141 (From abstract).**

# ***Prosopagnosia and Autism Spectrum Disorders***



“Although not part of current diagnostic criteria, much evidence suggests that persons with ASD have marked deficits in face perception.” (p. 127)

Schultz, R.T. (2005). Developmental Deficits in Social Perception in Autism: The Role of the Amygdala and Fusiform Face Area. International Journal of Developmental Neuroscience, 23, 125-141.

# *How to Assess Developmental Prosopagnosia*



- Cambridge Face Memory Test
- Test My Face Recognition- Internet test

Duchaine, B. and Nakayama, K. (2006). The Cambridge Face Memory Test: Results for Neurologically Intact and an Investigation of It's Validity Using Inverted Face Stimuli and Prosopagnosic Participants. *Neuropsychologia*, 44, pp. 576-585. From web site: [www.faceblind.org/people/duchaine06neuropsychologia.pdf#search=%22Cambridge%20Face%20Memory%20Test%22](http://www.faceblind.org/people/duchaine06neuropsychologia.pdf#search=%22Cambridge%20Face%20Memory%20Test%22) .

Test My Face Recognition (From web site): [www.faceblind.org/index.php](http://www.faceblind.org/index.php)



# *Treatment of Prosopagnosia*

- “Prosopagnosics cannot be cured, but they can and do learn ways to recognize people.”  
(p. 70)

Grueter, T. (August/September, 2007). Forgetting Faces. Scientific American: Mind, 18 (4), 68-73.



# ***Treatment of Prosopagnosia***



“A treatment programme on training in perception, and analysis of facial features and familiar-face naming was conducted. Treatment resulted in excellent face naming for familiar faces, a decreased reliance on nonfacial cues and a reduction in AL’s tendency to misidentify unfamiliar faces as family members.” (p. 1 of 2)

**Brunsdon, R., Coltheart, M. Nickels, L. and Jay, P. (September 2006). Developmental Prosopagnosia: A Case Analysis and Treatment Study. Cognitive Neuropsychology. 23 (6), 822-840 (From abstract).**



# ***Treatment of Prosopagnosia: “Are you my Mother?”***

- Encourage the person to look at peoples faces when socializing.
- Introduce new people slowly and emphasize their characteristics: “Say hi to Billy with the red hair and freckles.”
- Have children meet teachers long before school starts and have the child meet with them often.
- Have teachers keep their appearance “stable.”
- Play introduction games.
- Post photos of teachers, friends, parents on wall.

**Grueter, T. (August/September, 2007). Forgetting Faces. Scientific American Mind, 18 (4), 68-73.**

# *Computer Programs to Treat Prosopagnosia*

## **(Research-13)**

- “Let’s Face It!” – Face Recognition Program and workbook for children with Autism Spectrum Disorders (University of Victoria Brain and Cognition Lab & the Yale Child Study Center)
- Teaches facial recognition and emotion recognition in 20 hours!
- It is **FREE!**



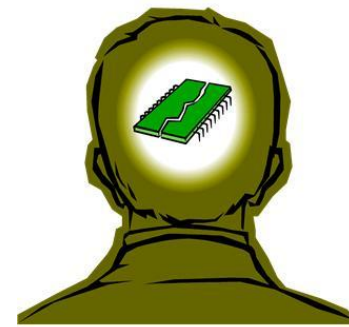
From: <http://web.unic.ca/~letsface/letsfaceit/index.php>

# *Mnemonic Techniques to Remember Faces*

- Lucas, J. (2000). Names and Faces Made Easy: The Fun Way To Remember People. Lucas.
- [www.jerrylucas.com](http://www.jerrylucas.com)



# Executive Memory Function Problems



- Working Memory:
  - “...denotes a person’s information-processing capacity” (p. 4-5)
  - Is the “memory buffer in the brain.”
  - It allows for “theory of mind.”
  - “Remembering so as to do.”(non-informational)

Wechsler Adult Intelligence Scale- Third Edition, Wechsler Memory Scale-Third Edition (1997). Technical Manual. San Antonio, TX : Psychological Corporation.

Brown, T. E. (October 11, 2001). Assessment and Treatment of Complicated ADHD Across the Lifespan. Seminar Presented at the Arizona Association of School Psychologists 33<sup>rd</sup> Annual Conference, Mesa, AZ.

Frith, C. D. and Frith, U. (1999). Intersecting Minds-A Biological Basis. Science, 286, pp. 1692-1695.

Barkley, R.A. (2008). Advances in ADHD: Theory, Diagnosis and Management. J & K Seminars, L.L.C., 1861 Withersham Lane, Lancaster, PA 17603; 800-801-5415; [www.jkseminars.com](http://www.jkseminars.com).

# Executive Functioning & Social Abilities



- Stage 1: Problems Encoding Social Information- EF level-Traditional Social Skills programs typically don't work because the child cannot connect behavior to the situation.
- Stage 2 and afterward: Problems generating responses-easier to remediate with Traditional Social Skills programs.

**Semrud-Clikeman, M. (Spring, 2003). Executive Function and Social Communication Disorders. Perspectives, 29 (2), p. 20-22.**

**Semrud-Clikeman, M. (2007). Social Competence in Children, New York, NY: Springer.**

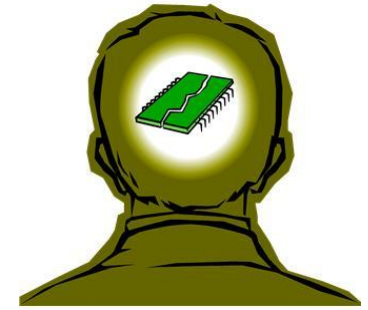
# Working Memory and AD/HD



- “AD/HD kids are not ‘clueless’. They’re ‘cueless’.”

Goldstein, S. (November 20, 1998). Pathways to Success: Evening the Odds in the Treatment of Attention-Deficit Hyperactivity Disorder. Seminar presented in Tucson, AZ.

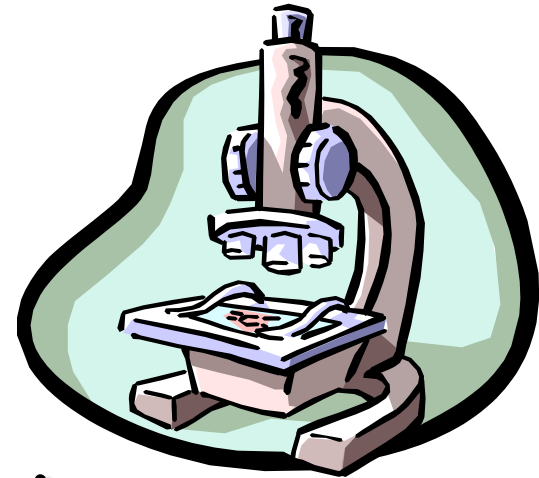
# Executive Functions and AD/HD



- It appears the problems those with AD/HD have with academic achievement and social communication and behavior are related to EF difficulties.
- This does not appear to be the case in those with ODD and/or CD without AD/HD.

**Clark, C., Prior, M. and Kinsella, G. (2002). The Relationship Between Executive Function Abilities, Adaptive Behavior, and Academic Achievement in Children with Externalizing Behavior Problems, Journal of Child Psychology and Psychiatry, 43, p. 785-796. From: (June, 2003). Executive Function and Communication Difficulties May Contribute to Adaptive Behavior Problems. ADHD Report, p. 12-13.**

# Summary of Barkley's Theory



Step 1: *Response Delay*

Step 2: *Prolongation*

Step 3: *Rule Governed Behavior*

Step 4: *Dismemberment of the Environment*

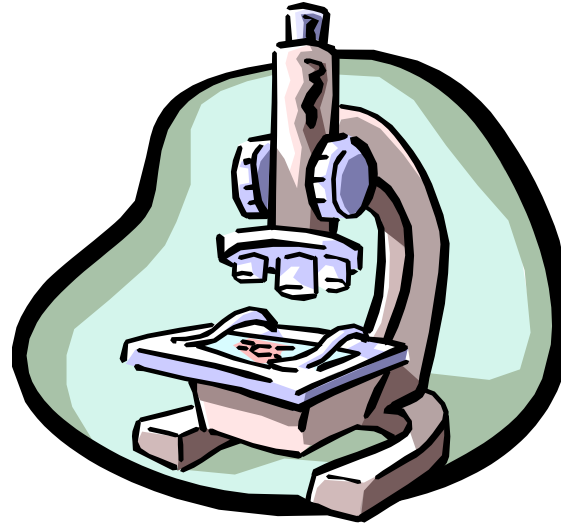
**Barkley, R.A. (1997). ADHD and the Nature of Self-Control. New York, NY: Guilford.**

**Barkley, R.A. (2006). Attention-Deficit Hyperactivity Disorder, Third Edition. New York, NY: Guilford.**



# Brown's Theory Summarized

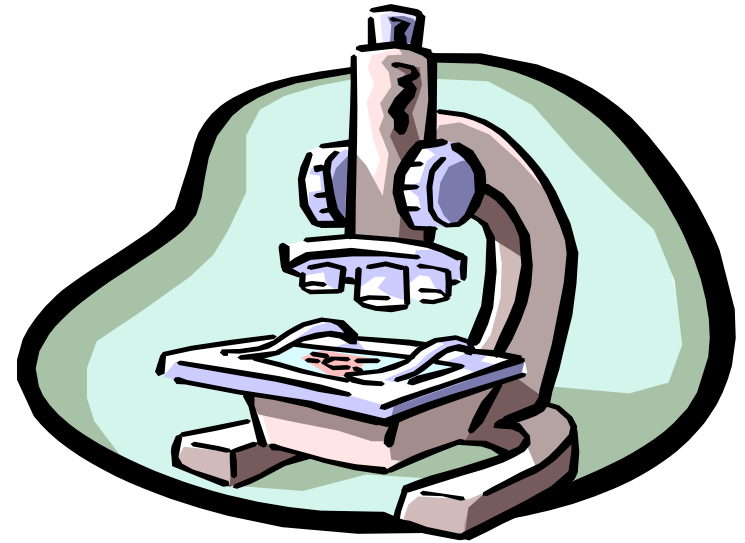
1. **ACTIVATION**
2. **FOCUS**
3. **EFFORT**
4. **EMOTION**
5. **MEMORY**
6. **ACTION**



Brown, T.E. (2002). Social Ineptness & “Emotional Intelligence” in ADHD. Paper Presented at the 14<sup>th</sup> Annual CHADD International Conference, Miami Beach, FL, October 17-19.

Brown, T. E. (February, 2008). Executive: Describing Six Aspects of A Complex Syndrome. Attention!, P. 12-17; From website:  
[www.drthomasebrown.com/pdfs/Executive\\_Functions\\_by\\_Thomas\\_Brown/pdf](http://www.drthomasebrown.com/pdfs/Executive_Functions_by_Thomas_Brown/pdf).

*Your Tax Dollars at Work*  
**(RESEARCH-14)**

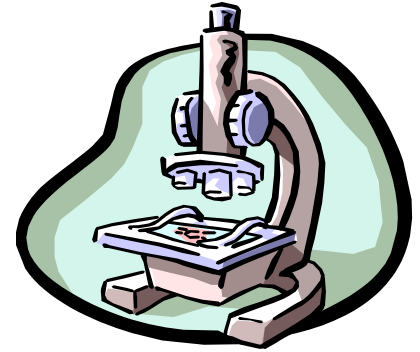


**The Multimodal Treatment Study of**  
**Children with Attention Deficit**  
**Hyperactivity Disorder**

*(MTA Study = Multimodal Treatment Assessment of AD/HD)*

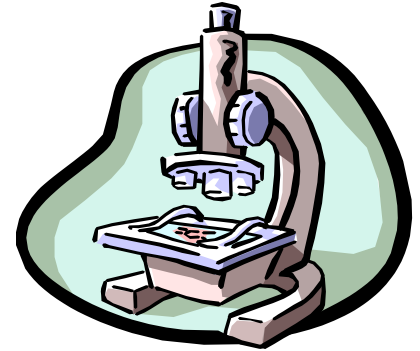
**1999**

# The MTA Study



- Mid-1990s
- 579 AD/HD, Combined Type Children
- Demographics matched the 1990 US Census
- Randomly assigned to one of four groups
- After assigned to group each child was thoroughly reassessed to make sure they were AD/HD, CT

# The MTA Study



- Group 1: “Experimental Medication”
  - Three medications used
    - Methylphenidate (Ritalin)
    - D Amphetamine (Dexedrene)
    - Pemoline (Cylert)\*\*
      - If medication one did not work or there was a side effect, changed to the next medication and so on.
  - Each month parent and child was seen by physician. Child checked for response to treatment and side effects. Each month questionnaires given to parents and teachers.

# ***Warning: Stimulants & AD/HD***

- “The FDA’s review of sudden death or cardiovascular incidents in patients taking AD/HD medications found 25 reports of death between 1999 and 2005 and 54 reports of serious cardiovascular problems. Some of these patients had pre-existing heart conditions or hypertension, the report noted.”

Goodman, B. (2/23/2006). FDA Warning on AD/HD Medications “Premature”;  
National AD/HD Advocacy Group Urges Further Research. From Website:  
[www.chadd.org/whatsnew/FDAHearings.htm](http://www.chadd.org/whatsnew/FDAHearings.htm)

# ***Warning: Stimulants & AD/HD***

- According to the Center for Disease Control (CDC) about 2,500,000 children between 4 and 17 take AD/HD medications.
- “According to the Surgeon General, medication is effective for about 80 percent of the people who have the disorder.” (sic. AD/HD)

Goodman, B. (2/23/2006). FDA Warning on AD/HD Medications “Premature”;  
National AD/HD Advocacy Group Urges Further Research. From Website:  
[www.chadd.org/whatsnew/FDAHearings.htm](http://www.chadd.org/whatsnew/FDAHearings.htm)

# ***Warning: Cylert & AD/HD***

- Cylert (Pemoline) has a low abuse potential, but may cause liver toxicity. Must check liver enzymes every two weeks.
- It now has a PDR Black Box Warning.

