

# Referral, Assessment, and Treatment of School-aged Children

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# The plan for this talk

- What is a neuropsychologist
- Who is good at spotting “normal”
- When to refer
- Typical referral questions
- To whom do I refer?
- What happens in an neuropsychological assessment
- Why a diagnosis matters
- Guides to effective interventions

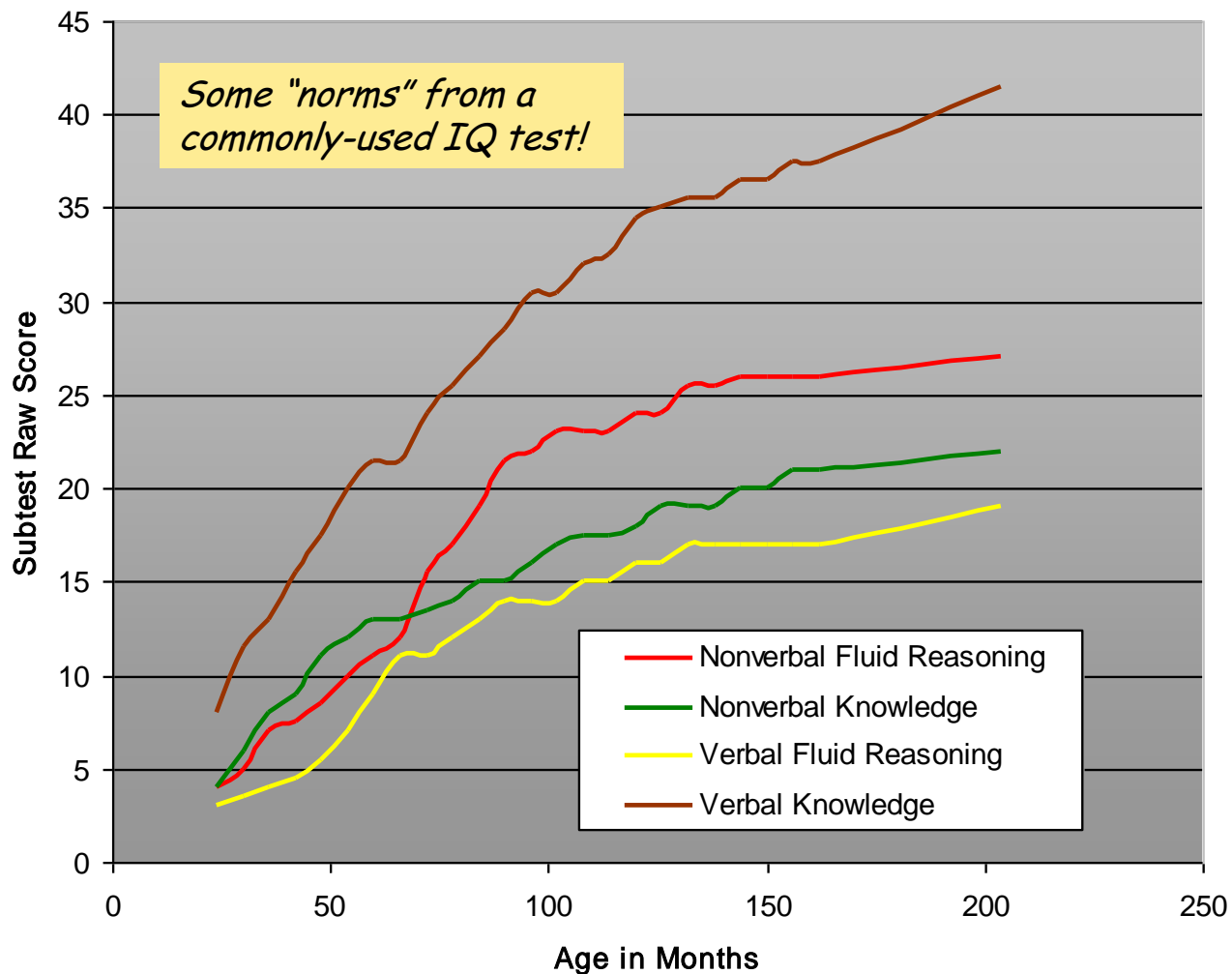
# What is a neuropsychologist?

- Doctoral training in psychology
- Specialized coursework
- Postdoctoral training (two years)
- Has probably done and can do ‘regular psychologist’ things
- Additional specialized training in assessment of cognitive functioning
- Diagnoses abnormality in cognitive functions
- Does lots of testing!



# What is normal?

Select Subtests from SB:5th Edition



# Identifying “normalness”

- Parents

- Typical number of children under observation?  
One to five
- Have an emotional involvement

- Pediatricians

- See many, many children but for brief periods of time
- Normal range is wide in early childhood (when most parents have questions)
- Developmental “screeners” limited in scope, designed to identify outliers

# Identifying “normalness”

- Neuropsychologists
  - See comparatively few children.
  - See children who have been referred (may be atypical).
  - *Give tests!*
- Teachers
  - Closely observe thousands of children during their careers.
  - See mostly normal children.
  - Give tests...
  - (...but not all the time)
- *Teachers know “normal” very well!*
- *They also know “abnormal!”*

# When to refer

*The purpose of referral is to have a person with training or experience different from your own provide additional information about the child.*

*Referral is typically done to answer specific questions about a child's developmental, cognitive, or emotional status.*

# Typical areas of concern...

- Fine or gross motor development
- Language acquisition
- Social development
- Learning
- Emotional development
- Chronic or acute medical problems
- Family / parenting issues
- General ability or rate of growth
- Attention / behavior

# ...lead to common referral questions

- Social reciprocity / language / behavior
  - *