Prince, J., and Wilens, T. (2002). Medications Used in the Treatment of AD/HD in Women. In P.O. Quinn, and K.G. Nadeau (Eds.), Gender Issues and AD/HD. Silver Spring, MD: Advantage, pp. 144-182.

Hallowell, E.M., and Ratey, J.J. (2005). Delivered From Distraction. New York, NY: Ballantine, pp. 251.

Connor, D. (2006). Stimulants (Chapter 17), In R.A., Barkley, Ed, Attention-Deficit Hyperactivity Disorder, Third Edition. New York, NY: Guilford, p. 636.

# ***Warning: Strattera and AD/HD***

- PDR Warning about liver problems. Two people have had liver function problems who have been placed on this medication.

Surman, C. (May 12, 2005). AD/HD and Comorbidity. Paper presented at the National Attention Deficit Disorder Association Annual Conference, May 12-15, 2005, Tucson, AZ.

Spencer, T.J. (2006). Antidepressant and Specific Norepinephrine Reuptake Inhibitor Treatments, Chapter 18, In R.A. Barkley, Ed., Attention-Deficit Hyperactivity Disorder. New York, NY: Guilford, p. 653.

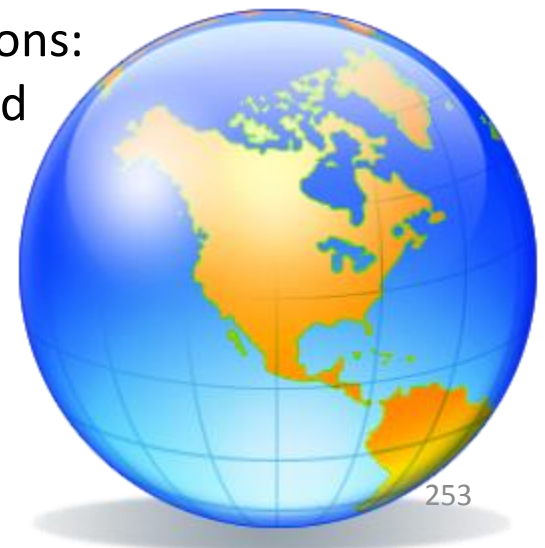


# ***POPULATIONS***

- World's projected population as of 01/01/07:  
**6,605,046,992** X 5 (Years)
- US Population as of 12/06/06: **300,351,641** X  
1 (Year)

From US Census Bureau World Population Clock Projections:

[www.census.gov/main/www/popclockworld.html](http://www.census.gov/main/www/popclockworld.html) and  
[www.census.gov/ipc/popclockworld.html](http://www.census.gov/ipc/popclockworld.html)



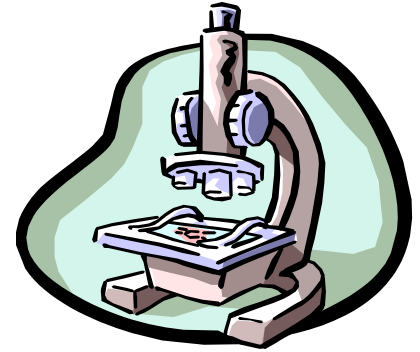
# ***“My daughter died after taking aspirin.”***

- “Health experts have issued a warning that children under the age of 19 should not take aspirin because the risk of a rare but potentially fatal condition called Reye’s Syndrome.”
- Each year there are an estimated 7600 deaths and 76,000 hospitalizations from taking non-steroidal anti-inflammatory drugs (NSAID). What is a NSAID? Aspirin!

BBC News World Edition (10/23/2002). “My Daughter Died After Taking Aspirin”. From website: [www.newsbbc.uk/2/hi/health/2353187.stm](http://www.newsbbc.uk/2/hi/health/2353187.stm)

From website: [www.drugwarfacts.org/causes.htm#nsaid](http://www.drugwarfacts.org/causes.htm#nsaid)

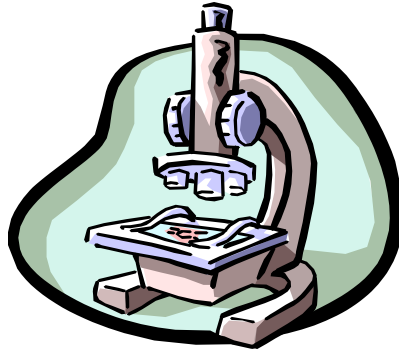
# The MTA Study



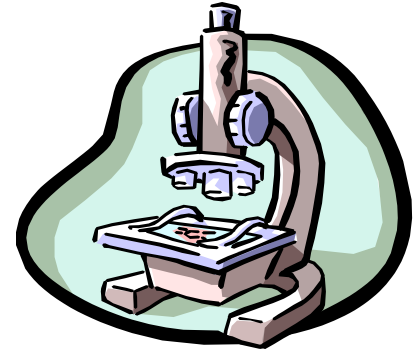
- Group 2: Behavior Modification
  - Parents taught how to use token economies at home and daily report cards, teachers taught how to teach AD/HD child, how to use token economies in the classroom, and daily report cards, AD/HD children were sent to special camp for AD/HD kids, parents and teachers given “800” number for consultation 24/7, continued on for 14 months!

# The MTA Study

- Group 3: “Experimental Medication Plus Behavior Modification Group”

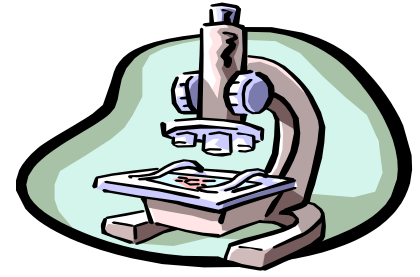


# The MTA Study



- Group 4: “Community Services”
  - The parents are told their child has Combined Type AD/HD and they are encouraged to go out to their community and get what services they want for their child...This was the “Control Group.”
    - Medication, aroma therapy, etc.

# MTA Study

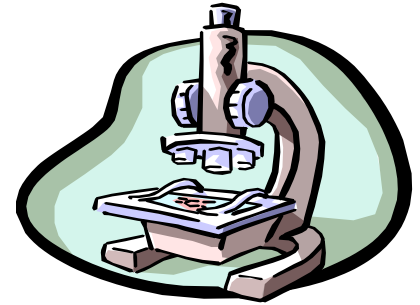


- Medication Management Treatment Group did best. 50% decline in symptoms.
- Medication with Behavioral Modification Group did no better.
- Behavior Modification Group did better than placebo.
- Community Treatment only had 25% decline in symptoms.
- Medication helps with social interaction.

**NIMH Research Treatment for Attention Deficit Hyperactivity Disorder (ADHD): The Multimodal Treatment Study – Questions and Answers. From website:**

[www.nimh.nih.gov/chilfhp/mt.aqu.cfm](http://www.nimh.nih.gov/chilfhp/mt.aqu.cfm)

# MTA Study



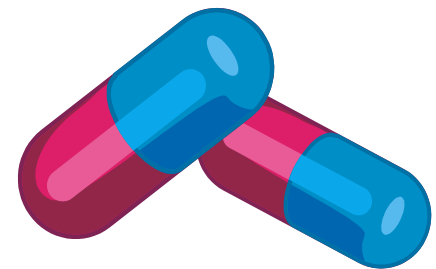
“In that study (MTA Cooperative Group, 1999) psychosocial treatment alone was very poor compared to medication effects and psychosocial treatment with methylphenidate was no better than methylphenidate alone...Medication was found to reduce negative social interactions both by the treated children and by their peers toward the child with ADHD”. (p. 55)

Semrud-Clickman, M. (2007). Social Competence in Children. New York, NY: Springer, p. 55.

## AD/HD Response Rate to Stimulant Titration

“If methylphenidate (sic., ritalin) is not effective or if there are side effects then the next alternative is dextroamphetamine (sic., dexedrine)...If the diagnosis has been appropriately made, the response rate is about 80% to 96%.”

Mahoney, W. (2002). The Use of Stimulant Medication in the Treatment of Attention Deficit Hyperactivity Disorder. Pediatrics & Child Health, 7 (1), pp. 693-696;  
From website: [www.ncbi.nlm.nih.gov/pmc/articles/PMC2796531](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2796531).





# MTA Study

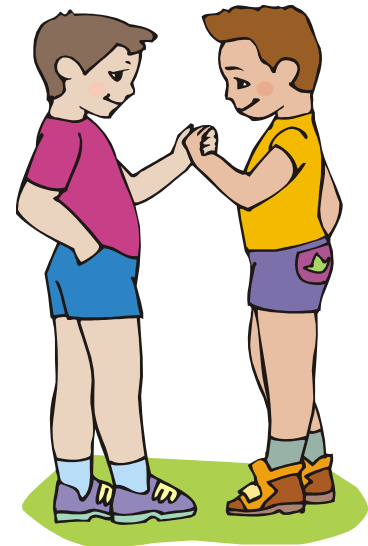
- “Based on these findings, we concluded that for AD/HD symptoms, a closely monitored medication approach of the MTA was superior to behavioral treatment alone and routine community treatment that included medication. Combined treatment offered slightly greater benefits than medication management alone for AD/HD symptom reduction as well as for other domains, such as peer relations, parent-child relations and academic outcomes.” (p. 64)
- Combined group used 20% less medication than Medication Only group.
- 24-month follow-up same basic results.

Jensen, P.S., Abikoff, H.B., Arnold, L.E., Epstein, J., Greehill, L.L., Hechtman, L., Hinshaw, S.P., March, J.S., Newcorn, J.H., Swanson, J.M., Vitello, B., Wells, K. and Wigal, T. (2006-2007). A 24-Month Follow-up to the NIMH MTA Study. The New CHADD Information and Resource Guide to AD/HD. Landover, MD: CHADD, pp. 64-67.

# Medication and Social Interaction

- “The medications used to treat AD/HD often have positive social effects; in fact most children feel an improvement in the way they relate to others.” (Aull, April, 2005, p. 36)

**Aull, E.B. (April, 2005). Social Skills Improvement with AD/HD Medication. Attention!, 12 (2), pp. 34-37.**



# AD/HD and Medication

- “When the discussion is specifically reserved to symptom relief and impairment reduction for ADHD, this series of articles adds to an impressive body of scientific literature demonstrating that medication treatment, in the case of methylphenidate, is cost efficient and may be all that is needed for good responders.” (p. 3)

**Goldstein, S. (December, 2004). Do Children with ADHD Benefit from Psychosocial Intervention, ADHD Report, 12 (6), 1-3.**

# Diagnosing Adult AD/HD

- The AD/HD diagnostic criterion in DSM-IV, TR were established from a field trial study of individuals ages 4 to 16. They do not apply to adults!
- Use 5 of 9 Hyperactive/Impulsive symptoms and 4 Inattentive symptoms for individuals 19 to 29 as cutoff.
- Use 4 of 9 for both (Hyperactive/Impulsive & Inattentive symptoms) for individuals over 29.

**Barkley, R.A. (2006). Attention Deficit Hyperactivity Disorder, Third Edition. New York, NY: Guilford, p. 88-89.**

# *Adult AD/HD in DSM-V*

1. “Is often easily distracted by extraneous stimuli
2. Often makes decisions impulsively
3. Often has difficulty stopping activities or behavior when he/she should do so
4. Often starts a project or task without reading or listening to directions carefully
5. Often shows poor follow-through on promises or commitments made to others
6. Often has trouble doing things in their proper order or sequence...”

## *Adult AD/HD in DSM-V*

7. Often more likely to drive a motor vehicle much faster than others
8. Often has difficulty sustaining attention in tasks or leisure activities
9. Often has difficulty organizing tasks and activities” (p. 10)

Cutoff: 6 of 9; in two settings; onset before age 16

**Barkley, R.A. and Murphy, K.R. (August 2006). Identifying New Symptoms for Diagnosing ADHD in Adulthood. ADHD Report, 14 (4), 7-11.**

**Barkley, R.A. Murphy, K.R. and Fischer, M. (2008). ADHD in Adults: What The Science Says. New York, NY: Guilford, p. 437.**

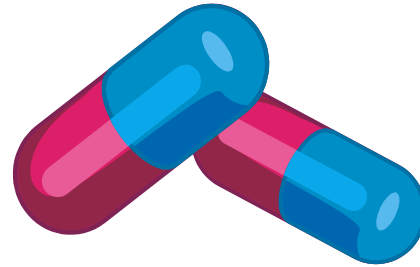
# ADULT AD/HD & TREATMENT

- Cognitive Behavioral Therapy works with AD/HD adults because they have better developed frontal lobes than children. They still need medication, however.
- This means adults with AD/HD can get some good out of social skills training whereas AD/HD children typically do not.

Barkley, R.A. (2006). Attention-Deficit Hyperactivity Disorder, Third Edition. New York, NY: Guilford.

Ramsay, R. J. (2010). Non-Medication Treatments for Adult ADHD. Washington, DC: American Psychological Association.

# Treatment of AD/HD Across the Age Span



1. Diagnosis
2. Psychoeducation about AD/HD
3. Medication
4. Accommodation

**Barkley, R. A. (1998). ADHD in Children, Adolescents, and Adults: Diagnosis, Assessment, and Treatment. New England Educational Institute Cape Cod Symposia, August, Pittsfield, MA.**

**Barkley, R.A. (2006). Attention-Deficit Hyperactivity Disorder. New York, NY: Guilford, p. 6**



# ***Possible Alternative Medicine Treatment for Combined Type AD/HD***



- Working Memory Training:
  - Torkel Klingberg, M.D., Ph.D.
  - Karolinska Institute- Stockholm, Sweden
  - CogMed software company
  - AD/HD deficient in visual spatial working memory. Gets worse with age.
  - **MAY** help relieve executive functioning difficulties in Combined Type AD/HD.
  - ***More Research is needed!***

Klingberg, T. (February, 2006). Training Working Memory. AD/HD Report, 14 (1), pp. 6-8.

Barkley, R. (February, 2006). Editorial Commentary Issues in Working Memory Training in ADHD. ADHD Report, 14 (1), pp. 9-11.

Ingersoll, B. (October 26, 2006). Complementary Treatments for AD/HD. Paper Presented at the 18<sup>th</sup> Annual CHADD International Conference, Chicago, IL.

# Treatments For Memory Disorders (Research-15 to 20)

- Mnemonics-memory tricks
- Diaries and Social Statements
- Technology-Watchminder watch, etc.-  
[www.addwarehouse.com](http://www.addwarehouse.com)
- Nootropic Medications



Nosek, K. (1997). Dyslexia in Adults: Taking Charge of Your Life. Dallas, TX: Taylor.

Smith, L. and Godfrey, H.D.P. (1995). Family Support Programs Rehabilitation: A Cognitive-Behavioral Approach to Traumatic Brain Injury. New York, NY: Plenum.

Barkley, R.A. (1998). Attention Deficit Hyperactivity Disorder (Second Edition). New York, NY: Guilford.

Goldstein, S. and Goldstein, M. (1997). Drugs Affecting Learning, Attention, and Memory. In S. Goldstein (Ed.), Managing Attention and Learning in Late Adolescence & Adulthood: A Guide for Practitioners. New York, NY: John Wiley & Sons, pp. 327-373.

# Professionals Who Can Help with Memory

- AD/HD Coaches: [www.addbrain.com](http://www.addbrain.com)
- Professional Organizers: [www.napo.net](http://www.napo.net)
- Psychiatrists: [www.apa@psych.org](mailto:www.apa@psych.org)
- Psychologists: [www.apa.org](http://www.apa.org)
- Masters Level Counselors: [www.nbcc.org](http://www.nbcc.org)
- Social Workers: [www.naswdc.org](http://www.naswdc.org)
- Behavioral Neurologists: [www.anpaonline.org](http://www.anpaonline.org)
- Speech-Language Pathologists:  
[www.professional.asha.org](http://www.professional.asha.org)
- Association for Persons in Supported Employment (APSE): [www.apse.org](http://www.apse.org)

# *Workplace Accommodations*

Job Accommodations Network

P. O. Box 6080

Morgantown, WV 26506-6080

Voice/TTY (in US): 1-800-526-7234

Voice/TTY (Worldwide): 1-304-293-7186

Fax: 1-304-293-5407

Web: [www.askjan.org](http://www.askjan.org)

# Visual Spatial Processing Disorders



# DSM-5 & ASD



- Types of High Functioning  
Autism, Autism, Nonverbal LD, Asperger's  
Disorder, PDD, PDD, NOS:

## 1. Autism Spectrum Disorder

Author (2010). Asperger's Disorder. Washington, DC: American Psychiatric Association;

[www.dsm5.org/Proposed/Revisions/Pages/proposedrevision.aspx?rid=97#](http://www.dsm5.org/Proposed/Revisions/Pages/proposedrevision.aspx?rid=97#).

Author (2010). Autistic Disorder. Washington, DC: American Psychiatric Association;

[www.dsm5.org/Proposed/Revisions/Pages/proposedresisions.aspx?rid=94](http://www.dsm5.org/Proposed/Revisions/Pages/proposedresisions.aspx?rid=94).

# Visual-Spatial Problems



- “Spatial relations include qualities like size, distance, volume, order and time.” (p.1)
- There are two types of spatial skills. Visual-spatial performance refers to using sight to discriminate differences. Motor-spatial performance refers to making the body move accurately and smoothly. Of course, many activities demand some combination of the visual-spatial and motor-spatial skill.” (p. 5)

Stockdale, C. & Possin, C. (2001). Spatial Relations and Learning. Website: [www.Newhorizons.org/spneeds-arkspatial.html](http://www.Newhorizons.org/spneeds-arkspatial.html) , pp.1-24.

# Visual-Spatial Problems



- Difficulties with temporal and spatial relationships are related to problems in the right hemisphere. People with such difficulties have problems with processing information that is nonverbal in nature.

Berg, M. & Stockdale, C. (2001). The Language of Space and Time. Paper presented at the 52<sup>nd</sup> International Dyslexia Association International Conference, Albuquerque, NM, October 24-27, 2001. Convention Recordings, Inc. – [www.conventionrecordings.com](http://www.conventionrecordings.com); St. Petersburg, FL, Session S-168.



# Social Competence Intervention Program (SCIP) (**RESEARCH-21**)

“SCIP is an intervention that is multi-sensory in nature and targets underlying difficulties in social perception as well as providing exercises to improve the generating of strategies for problem solving”. (p. 104)

Semrud-Clickman, M. (2007). Social Competence in Children. New York, NY: Springer, p. 104.

# DIR/Floortime

## (RESEARCH-22 to 24)

- DIR: Developmental Individual Difference
- “...is a framework that helps clinicians, parents and educators conduct a comprehensive program tailored to the unique challenges and strengths of children with Autism Spectrum Disorders (ASD) and other developmental challenges.”

Interdisciplinary Counsel on Developmental and Learning Disorders (ICDL)  
(8/11/2010). What is dir/floortime?.

[www.icdl.com/dirFloortime/overview/index.shtml/](http://www.icdl.com/dirFloortime/overview/index.shtml/)

# Applied Behavior Analysis

## (RESEARCH-25)

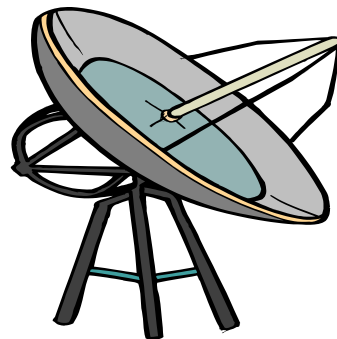
*“Applied behavior analysis(ABA) is a discipline concerned with the application of behavioral science in real-world settings such as clinics or schools with the aim of addressing socially important issues such as behavior problems and learning...Features common to all ABA-based approaches are objective measurement of behavior, precise control of the environment and use of procedures based on scientifically established principals of behavior...”*

# Applied Behavior Analysis

“...Any clinical procedure or research investigation adhering to these basic criteria can be considered to be an ABA-based procedure. This includes ‘functional behavioral assessment’ and approaches such as ‘Positive Behavioral Support’ and forms of ‘Behavior Therapy’ that rely on direct observation of behavior and analysis of behavior environment relations.”

Hagopian, L.P., and Boelter, E.W. (8/27/2010). Applied Behavior Analysis and Neurodevelopmental Disorders: Overview and Summary of Scientific Support. Kennedy Krieger Institute: [www.kennedykrieger.org/kki\\_misc.jsp?pid=4761](http://www.kennedykrieger.org/kki_misc.jsp?pid=4761)

# Auditory NVLD?



- Bellis (2002) wrote about how a person with NVLD may experience a subtype of Central Auditory Processing Disorder (CAPD) which causes problems in processing tone of voice and paralinguistics and not the discrimination of speech sounds. This is also a right hemisphere problem.

**Bellis, T.J. (2002). When The Brain Can't Hear: Unraveling The Mystery of Auditory Processing Disorder. New York, NY: Atria.**

# ***Visual-Spatial Working Memory and Combined Type AD/HD***



- Those with Combined type AD/HD have a significant problem with Visual-Spatial Working Memory.
- The RM program may help in improving visual-spatial working memory: [www.cogmed.com](http://www.cogmed.com)
- Medication may, too.

Klingberg, T., Fernell, E., Olesen, P.J., Gustafsson, P., Dalstrom, K., Gillberg, C., Fossberg, H. Westerberg, H. (2005). Computerized Training of Working Memory In Children With ADHD – A Randomized, Controlled Trial. Journal of The American Academy of Child and Adolescent Psychiatry, **44** , 177-186.

Gibson, B.S., Seroczynski, A., Gondoli, D.M., Braungart-Rieker, J. and Grundy, A.M. (In Press). Working Memory Training for Early Adolescents with Attention-Deficit Hyperactivity Disorders. Study conducted at the University of Notre Dame.

Barkley, R.A. (2006). Attention-Deficit Hyperactivity Disorder, 3<sup>rd</sup> Edition. New York: Guilford.

## ***Strabismus and Combined Type AD/HD***

- Convergent Insuficiency = Lack of coordination between the eye muscles
- 2% to 8% of the population has strabismus.
- Rate 3 times higher in those with AD/HD Combined Type
- Symptoms: Trouble with near work, headaches, “swimming words”
- Treatment: At home eye exercises
- Neuro-Ophthalmologists (M.D./D.O.): [www.anpaonline.org](http://www.anpaonline.org)
- Behavioral Optometrists [www.optometrist.org](http://www.optometrist.org)
- ***NOTE: This does NOT cure AD/HD!***

Ingersoll, B. (October 26, 2006). Complementary Treatments for AD/HD.  
Paper presented at the 18<sup>th</sup> Annual CHADD International Conference,  
Chicago, IL.

Granet, D. (2005) Strabismus.

David Granet – National Eye Institute of National Institutes of Health



# ***Prosopagnosia of Facial Expressions***





# Prosopagnosia of Facial Expressions



“Face perception can be subdivided into two general types – recognition of person identity via the structures of the face and recognition of internal affective state based on the shape of individual features and changes in their relative distance from one another during the expression.” (p. 128)

Schultz, R.T. (2005). Developmental Deficits in Social Perception in Autism: The Role of the Amygdala and Fusiform Face Area. International Journal of Developmental Neuroscience, 23, 125-141.

# Recognizing Emotional Facial Expressions



- Emotional Facial Expression Recognition:
  - “Does this mean we come into the world expecting to see human faces and ready to respond with our own prewired facial expressions”? Yes!” (Ratey, 2001, p. 300)

**Ratey, J. J. (2001). A User's Guide to the Brain: Perception, Attention, and the Four Theaters of the Brain. New York: NY: Vintage.**

# Children and Facial Expressions



“An early skill that has been found to be important for the development of additional social ability is the ability to understand and recognize facial expressions appropriately. These expressions allow the child to understand the other’s mood reaction to their behavior and adapt accordingly...These skills develop early and have been found already present in the preschool years.” (p. 7)

Semrud-Clickman, M. (2007). Social Competence in Children. New York, NY: Springer, p. 76.

# Facial Expressions



- Remembering Expressions:
  - The non-disabled are “pre-wired” to find the human face and voice the most important stimuli in the world.
  - Those with Autism cannot generalize what they learn (imitation/mimic). They copy behavior.
  - Those with Asperger’s Disorder (AD) don’t look at the eyes they look at the mouth. Differentiated those with AD from non-disabled 100% of the time.

Klin, A. (October 11-12, 2001). Autism, Asperger’s and the PDD Spectrum. Seminar presented at the 33<sup>rd</sup> Annual Arizona Association of School Psychologists Conference, Mesa, AZ.

Volkmar, F.(April 23, 2003). Asperger Syndrome: Clinical Features, Assessment, and Intervention Guidelines. Seminar presented by New England Educational Institute, Phoenix, AZ

# Genetics and Facial Expressions



- People born blind and who have never seen facial expressions make them accurately.
- They follow unique genetic family facial expression signatures.
- Their mirror neurons work, too.

**Peleg, G., Katzir, G., Peleg, O., Kamara, M., Brodsky, L., Hel-Or, H., Keren, D. and Nevo, E. (October 26, 2006). Hereditary family signature of facial expression. Proceedings of the National Academy of Sciences of the United States of America, 103 (43), PP. 15921-15926.**

**Ricciardi, E., Bonino, D., Sani, L., Vecchi, V., Guazzelli, M., Haxby, J.V., Fadiga, L. and Pietrini, P. (August 5, 2009). Do We Really Need Vision? How Blind People “See” The Actions of Others. Journal of Neuroscience, 29 (31), pp. 9719-9724.**

# Prosopagnosia and Autism Spectrum Disorders



“Thus, these data argue for the role of the FFA-amygdala system in social cognition more generally, and retrieval of specific social knowledge about what constitutes a friendly social interaction, or not. Collectively these data suggest the amygdala-FFA system and its failure to strongly activate during face perception tasks points to a causal mechanism involved in autism...” (p. 137)

**Schultz, R.T. (2005). Developmental Deficits in Social Perception in Autism: The Role of the Amygdala and Fusiform Face Area. International Journal of Developmental Neuroscience, 23, 125-141.**

# ***Decoding Skill and Facial Expression***

- Positive emotions are the easiest to decode.
- Negative emotions are the most difficult.
- Poor interpreters of facial expression have less social acceptance and poorer adjustment.



**Semrud-Clikeman, M. (Spring, 2003). Executive Function and Social Communication Disorders. Perspectives, 29 (2), p. 20-22.**

**Semrud-Clikeman, M. (2007). Social Competence in Children. New York, NY: Springer.**

# Decoding Skill and Facial Expression



- Most and Greenbank (2000) stated LD children are less accurate in identifying emotional expressions than non-LD children.
- Brown (2001) indicated AD/HD children are less accurate in facial expression identification than their non-AD/HD peers.
- Attwood (2007) stated those with Asperger's Disorder have great difficulty decoding faces.

**Most, T. and Greenbank, A. (2000). Auditory, Visual and Auditory—Visual Perception of Emotions by Adolescents With and Without Learning Disabilities, and their Relationship to Social Skills. Journal of Learning Disabilities, 15 (4), pp. 171-178.**

**Brown, T. E. (2001). Social Ineptness & “Emotional Intelligence” in ADHD. Paper presented at the 13<sup>th</sup> Annual Children and Adults With Attention Deficit Disorders International Conference, October 18-20 2001, Anaheim , CA.**

**Attwood, T. (2007). The Complete Guide to Asperger's Syndrome. Philadelphia, PA: Jessica Kingsley, p. 130.**



# Problems Making the Appropriate Facial Expression to Match How One Feels and What is Appropriate to The Situation

- Unmedicated AD/HD, Combined Type people have difficulty making facial expressions to match how they feel. They tend to “over-emote” their facial expressions. (Kuehle, et.al., 2002).
- Attwood’s (2007) story of the boy with Asperger’s Disorder who saw his mother crying and asked, “What face do I make?” (p. 134)

Kuehle, H.J., Hoch, C. and Jansen, F. (2002). Video Assisted Observation of Visual Attention, Facial Expression of the Individual, Stimulant Dosage and Motor Behavior for the Diagnosis and for the Determination in Children with AD/HD. Obtained from: Kuehle, H. (October 17, 2002). Video Assisted Observation of Visual Attention and Motor Behavior for the Diagnosis and Determination of the Individual Stimulant Dosage in Children with AD/HD. Research Poster Session, 14<sup>th</sup> Annual CHADD International Conference, Miami Beach, FL.

Attwood, T. (2007). The Complete Guide to Asperger’s Syndrome. Philadelphia, PA: Jessica Kingsley, p. 135.

# ***Assessment for Face Perception***

## ***Simon Baron-Cohen's Tests:***

- **Faces Test**
- **Eyes Test (Adult)**
- **Eyes Test (Child)**
- **Cambridge Mindreading (CAM) Face-Voice Battery**
- **Empathy Quotient (EQ) (Adult)**
- **Empathy/Systemizing (EQ-SQ) (Child)**
- **And many others...**

**Downloadable from:**

**[www.autismresearchcentre.com/tests/default.asp](http://www.autismresearchcentre.com/tests/default.asp)**

# ***FACE READING ASSESSMENT***

- **Comprehensive Affect Testing System (CATS)**

“This ensemble of tests enables clinical psychologists, neuropsychologists, neurologists, educators, speech therapists and other related disciplines to assess dysfunctional processing of affect expressed by the human face and voice.” (p. 1 of 4)

Froming, K., Levy, M. and Ekman, P. (2003).

[www.psychologysoftware.com/CATS.html](http://www.psychologysoftware.com/CATS.html).

# ***Treating Problems Reading Facial Expressions***

- Volkmar, F. (April 23, 2003). Asperger Syndrome: Clinical Features, Assessment, and Intervention Guidelines. Seminar presented by the New England Educational Institute, Phoenix, AZ.
- Gauthier, I. and Tarr, M.J. (1997). Becoming a “Greeble” Expert: Exploring Mechanisms for Face Recognition. Vision Research, 37 (12), 1673-1682.

## • ***FACIAL EXPRESSIONS CAN BE TAUGHT!***



# *Computer Programs to Treat Prosopagnosia* **(RESEARCH-26 to 27)**



- Baron-Cohen, S. (2003). Mind Reading: An Interactive Guide To Emotions. Philadelphia, PA: Jessica Kingsley.  
“Harry Potter” teaches facial expressions.
- Baron-Cohen, S., Drori, J., Harcup, C. (2009). The Transporters (USA Version). London, England: Changing Media Development:  
[www.thetransporter.com](http://www.thetransporter.com)  
“Thomas the Tank-Engine” teaches faces.

# ***Computer Programs to Treat Prosopagnosia***



- “Gaining Face”: [www.ccoder.com/GainingFace](http://www.ccoder.com/GainingFace)
- Paul Ekman, Ph.D. (**“Lie to Me”**/SPOT – Surveying Passengers by Observational Techniques) CD ROMS:  
Micro Expression Training Tool (METT)  
Subtle Expression Training Tool (SETT)  
Repeated presentations of METT & SETT to those with Autism Spectrum Disorders  
Available from: [www.paulekman.com](http://www.paulekman.com)

# ***Treating Problems Making & Reading Facial Expressions***

- Cognitive Affective Training-Faces and Feeling Words: [www.CAT-kit.com](http://www.CAT-kit.com)
- Student Handout: Emotions and Facial Expressions – From: McAfee, J. (2002). Navigating the Social World. Arlington, TX: Future Horizons, pp 83-84.
- Ekman, P., & Friesen, W.M. (2003). Unmasking The Face: A Guide To Recognizing Emotions From Facial Cues. Cambridge, MA: Malor Books.
- Ekman, P. (2003). Emotions Revealed: Recognizing Faces and Feelings to Improve Communication and Emotional Life. New York, NY: Time Books.



# Facial Expression Training & Autism



- “Even when people with autism spectrum disorders can figure out what someone’s eyes or face conveys, they do so in a different way than everyone else, which may be less efficient or take more time.” (p. 62)
- The non-disabled use the temporal lobe and fusiform gyrus to decode facial expressions.

Ozonoff, S., Dawson, G. and McPartland, J. (2002). A Parent’s Guide to Asperger Syndrome and High – Functioning Autism. New York, NY: Guilford.



# *Facial Expression Training & Autism*

- Looking at pictures of eyes and deciphering the emotion they conveyed activated the non-disabled amygdalas and frontal lobes.
- Those with Asperger's used the frontal lobes far less and did not activate the amygdala. They used other areas of the brain not designed for such tasks.
- Those with Asperger's may use voice, touch, etc. to recognize others, not their face.

Ozonoff, S., Dawson, G. and McPartland, J. (2002). A Parent's Guide to Asperger Syndrome and High – Functioning Autism. New York, NY: Guilford.



# *ASD and Facial Expression Recognition*

- Social Skills training by Mental Health Professionals and Speech-Language Pathologists
- 9/11 & Future Prosthetic Devices (Azar, 2000)
- Try an “Emotional Seeing Eye Dog” (Grandin, 1995)

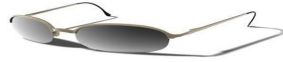


Azar, B. (2000). Two Computer Programs Face Off. Monitor on Psychology, 31 (1), pp. 48-49.

Grandin, T. (1995). Thinking in Pictures: And Other Reports From My Life with Autism. New York, NY: Vintage.

Grandin, T. (2006). Animals in Translation. New York, NY: Simon and Schuster.

# *ASD Wearable Prosthetic*



“We describe a novel wearable device that perceives and reports on social-emotional information in real-time human interaction. Using a wearable camera, combined with machine perception algorithms, the system records and analyzes the facial expressions and head movements of the person with whom the wearer is interacting. We propose the application of the social-emotional prosthetic to assist the growing number of individuals diagnosed with Autism...”

# *ASD Wearable Prosthetic* **(RESEARCH-28)**



“...Spectrum Disorder (ASD) in perceiving communication in a natural rather than a structured environment, bootstrapping their ability to learn and develop in social settings...” (p. 1)

El Kaliouby, R., Teeters, A. and Picard, R.W. (MIT Media Lab) (No Date). An Exploratory Social-Emotional Prosthetic for Autism Spectrum Disorders. From website: [www.affect.media.mit.edu/pdfs/06.kaliouby-teeters-picard-bsn.pdf](http://www.affect.media.mit.edu/pdfs/06.kaliouby-teeters-picard-bsn.pdf) . More information from: kaliouby,alea,picard@media.mit.edu

# *Emotional Seeing Eye Dogs*

- Dogs separated from wolves about 135,000 years ago.
- Dogs lived with humans 100,000 years ago; even before we were “modern humans” (Homo Habilis).
- Dog and humans co-evolved.
- Humans learned to think and act like dogs.
- Dogs allowed humans to hunt big game while they acted as guards and lookouts. Humans did more planning and organization activities.
- 14,000 years ago humans domesticated dogs.
- Homo Sapien Neantathalensis did not have dogs; they are extinct.
- In the past 100,000 years dogs brains shrunk by 10 to 30%; mostly in their forebrains. Humans’ brains shrank by 10%; mostly in the midbrain, sensory and smell areas.
- Dogs have a symbiotic relationship with humans and have a genetic predisposition to understand human emotions.

Grandin, T. (2005). Animals in Translation. New York, NY: Simon & Schuster.

# *Emotional Seeing Eye Dogs*



- **4Paws For Ability**  
**253 Dayton Avenue**  
**Xenia, OH 45385**
- **Training Center:**  
**937-374-0385**
- **Website:**  
[www.4pawsforability.org](http://www.4pawsforability.org)

Dogs may have a rudimentary mirror neuron system!

Blakeslee, S. (January 10, 2006). Cells That Read Minds. New York Times; From website:  
[www.nytimes.com/2006/01/10/science/10mirr.html?pagewanted=1&r=1](http://www.nytimes.com/2006/01/10/science/10mirr.html?pagewanted=1&r=1).



# *AD/HD and Making Facial Expressions*



# *Facial Expression and Social Ability*



- Regarding facial expressions in children and adults with AD/HD Kuhle, Hoch, Rautzenberg and Jansen (2001) concluded, “Altogether, ... the facial expressions, are uncontrolled and jerky and are often wrongly dimensioned in time and space.” (p. 6)

**Kuhle, H.J., Hoch, C., Rautzenberg, P. and Jansen, F. (2001). Short-Term Video-Based Observation of Behavior with Special Reference to Eye-Contact, Facial Expression and Motor Activity in Diagnosis and Therapy of Attention Deficiency/ Hyperactivity Syndrome (ADHS). (First Published in): Praxis der Kinderpsychologie und Kinderpsychiatrie 50: 607-621. Obtained from: Kuehle, H. (October 17, 2002). Video Assisted Observation of Visual Attention and Motor Behavior for the Diagnosis and Determination of the Individual Stimulant Dosage in Children with AD/HD. Research Poster Session, 14<sup>th</sup> Annual CHADD International Conference, Miami Beach, FL.**



# Facial Expressions and AD/HD



- AD/HD childrens' eyes drift away from those they are in conversation with.
- This usually interrupts the flow and their comprehension of the conversation.
- Often parents feel rejected by AD/HD children when they do this.

Kuehle, H.J., Hoch, C and Jansen, F. (2002). Video Assisted Observation of Visual Attention, Facial Expression of the Individual Stimulant Dosage and Motor Behavior for the Diagnosis and for the Determination in Children with AD/HD. Obtained from: Kuehle, H. (October 17, 2002). Video Assisted Observation of Visual Attention and Motor Behavior for the Diagnosis and Determination of the Individual Stimulant Dosage in Children with AD/HD. Research Poster Session, 14<sup>th</sup> Annual CHADD International Conference, Miami Beach, FL.

# Facial Expressions and AD/HD

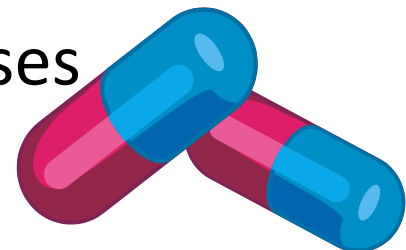


- AD/HD children smile abruptly.
- There is little or no transition between emotional states.
- Sometimes their facial expression bleeds over into the next emotional state.
- Expression of emotion often appears exaggerated. The quality of expression can be limited due to this.
- Even body movements are jerky and uncontrolled.

Kuehle, H.J., Hoch, C. and Jansen, F. (2002). Video Assisted Observation of Visual Attention, Facial Expression of the Individual Stimulant Dosage and Motor Behavior for the Diagnosis and for the Determination in Children with AD/HD. Obtained from: Kuehle, H. (October 17, 2002). Video Assisted Observation of Visual Attention and Motor Behavior for the Diagnosis and Determination of the Individual Stimulant Dosage in Children with AD/HD. Research Poster Session, 14<sup>th</sup> Annual CHADD International Conference, Miami Beach, FL.

# Possible Treatment of Problems with Facial Expression and AD/HD

- Optimal dosing of a stimulant medication causes a significant reduction in visual attention loss.
- Facial expressions ~~will~~ become smooth and variable.
- Too high a dose can cause a return of the symptoms.
- Can properly ID 80% of the AD/HD children with video procedure.



Kuhle, H.J., Hoch, C., Rautzenberg, P. and Jansen, F. (2001). Short-Term Video-Based Observation of Behavior with Special Reference to Eye-Contact, Facial Expression and Motor Activity in Diagnosis and Therapy of Attention Deficiency/ Hyperactivity Syndrome (ADHS). (First Published in): Praxis der Kinderpsychologie und Kinderpsychiatrie 50: 607-621. Obtained from: Kuehle, H. (October 17, 2002). Video Assisted Observation of Visual Attention and Motor Behavior for the Diagnosis and Determination of the Individual Stimulant Dosage in Children with AD/HD. Research Poster Session, 14<sup>th</sup> Annual CHADD International Conference, Miami Beach, FL.

# The “Resting Face”



- 75% of the population has an emotionally neutral face.
- 25% of the population have a resting face that is interpreted negatively.
- The older you are the more at risk you are for this.
- This can cause a very negative first impression.
- Some people resort to surgery to “correct” this (Bell’s Palsy, etc.).

Nowicki, S. and Duke, M. (2002). Will I Ever Fit In? New York, NY: Free Press.

# Golden Ratio

“...We found that although different faces have varying attractiveness, individual attractiveness is optimized when the face’s vertical distance between the eyes and mouth is approximately 36% of its length and the horizontal distance between the eyes is approximately 46% of the face’s width...” (p. 149)

**Pallett, P.M., Link, S., and Lee, K. (January 2010). New “Golden Ratios for Beauty. Vision Research, 50 (2), pp. 149-154.**

# ***Facial Symmetry and “Beauty”***

“Two prominently studied traits are symmetry and sexual dimorphism, which, for many animals, are proposed cues to heritable fitness benefits. These traits are associated with other potential benefits, such as fertility. In humans, the face has been extensively studied in terms of attractiveness. Faces have the potential to be advertisements of mate quality and both symmetry and sexual dimorphism have been linked to the attractiveness of human face shape”.

Little, A., Jones, B.C., Waite, C., Tiddeman, B.P., Fienberg, D.R., Perrett, D.I., Apicella, C.L., and Marlowe, F.W. (July 9, 2008). Symmetry Is Related to Sexual Dimorphism in Faces: Data Across Culture and Species, PLoS One, 3 (5): e2106.

# Flirting and Social Abilities



- "...a flirting plan is wired into us, and that it has been embedded in our genes and in our brain's operating system the same way and for the same reasons that every other sexual trait has been - by trial and error, with conservation of what works best." (Rodgers, 1999, p. 38)

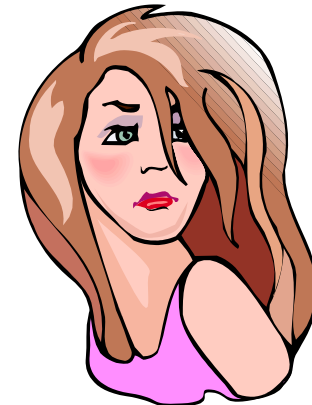
Rodgers, J.E. (February, 1999). Fascinating Flirting. Psychology Today, 32 (1), 36-41, 64-65, 67, 69-70

# Flirting and Social Abilities



- “Enter creativity, humor and intelligence. Deployed in flirting they disclose more about an individual person than all the antlers do about leaching animals...They act as an honest signal that we’ve got a reasonably well put together nervous system.” (p. 70)

Rodgers, J.E. (February, 1999). Fascinating Flirting. Psychology Today, 32 (1), 36-41, 64-65, 67, 69-70.



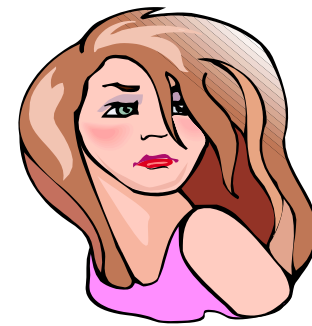


# Flirting and Social Abilities

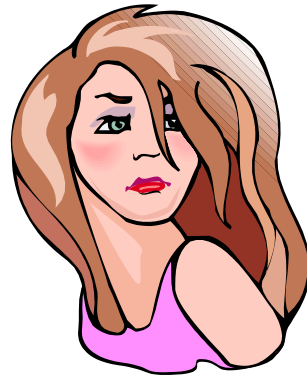


- “The moment of attraction, in fact, mimics a kind of brain damage...In attraction, we don’t stop and think, we react, operating on a ‘gut’ feeling, with butterflies, giddiness, sweaty palms and and flushed faces brought on by the reactivity of the emotional brain. We suspend intellect at least long enough to propel us to the next step in the mating game-flirtation.” (p.5)

Ellison-Rogers, J. (January/February, 1999). Flirtation Fascination. Psychology Today, (Document ID: 575),  
From website: [www.psychologytoday.com/articles/index.php?term+pto19990101-000033&print=1](http://www.psychologytoday.com/articles/index.php?term+pto19990101-000033&print=1) .



# Flirting and Social Abilities



- It takes about seven seconds to form a first opinion about another person. Most of this is done non-verbally.

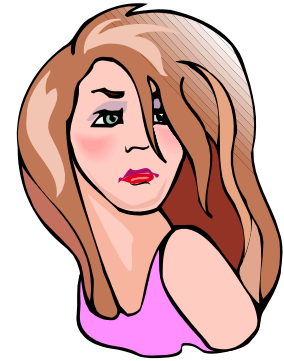
Nowicki, S. and Duke, M. (2002). Will I Ever Fit In? New York, NY: Free Press.

- Mating and relationships would be almost impossible without facial expressions.

Gladwell, M. (August 5, 2002). The Naked Face (Interview of Paul Ekman). The New Yorker, pp. 36-49.



# Flirting and Social Abilities



- Attwood's (1998) story of the man with Asperger's Disorder in a singles bar.
- Cordoni stated you need the same behaviors to get a job as you need to get a date.

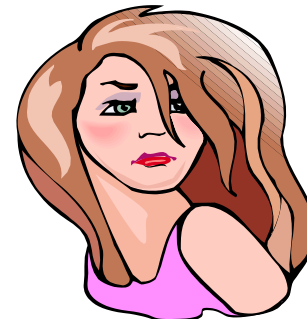
Attwood, T. (1998). Asperger's Syndrome: A Guide for Parents and Professionals. Philadelphia, PA: Jessica Kingsley.

Cordoni, B. (1987). Living With A Learning Disability. Carbondale, IL: Southern Illinois University Press.

# *Flirting and Social Abilities*



“Over the course of our evolution as a species, our brains have learned how to spot the healthiest mates, those who are likely to give us children, and those whose resources and commitment can help our offspring survive.”  
(p. 60)



Brizendine, L. (2006). The Female Brain. New York, NY: Morgan Road.

# ***Chips and Polio***



“Finally, there are the rarely observed instances of shunning a group member whose behavior seems abnormal – the social rejection of Pepe and Old Mr. McGregor after they suffered polio.” (P. 227)

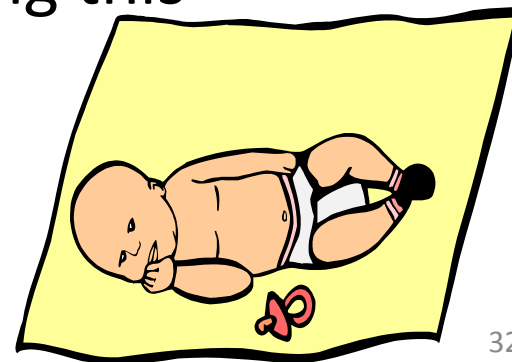
Goodall, J. (1986). Social Rejection, Exclusion and Shunning Among Gombe Chimpanzees. *Ethnology and Sociobiology*, 7, pp. 227-239. From Website:  
<http://www.bepress.com/context/gruterclassics/article/1032/viewcontent/>.

## *But, What About Culture?*

- “When Pat went to Japan to test adults on the American *r* and *l* sounds, she also tested babies. Japanese and American seven-month-olds discriminated *r* from *l* equally well. But just three months later, the two groups were as different as night from day. At ten months, Japanese infants could no longer hear the change from *r* to *l*. American infants not only could do so but had actually gotten much better at making this distinction.” (p.107)

Gopnik, A., Meltzoff, A.N. and Kuhl, P.K. (1999).

The Scientist In The Crib. New York, NY: HarperCollins, p. 107



## *But, What About Culture?*

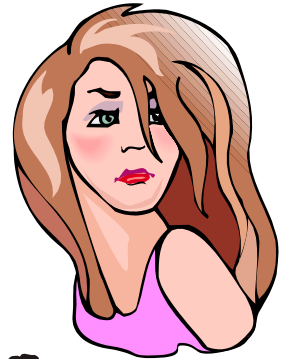
- “Like imitation, baby flirtation suggests that babies not only know people when they see them but also that they are connected to people in a special way. Like grown-up flirtation, baby flirtation bypasses language and establishes a more direct link between people (p. 31).

Gopnik, A., Meltzoff, A.N., and Kuhl, P.K. (1999). The Scientist In The Crib. New York, NY: HarperCollins, p. 31



# How to Treat Flirting Difficulties

- Social Skills training by Mental Health Professionals and Speech-Language Pathologists
- Treat Neurosocial Comorbidities
- 9/11 & Future Prosthetic Devices (Azar, 2000)
- Try an “Emotional Seeing Eye Dog” (Grandin, 1995)



Azar, B. (2000). Two Computer Programs Face Off. Monitor on Psychology, 31 (1), pp. 48-49.

Grandin, T. (1995). Thinking in Pictures: And Other Reports From My Life with Autism. New York, NY: Vintage.

Grandin, T. (2006). Animals in Translation. New York, NY: Simon and Schuster.



# Treatment of Visual-Spatial Processing Disorders



- “When Britt could talk through the task, she was successful even with space and time...Verbally mediated. Yes! Britt was at a loss when she could not talk her way through space and time tasks. That must be a key!” (Stockdale; From: Neff, Lippman-Neff and Stockdale, 2002, p. 54)

**Neff, B., Neff-Lippman, J. and Stockdale, C. (2002). The Source for Visual-Spatial Disorders. East Moline, IL: LinguSystems.**

# ARK Foundation's Learning Window

Neff, B., Neff-Lippman, J. and Stockdale, C. (2002). The Source for Visual-Spatial Disorders. East Moline, IL: LinguiSystems, p. 176.

ARK Institute of Learning:

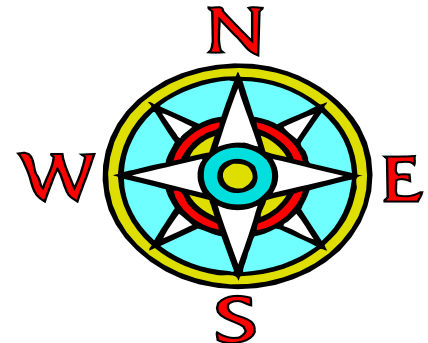
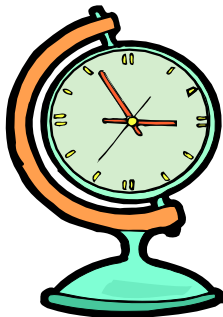
[www.arkinst.org](http://www.arkinst.org)



# NVLD/Asperger's Suggestions

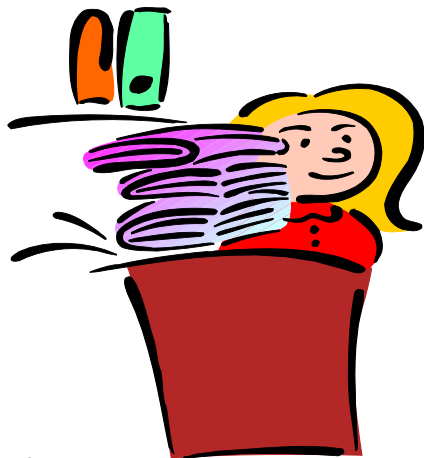
- “Children with temporal and spatial problems need to be taught the language of time and space, syntax, the vocabulary of position and direction, map and clock reading.”

Berg, M. & Stockdale, C. (2001). The Language of Space and Time. Paper presented at the 52<sup>nd</sup> International Dyslexia Association International Conference, Albuquerque, NM, October 24-27, 2001. Convention Recordings, Inc. – [www.conventionrecordings.com](http://www.conventionrecordings.com); St. Petersburg, FL, Session S-168.



# Excellent Resource on NVLD Treatment

- Neff, B., Neff-Lippman, J. and Stockdale, C. (2002). The Source for Visual-Spatial Disorders. East Moline, IL: LinguiSystems.



# ***How to Help the NVLD Child in the Classroom***

- For the student who gets lost on the way to the classroom and is tardy:
  - Provide a verbal and visual map of the school
  - Assign a student to be their helper
  - Train the helper to look out for the schoolmate
  - Eliminate detention for tardiness for student for a period of time
  - Practice going from class to class and provide verbal landmarks.

**Thompson, S. (1996). Neurobehavioral Characteristics Seen in the Classroom: Developing an Educational Plan for the Student with NLD. From NLD on the Web: [www.nldontheweb.org/thompson-5.htm](http://www.nldontheweb.org/thompson-5.htm) .**

# ***How to Help the NVLD Child in the Classroom***

- Problems with transitions and routine changes:
  - Provide a predictable, safe, consistent classroom routine
  - Minimize transitions and give several verbal warnings before transition
  - Furnish the student a written schedule of their day so they can prepare for it the night before
  - Provide landmarks.

Thompson, S. (1996). Neurobehavioral Characteristics Seen in the Classroom: Developing an Educational Plan for the Student with NLD. From NLD on the Web: [www.nldontheweb.org/thompson-5.htm](http://www.nldontheweb.org/thompson-5.htm) .

# ***How to Help the NVLD Child in the Classroom***

- Has difficulty generalizing previously learned knowledge:
  - Never expect the student has automatically generalized concepts
  - Use language as a bridge to tie new situations to old learning
  - Review past learning and tie it to new learning; point out connections, comparisons and contrasts
  - Methodically discuss cause-and-effect relationships with student

Thompson, S. (1996). Neurobehavioral Characteristics Seen in the Classroom: Developing an Educational Plan for the Student with NLD. From NLD on the Web: [www.nldontheweb.org/thompson-5.htm](http://www.nldontheweb.org/thompson-5.htm) .

# ***How to Help the NVLD Child in the Classroom***

- Difficulty remembering multi-step directions:
  - Write out/audio record directions
  - Number and present directions in sequence
  - Break down big tasks into several smaller ones
  - Make sure the student comprehends directions; beyond parroting them back.
  - Have someone remind the student
  - Teach the student memory tricks
  - Monitor the student periodically to insure they are not lost.

**Thompson, S. (1996). Neurobehavioral Characteristics Seen in the Classroom: Developing an Educational Plan for the Student with NLD. From NLD on the Web: [www.nldontheweb.org/thompson-5.htm](http://www.nldontheweb.org/thompson-5.htm)**



# ***How to Help the NVLD Child in the Classroom***

- Thinks literally:
  - Explain aloud in words the things you mean that may be misinterpreted
  - Simplify and breakdown abstract concepts
  - Start with concrete concepts and slowly move to abstract
  - Metaphors, emotional nuances, multiple meanings need to be explained concretely
  - Teach the student to say, “I am not sure what you mean”, when they are confused.

**Thompson, S. (1996). Neurobehavioral Characteristics Seen in the Classroom: Developing an Educational Plan for the Student with NLD. From NLD on the Web: [www.nldontheweb.org/thompson-5.htm](http://www.nldontheweb.org/thompson-5.htm)**

# ***How to Help the NVLD Child in the Classroom***

- Asks to many questions:
    - Answer the student's questions when possible and practical
    - Start the other students on the assignment and individually answer the NVLD student's questions.
    - Designate a specific period of time everyday the student can ask questions.
    - Specifically teach the student how to know when it is appropriate to ask for help.
    - Specifically teach the student to politely ask a question
- Thompson, S. (1996). Neurobehavioral Characteristics Seen in the Classroom: Developing an Educational Plan for the Student with NLD. From NLD on the Web: [www.nldontheweb.org/thompson-5.htm](http://www.nldontheweb.org/thompson-5.htm)

# ***How to Help the NVLD Child in the Classroom***

- The student is easily overwhelmed:
  - Diffuse frustrating situations early on
  - Minimize environmental stimuli; especially, visual and tactile
  - When the student is overwhelmed provide them with a place to calm down, i.e. teacher's lounge, a corner in an office; not punishment.
  - Allow the student to opt out of activities in which they become overstimulated.
  - Modify schedule to lessen load

Thompson, S. (1996). Neurobehavioral Characteristics Seen in the Classroom: Developing an Educational Plan for the Student with NLD. From NLD on the Web: [www.nldontheweb.org/thompson-5.htm](http://www.nldontheweb.org/thompson-5.htm)

# ***How to Help the NVLD Child in the Classroom***

- The student may have heightened sensory experience:
  - Eliminate known sensory stressors (i.e., loud clock, fan, etc.)
  - Reduce distractions
  - Talk to student in a low whisper if he/she has hyperacusis (See hyperacusis section)
  - Place student in class where there is the least distraction and auditory and visual stimuli

**Thompson, S. (1996). Neurobehavioral Characteristics Seen in the Classroom: Developing an Educational Plan for the Student with NLD. From NLD on the Web: [www.nldontheweb.org/thompson-5.htm](http://www.nldontheweb.org/thompson-5.htm)**

# ***How to Help the NVLD Child in the Classroom***

- Such students often have stress and anxiety difficulties:
  - Prepare the student for all transitions and novel situations far in advance
  - Make their day predictable, consistent and routine
  - Avoid surprises
  - Allow the student to leave stressful situations-give them a safe room where they can regroup and calm down-give them permission to go there when they need to

**Thompson, S. (1996). Neurobehavioral Characteristics Seen in the Classroom: Developing an Educational Plan for the Student with NLD. From NLD on the Web: [www.nldontheweb.org/thompson-5.htm](http://www.nldontheweb.org/thompson-5.htm)**

# ***How to Help the NVLD Child in the Classroom***

- Avoid the “Illusion of Competency:”
  - Although such students often appear to have knowledge beyond their years they are still not adults and these students have extreme difficulties in some areas and gifts in others. Don’t hold their strengths against them.
  - Apply age and grade expectations flexibly
  - Emphasize their strong academic skills
  - Even though the student can parrot back what you say, it doesn’t mean they comprehend it.
  - Offer explanations when the student appears lost or confused

Thompson, S. (1996). Neurobehavioral Characteristics Seen in the Classroom: Developing an Educational Plan for the Student with NLD. From NLD on the Web: [www.nldontheweb.org/thompson-5.htm](http://www.nldontheweb.org/thompson-5.htm)

# NVLD Treatment Plan for Social Skills



- Verbal Mediation of Poor Visual-Spatial Abilities
  1. Describe pictures in detail verbally
  2. Teach the relationship between objects and pictures
  3. Describe social interactions in movies
  4. Videotape child in social situation and teach from that

Rourke, B.P. (1995). Syndrome of Nonverbal Learning Disabilities: Neurodevelopmental Manifestations. New York, NY: Guilford.

# NVLD/Asperger's Suggestions

- Photographs
- Movies
- Role Playing
- Coaching with mental health back-up
- “Rent a Friend”



Nowicki, S. and Duke, M. (2002). Will I Ever Fit In? New York, NY: Free Press.

Attwood, T. (1998). Asperger's Syndrome: A Guide for Parents and Professionals. Philadelphia, PA: Jessica Kingsley.



# NVLD/Asperger's Suggestions

- Make abstract concrete
- Help with transitions
- Motivate
- Generalize:
  - Mass Practice to Learn vs Distributed Practice - Generalization and Maintain over time



Ozonoff, S. Dawson, G. and McPartland, J. (2002). A Parent's Guide to Asperger Syndrome & High – Functioning Autism. New York, NY: Guilford.

Harrison, L. (May 12, 2006). Personal Communication.

# *People Who Can Help with NVLD/Asperger's Disorder*

- American Speech-Language Hearing Association:  
[www.professional.asha.org](http://www.professional.asha.org)
- Behavioral  
Neurologist/Neuro-psychiatrists and/or Neuro-  
Ophthalmologist: [www.anpaonline.org](http://www.anpaonline.org) and  
[www.ama-assn.org](http://www.ama-assn.org)
- Mental Health Professionals
- American Occupational Therapy Association:  
[www.atoa.org](http://www.atoa.org)



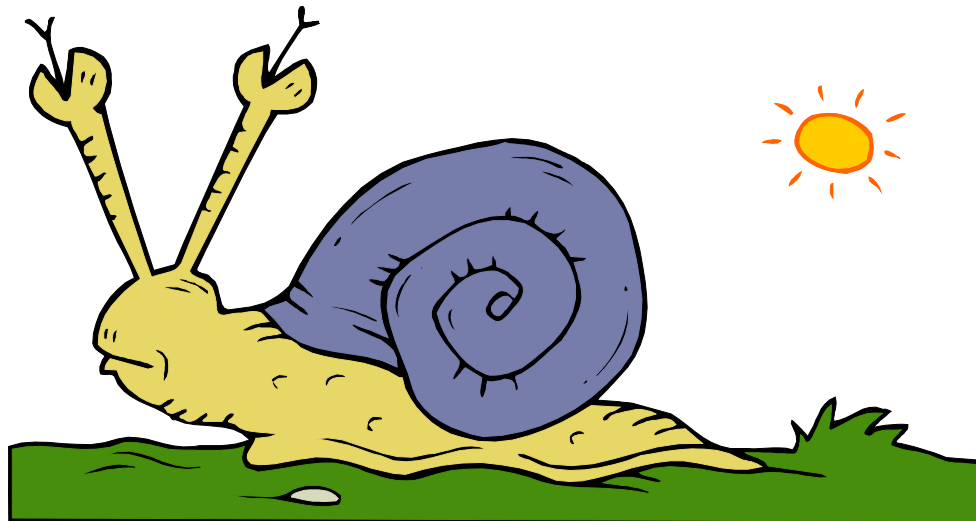
***AD/HD,  
Inattentive  
Type  
&  
Sluggish  
Cognitive  
Tempo  
(SCT)***

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# *Attention-Deficit/Hyperactivity Disorder, Predominately Inattentive Type (Research- 29)*

- Brown believes the Inattentive Type has all the symptoms of the Combined Type except Hyperactivity-Impulsivity

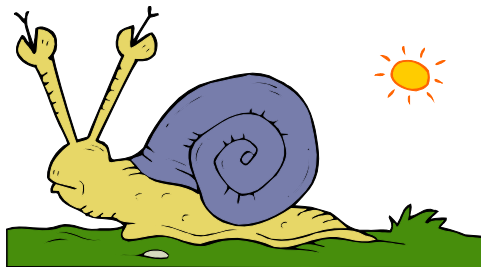




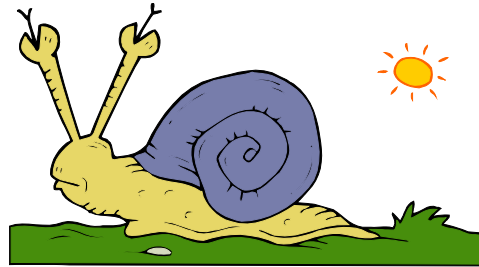
# Inattentive AD/HD (Continued)

Brown believes the following are the areas of difficulty in the Inattentive Type:

1. Difficulty organizing and activating for work
2. Problems sustaining attention and concentration
3. Problems sustaining energy and effort



# Brown and Inattentive AD/HD (Continued)



- 4. Problems managing affective interference
- 5. Problems utilizing working memory and accessing recall

**Brown, T.E. (1995). Differential Diagnosis of ADD Versus ADHD in adults. In K.G. Nadeau (Ed.), Attention-Deficit Disorder in Adults. New York, NY: Bruner/Mazel, 93-108.**

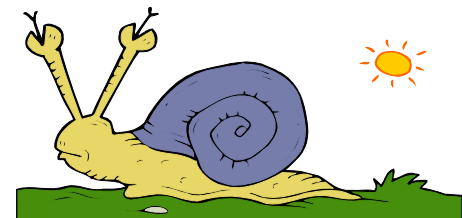
# Attention-Deficit/Hyperactivity Disorder, Predominately Hyperactive-Impulsive Type

- Tzelepis stated she has only seen Combined Type adults in her work and doubts the Predominately Hyperactive-Impulsive Type exists in adults.

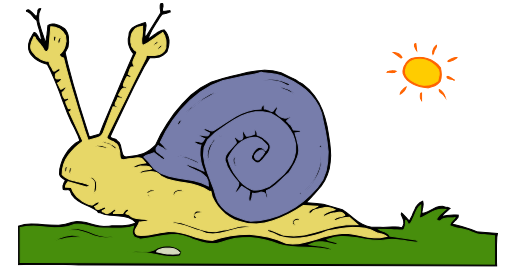
Tzelepis, A. and Mapou, R. (1997, May). Assessment. Paper presented at the Pre-Conference Professional ADD Institute of the 3<sup>rd</sup> Annual National ADDA Adult ADD Conference, St. Louis, MO.

- Barkley, Murphy and Fischer make similar observations.

Barkley, R.A., Murphy, K.R., & Fischer, M. (2008). ADHD in Adults: What The Science Says. New York, NY: Guilford,  
p. 37-38.



# Brown

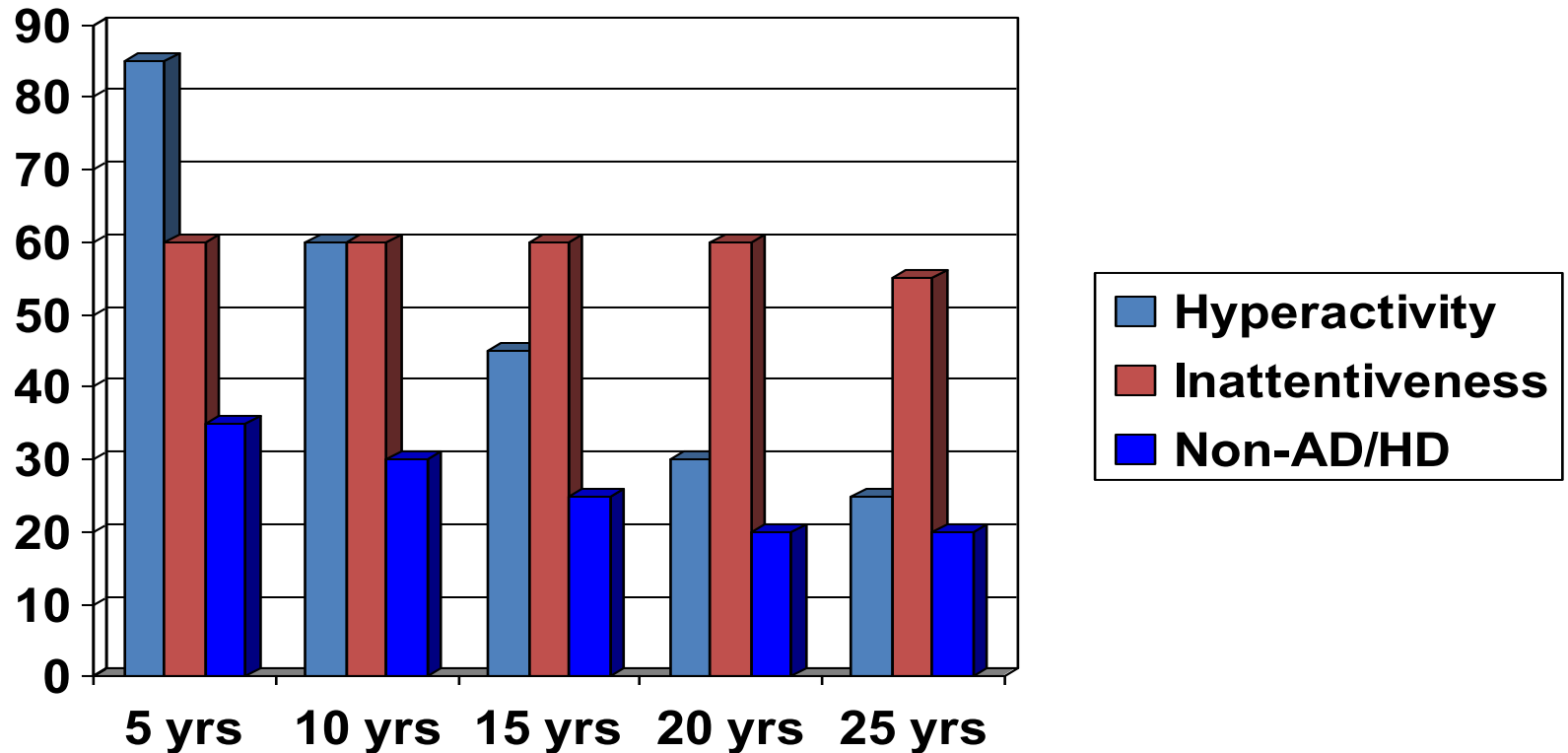


Brown called those who met DSM criteria for Hyperactive-Impulsive Type or Combined Type in Childhood, but only met criteria for Inattentive Type in Adulthood, '**CROSSOVERS**'.

Brown, T.E. (1995). Differential Diagnosis of ADD Versus ADHD in Adults. In K.G. Nadeau (Ed.), A Comprehensive Guide to Attention-Deficit Disorder in Adults. New York: Bruner/Mazel, pp. 93-108.



# Crossovers?



Barkley, R.A., Murphy, K.R., & Fischer, M. (2008). ADHD in Adults: What The Science Says. New York, NY: Guilford.

Weiss, G., & Hechtman, L. (1993). Hyperactive Children Grown Up. New York, NY: Guilford.

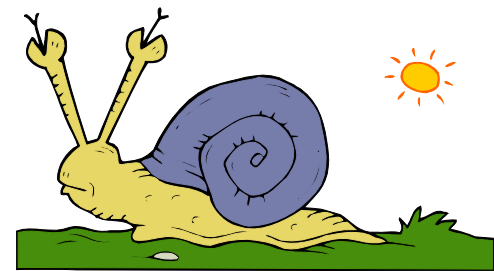
# Crossovers (Continued)

Barkley wrote when the Combined Type changes to the Inattentive Type by adolescence or adulthood then the person should be thought of as having the Combined Type.

**Barkley, R.A. (2002). ADHD and Oppositional Defiant Children. Seminar presented, February 19-20, Phoenix, AZ., The Institute for Continuing Education, Fairhope, AL.**

**Barkley, R.A. (2006). Attention-Deficit Hyperactivity Disorder, Third Edition. New York, NY: Guilford.**

**Barkley, R.A., Murphy, K.R., & Fischer, M. (2008). ADHD in Adults: What The Science Says. New York, NY: Guilford, p. 37-38.**

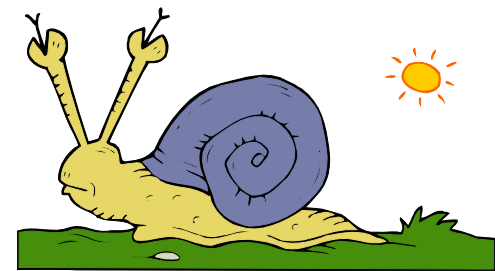


# Mild Combined Type vs. Inattentive Type/SCT

30% to 50% of those with Inattentive AD/HD have the Sluggish Cognitive Tempo (SCT) subtype. The remainder are Shadow Syndrome (Mild) Combined Type.

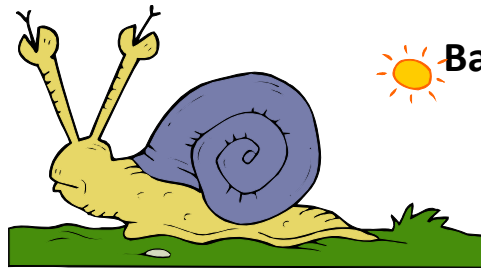
**Barkley, R.A. (2002) Mental and Medical Outcomes of AD/HD. Pre-Conference Institute, # TPA1, Thursday October 17, 2002, 14<sup>th</sup> Annual CHADD International Conference, Miami Beach, FL.**

**Barkley, R.A. (2006). Attention-Deficit Hyperactivity Disorder, Third Edition. New York, NY: Guilford, p. 37.**



# Barkley On Sluggish Cognitive Tempo (SCT)

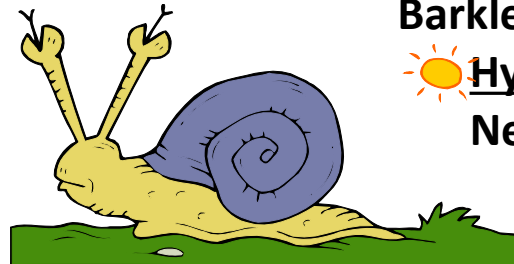
- Sluggish
- Passive
- Hypoactive
- Day Dreamy
- Slow Moving
- Staring
- Confused
- In a Fog
- Few Externalizing Problems (ODD/CD)
- More Internalizing Problems (Anxiety & Depression)
- Socially Withdrawn
- Information Processing Deficits



Barkley, R. A. (2006). Attention-Deficit Hyperactivity Disorder, 3<sup>rd</sup> Edition. New York, Guilford, PP. 79-80.

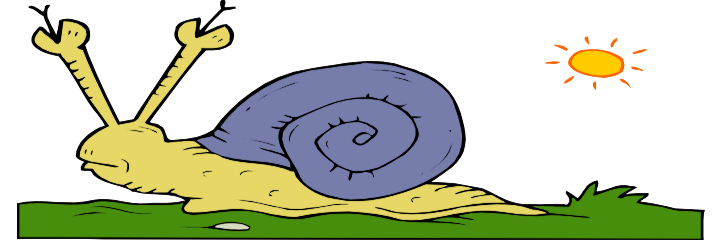
# Barkley On Sluggish Cognitive Tempo (SCT)

- Low Levels of Curiosity
- Low Interest
- Lack Enjoyment of Learning
- Prefer Less Challenging Tasks
- Prefer Cooperative Situations
- Relies on External Reward for Determining Success
- Trouble Determining Relevant Information



Barkley, R. A. (2006). Attention-Deficit Hyperactivity Disorder, 3<sup>rd</sup> Edition. New York, Guilford, PP. 79-80, 413.

# Barkley On SCT



- **SCT children are more likely to have Mathematics Disorder/Dyscalculia.**
- **SCT children are passive, shy and withdrawn socially and not socially rejected.**
- **They appear to have deficits in social skills.**
- **SCT children do not respond to stimulants.**
- **SCT = Processing Problem/Selective Attention**
- **SCT finish school work...accuracy problem**

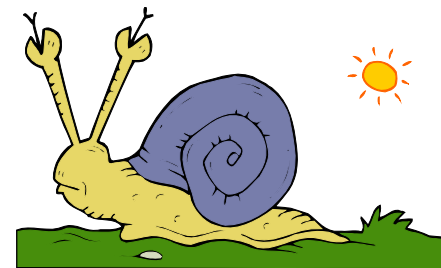
**Barkley, R.A. (2006). Attention-Deficit Hyperactivity Disorder, Third Edition. New York, NY: Guilford, p. 202.**

**Barkley, R.A. (2008). Advances in ADHD: Theory, Diagnosis and Management. J & K Seminars, L.L.C., 1861 Wickersham Lane, Lancaster, PA 17603; 800-801-5415; [www.jkseminars.com](http://www.jkseminars.com).**

# *Willcutt, Chhabildas and Pennington's Sluggish Cognitive Tempo Symptoms*

- More problems with math achievement than Combined Type and 'Normals'.
- More Internalizing Problems than Combined Type/Few, if any Externalizing Problems
- Significant Processing Speed Problems

Willcutt, E.G., Chhabildas, N. and Pennington, B.F. (2001). Validity of the DSM-IV Subtypes of ADHD. ADHD Report, 9 (1), pp. 2-5.



# Possible Etiology of SCT



ADHD, Combined Type..., “may be a problem in the functional level of prefrontal-limbic pathways, particularly the striatum...whereas ADHD-PI (SCT, sic.) may involve more posterior associative cortical areas and/or cortical-subcortical feedback loops, perhaps including the hippocampal system.” (p. 204)

**Barkley, R.A. (2006). Attention-Deficit Hyperactivity Disorder, Third Edition. New York, NY: Guilford, p. 204**



# *Possible Etiology of SCT*



AD/HD appears to involve the neurotransmitter dopamine and SCT appears to involve norepinephrine. Epinephrine urine excretion may be significantly correlated with inattention in SCT children.

**Barkley, R.A. (2006). Attention-Deficit Hyperactivity Disorder, Third Edition. New York, NY: Guilford, p. 204.**

# *Neuropsychological Symptoms of SCT*



“Lab studies suggest that children with SCT may manifest significantly more errors with information processing, set shifting, focused attention, and possibly memory retrieval that are not evident in ADHD-C.” (sic., ADHD, Combined Type) (p. 80)

**Barkley, R.A., (2006). Attention-Deficit Hyperactivity Disorder, Third Edition. New York, NY: Guilford, p. 80.**

## *Neuropsychological Symptoms of SCT*



**“These findings intimate that children with ADHD-PI (sic., SCT) may have more of a problem with memory, perceptual-motor speed, or even central cognitive processing speed, whereas children with ADHD-C (sic., Combined Type) manifest more problems with behavioral disinhibition and poor attention to tasks, in addition to their over activity.”  
(p. 203)**

**Barkley, R.A. (2006). Attention-Deficit Hyperactivity Disorder. New York, NY: Guilford, p. 203.**

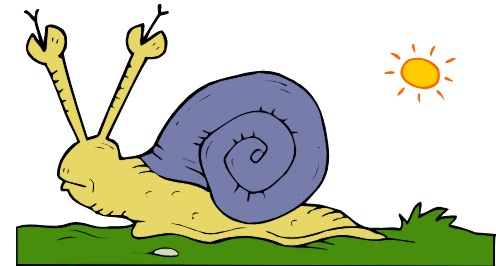
# Inattentive AD/HD and LD

- Inattentive AD/HD is often confused with LD.

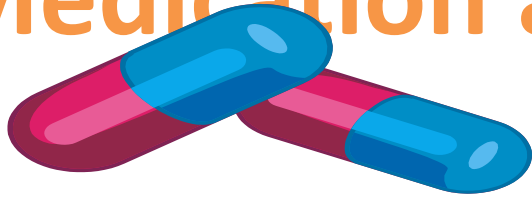
Barkley, R.A. (1998). ADHD In Children, Adolescents, and Adults: Diagnosis, Assessment and Treatment, New England Educational Institute, Cape Cod Symposium, August, Pittsfield, MA.

- Inattentive Type MAY be related to Central Auditory Processing Disorder (CAPD)

Barkley, R.A. (2002B). ADHD and Oppositional Defiant Children. Seminar presented, February 19-20, Phoenix, AZ.



# Medication and Inattentive AD/HD



- Only about 20% of those with Inattentive AD/HD respond to Stimulant Medication.
- Those with Sluggish Cognitive Tempo probably do not respond.

**Barkley, R.A. (2002) Mental and Medical Outcomes of AD/HD. Pre-Conference Institute, # TPA1, Thursday October 17, 2002, 14<sup>th</sup> Annual CHADD International Conference, Miami Beach, FL.**

**Barkley, R.A. (2006). Attention-Deficit Hyperactivity Disorder, Third Edition. New York, NY: Guilford, p. 202.**

**Ramsay, R. (2010). Nonmedication Treatments for Adult ADHD. Washington, DC: American Psychological Association Press, p. 15.**

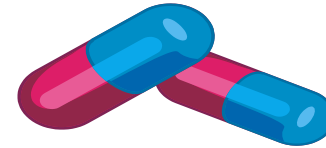
# Medication and Sluggish Cognitive Tempo AD/HD



- Strattera (Atomoxetine):
  - Selective Norepinehrine Reuptake Inhibitor  
Good for depression & anxiety too
  - Schedule II: Not Controlled – Call in Scripts
  - Side Effects: insomnia, nausea, dry mouth, constipation, dizziness, decreased appetite, urinary difficulty, erectile disturbance, decreased libido, slight increase in blood pressure and pulse, liver problems (rare)

Author (2004). Managing Medication for Adults with AD/HD. National Resource Center on AD/HD (A Program of CHADD), p. 1-12; From Website: [www.helpforadhd.org/documents/wwk10.pdf](http://www.helpforadhd.org/documents/wwk10.pdf).

# Medications and Sluggish Cognitive Tempo AD/HD



- Provigil (Modafinil)
  - Will be marketed as “*Sparlon*” as an AD/HD medication
  - Significantly reduces inattention, hyperactivity and impulsivity in home and school, no withdrawal rebound
  - Few side effects: Insomnia (28%), Headache (22%), Decreased Appetite (18%), Abdominal Pain; Insomnia and Appetite problems decrease with time
  - Low abuse potential/Not a controlled substance- Schedule IV Medication
  - May increase right frontal lobe wakefulness, alerting and executive functioning

# Medication and Sluggish Cognitive Tempo

## AD/HD (Continued)

- The FDA recently rejected approving Modafinil as an AD/HD medication.

Author (February/March, 2006) Two New Medications Promise Greater Convenience, Smaller Potential for Abuse. ADDitude, 6 (4), p. 11.

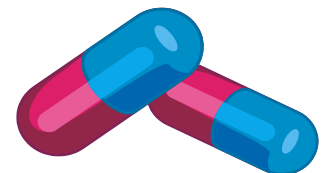
Kelly, J. (August, 2005). Phase III Trials Demonstrate Modafinil Efficacy in ADHD. NeuroPsychiatry Reviews, 6 (7), [www.neuropsychiatryreviews.com/aug05/modafinil.html](http://www.neuropsychiatryreviews.com/aug05/modafinil.html) .

Author (March 24, 2006). FDA Committee Rejects ADHD use for Modafinil. National Public Radio report. Available from website: [www.npr.org/templates/story.php?StoryId=5298885](http://www.npr.org/templates/story.php?StoryId=5298885)

.

### *Other Reference of Interest*

Biederman, J., Swanson, J., Wigal, S.B., Kratochvil, C.J., Boellner, S.W., Earl, C.Q., Jiang, J. and Geenhill, L. (December, 2005). Efficacy and Safety of Modafinil Film-Coated Tablets In Children and Adolescents with Attention-Deficit/Hyperactivity Disorder: Results of a Randomized, Double-Blind, Placebo-Controlled Flexible-Dose Study. Pediatrics, 116 (6), pp. e-777-e-784; From Website: [www.pediatrics.aappublications.org/cgi/content/full/116/6/e777](http://www.pediatrics.aappublications.org/cgi/content/full/116/6/e777) .



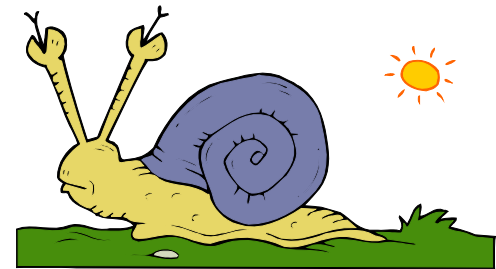


# Accommodating SCT in School

- Behavioral interventions that focus on noncompetitive external rewards for meeting specific goals.
- Extended time to address slow processing speed.
- Social skills training in groups without conduct disordered kids. SCT kids benefit from social training.
- About 1/3 have comorbid LD. Treat comorbidities.

Barkley, R.A. (2006). Attention-Deficit Hyperactivity Disorder. New York, NY: Guilford, p. 552.

Barkley, R.A. (2008). Advances in ADHD: Theory, Diagnosis and Management. J & K Seminars, L.L.C., 1861 Wickersham Lane, Lancaster, PA 17603; 800-801-5415; [www.jkseminars.com](http://www.jkseminars.com).



# Accommodating SCT in School

- SCT children experience significantly more anxiety than children with other types of AD/HD. They may respond better to behavioral treatments that focus on reducing their anxiety.

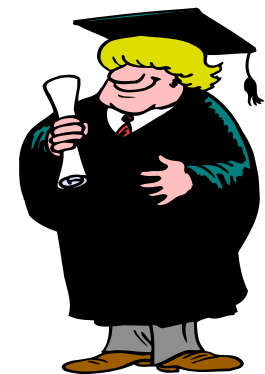
Ramsay, R. (2010). Nonmedication Treatments for Adult ADHD. Washington, DC: American Psychological Association Press, p. 15.

# *Other Seminar Dr. Blake Does for Cross Country Education*

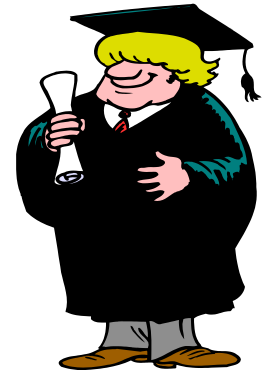
## ***Assessment and Treatment of Dyslexia in Adolescents and Adults: No Adults Left Behind***

- Six hour seminar with continuing education credits
- Audiotapes and CD available for the current seminar and the “Dyslexia” seminar from:

[www.crosscountryeducation.com](http://www.crosscountryeducation.com)



*Kevin T. Blake, Ph.D., P.L.C.*



- **Case Consultation**
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  - **[www.drkevintblake.com](http://www.drkevintblake.com)**



# RESEARCH



# AD/HD Genes (Research-1)

- DRD4 – 7 + Repeat
- DAT1 – 480 bp
- DBH – Taql (A2 allele)
- DRD2
- SNAP25
- MAO-A
- 13 other possible genes

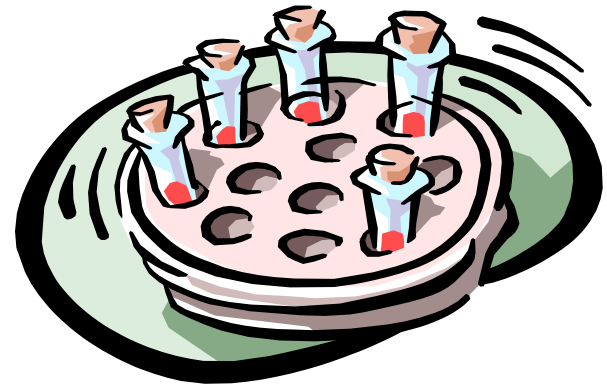


Barkley, R.A. (2008). ADHD: Advances in Nature, Diagnosis and Etiology. Handout for seminar: .  
Advances in ADHD: Theory, Diagnosis and Management. J & K Seminars, L.L.C., 1861  
Wichersham Lane, Lancaster, PA 17603; 800-801-5415; [www.jkseminars.com](http://www.jkseminars.com), p. 9  
(Handout).

# Genetics and Dyslexia (Research-2)

- Colorado Learning Disabilities Research Center:
  - Heritability linkage for dyslexia-Chromosomes 2, 3, 6, 15, 18

Olsen, R.K. (November 11, 2005). Norman Geshwin Lecture: Genes, Environment and Dyslexia. Paper presented at the 53<sup>rd</sup> Annual International Dyslexia Association Conference, Denver, CO.



# Genes & ASD (Research-3)

- Fragile X Syndrome (5 to 15%)
- NLGN3
- NLGN4X
- SHANK3
- NRXN1
- 5p14.1
- 16p11.2, Etc.



Pinto, D., et al. (June 9, 2010). Functional impact of global rare copy number variations in Autism Spectrum Disorders. Nature,  
[www.nature.com/nature/journal/vaop/ncurrent/full/nature09146.html](http://www.nature.com/nature/journal/vaop/ncurrent/full/nature09146.html).



# Possible Medication for Fragile X (Research-4)

Drug manufacturer Novartis stated it is developing a medication called AFQ056 which initial research has demonstrated to be very promising in treating Fragile X Syndrome. It may be that this medication helps synapses to reduce background 'noise'.

Harris, G. (April 29, 2010). Promise Seen in Drug for Retardation Syndrome. New York Times: [www.nytimes.com/2010/04/30/health/research/30fragile.html](http://www.nytimes.com/2010/04/30/health/research/30fragile.html).

Author (May 13, 2010). Efficacy, Safety and Tolerability of AFQ056 in Fragile X Patients: [www.clinicaltrials.gov/ct/show/NCT00718341](http://www.clinicaltrials.gov/ct/show/NCT00718341).

# Employment & ADHD (Research-5)



- ADHD workers have significantly lower salaries.
- They are absent from the job more and significantly more underproductive than non-ADHD workers.
- They have more on the job accidents.
- On average ADHD costs the household \$10,000 per year of income.

Ramsay, R. J. (2010). Non-Medication Treatments for Adult ADHD. Washington, DC: American Psychological Association, p. 79.

# Mirror Neuron Neurology (Research-6)

“This circuitry comprises the human superior temporal sulcus and the human mirror neuron system –namely, the inferior frontal cortex, which seems particularly important for coding the goal imitated action..., and the rostral part of the inferior parietal lobe.” (p. 158)

**Goldstein, S., Naglieri, J.A., and Ozonoff, S. (2009). Assessment of Autism Spectrum Disorders. New York, NY: Guilford, p. 158.**

# COGMED and ADHD (Research-7)



- Recent study has shown that the use of COGMED with stimulant medication reduces working memory deficits better than medication alone. Children with ADHD went up 1 SD in working memory and results held for 6 months.

Holms, J., Gathercole, S.E., Place, M., Dunning, D.L., Hilton, K.A. and Elloitt, J.G. (2009). Working memory deficits can be overcome: Impacts of training and medication on working memory in children with ADHD. Applied Cognitive Psychology, From Wiley Interscience abstract: [www3.interscience.wiley.com/journal/122462190/abstract?CRETRY+1&SRETRY=0](http://www3.interscience.wiley.com/journal/122462190/abstract?CRETRY+1&SRETRY=0)

# COGMED and ADHD (Research-8)



- Treatment Group:
  - Significant gains in all types of working memory, even verbal STM and WM - improves ability to follow directions as well
  - No significant drops in 6 months
  - Significant increases in math and following directions in 6 months

**Holmes, J., Gathercole, S.E., and Dunning, D.L. (2009). Adaptive training leads to sustained enhancement of poor working memory in children. Developmental Science, 12, F9-F15.**

# COGMED and ADHD (Research-9)



Second study:

- Children with low working memory for their age
- Random assignment into two groups: treatment and sham treatment/control
- Control group got significantly better on verbal short-term memory and verbal working memory. No difference on visual-spatial working memory and visual-spatial short-term memory.



## (Research-10)

- Problems with research:
  - Unclear if positive outcomes connect to improved life functioning.
  - How does it work?
  - Maybe one of the first attempts at cognitive training that has been successful (Barkley, 2008).
  - But, Barkley (2008) remains cautious and wants more research before he recommends it.

Ramsay, R. (2010). Nonmedication Treatments for Adult ADHD. Washington, DC: American Psychological Association Press.

Barkley, R.A. (2008). Advances in ADHD: Theory, Diagnosis and Management. J & K Seminars, L.L.C., 1861 Wickersham Lane, Lancaster, PA 17603; 800-801-5415; [www.jkseminars.com](http://www.jkseminars.com), Disc 7, Tack 1.

# **Developmental Phonagnosia (Research-11)**

- **The inability to recognize voices.**

**Garrido, L., Eisner, F. Mcgettigan, C., Stewart, L., Sauter, D., Hanley, J.R., Schweinberger, S.R., Warren, J.D., and Duchaine, B. (2009).  
Developmental Phonagnosia: A Selective Deficit of Vocal Identity Recognition.  
Neuropsychologia, 47 (1), pp. 123-131.**



# Prosopagnosia is Highly Genetic (Research-12)

Wilmer, J.B., Germine, L. Chabris, C.F. Chatterjee, G., Williams, M., Loken, E., Nakayama, K. and Duchaine, B. (Submitted). Human Face Recognition Ability is Highly Heritable.  
Proceedings of the National Academy of Sciences of the United States of America.



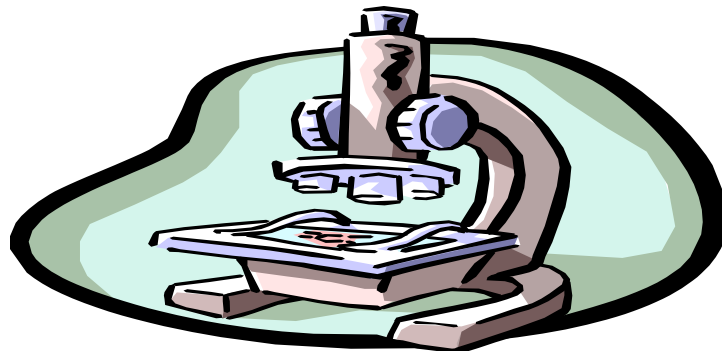
# Computer Programs to Treat Prosopagnosia (Research-13)



**Tanaka, J.W., Wolf, J.M., Klaiman, C., Koenig, K., Cockburn, J., Herlihy, L., Brown, C., Stahl, S., Kaiser, M.D., and Schultz, R.T. (in press). Using Computerized Games to Teach Face Recognition in Children with Autism Spectrum Disorder: The Let's Face It! Program, Journal of Child Psychology and Psychiatry.**

# MTA STUDY (Research-14)

**Jensen, P.S., et al. (February, 2001). Findings From the MINH Multimodal Treatment Study of ADHD (MTA): Implications and Applications for Primary Care Providers. Journal of Developmental and Behavioral Pediatrics, 22 (1), pp. 60-73.**



# ***Good Resources for Mnemonic Techniques (RESEARCH-15)***

- [www.doctormemory.com](http://www.doctormemory.com)
- Doctor memory
- Lucas, J. and Lorayne, H. (1974). The Memory Book. New York, NY: Ballantine.



# *Technology for Memory Difficulties*

## **(Research-16)**

- Watchminder 2
  - Vibrates to remind student of deadlines
  - It can remind them to check to see if they are 'on task'.



Available from:

[www.watchminder.com/](http://www.watchminder.com/)

# *Technology for Memory Difficulties*

## **(Research-17)**

- Record lectures with a digital recorder
- Available from:
  - Walmart
  - Best Buy
  - Staples, etc.



# *Technology for Memory Difficulties* (RESEARCH-17)

- Flip Camera:

[www.theflip.com](http://www.theflip.com)



# *Technology for Memory Difficulties* (RESEARCH-18)

- Personal Digital Assistant (PDA)

[www.palm.com](http://www.palm.com)

- Time Management Organizer

[www.FranklinCovey.com](http://www.FranklinCovey.com)





# ***Technology for Memory Difficulties*** **(RESEARCH-19)**

- Rolodex Organizer:  
[www.franklin.com](http://www.franklin.com)
- Livescribe Smartpen:  
[www.livescribe.com](http://www.livescribe.com)



# **Social Competence Intervention Program (SCIP) (RESEARCH-21)**

Guli, L.A., Wilkinson, A.D., and Semrud-Clikeman, M. (2006). Social Competence Intervention Program (SCIP): A Drama-Based Intervention for Youth on the Autism Spectrum. Champaign, IL: Research Press.

# **DIR/Floortime (RESEARCH-22)**

**“This includes helping children to develop capacities to attend and remain calm and regulated, engage, and relate to others, initiate and respond to others, initiate and respond to all types of communication beginning with emotional and social affect based gestures, engage in shared social problem solving and intentional behavior involving a continuous flow of interactions in a row, use of ideas to communicate needs and think and play creatively and build bridges between ideas in logical ways which lead to higher level capacities to think in multicausal , grey area and reflective ways.”**

**Interdisciplinary Counsel on Developmental and Learning Disorders (ICDL)  
(8/11/2010). What is dir/floortime?**

**[www.icdl.com/dirFloortime/overview/index.shtml/](http://www.icdl.com/dirFloortime/overview/index.shtml/)**

# DIR/Floortime (RESEARCH-23)

- This model takes into account each child's unique biology and temperament.
- The model describes how helping professionals, caregivers, teachers, etc. can tailor their work to meet each child's unique needs.

Interdisciplinary Counsel on Developmental and Learning Disorders (ICDL)  
(8/11/2010). What is dir/floortime?

[www.icdl.com/dirFloortime/overview/index.shtml/](http://www.icdl.com/dirFloortime/overview/index.shtml/)

# DIR/Floortime (RESEARCH-24)

“Floortime is a specific technique to both follow a child’s natural emotional interests (lead) and at the same time challenge the child towards greater and greater mastery of the social, emotional and intellectual capacities.”

Interdisciplinary Counsel on Developmental and Learning Disorders (ICDL)  
(8/11/2010). What is dir/floortime?.  
[www.icdl.com/dirFloortime/overview/index.shtml/](http://www.icdl.com/dirFloortime/overview/index.shtml/)

# Applied Behavioral Analysis (RESEARCH-25)

- 40 year of research has shown these techniques are effective with those with intellectual disabilities and autism spectrum disorders.
- Many professional organizations and state governments have endorsed the use of these techniques with such individuals.

Hagopian, L.P., and Boelter, E.W. (8/27/2010). Applied Behavior Analysis and Neurodevelopmental Disorders: Overview and Summary of Scientific Support.  
Kennedy Krieger Institute: [www.kennedykrieger.org/kki\\_misc.jsp?pid=4761](http://www.kennedykrieger.org/kki_misc.jsp?pid=4761)

# Computer Programs to Treat Prosopagnosia (RESEARCH-26)



- Golan, O., and Baron-Cohen, S. (2006). Systemizing Empathy: Teaching Adults with Asperger Syndrome or High Functioning Autism to Recognize Complex Emotions Using Interactive Multimedia. Development and Psychopathology, 18, pp. 591-617.

# Computer Programs to Treat Prosopagnosia (RESEARCH-27)



**“We concluded that using *The transporters* significantly improves emotion in children with ASC” (Autism Spectrum Conditions). (p. 269)**

**Golan, O., Ashwin, E., Granader, Y., McIntock, S., Day, K., Leggett, V., and Baron-Cohen, S. (2009). Enhancing Emotion in Children with Autism Spectrum Conditions: An Intervention Using Animated Vehicles with Real Emotional Faces. Journal of Autism and Developmental Disorders, 40 (3), pp. 269-279.**



# Computer Glasses and ASD (RESEARCH-28)

**el Kalioby, R., Picard, R., and Baron-Cohen, S.  
(2006). Affective Computing and Autism.  
Annual of the New York Academy of Sciences,  
1093, pp. 228-248**



# **SCT and DSM-5 (RESEARCH-29)**

**Adams, Z.W., Milich, R. and Fillmore, M.T.  
(June, 2010). A Case for the Return of  
Attention-Deficit Disorder in DSM-5. ADHD  
Report,18 (3), pp. 1-6.**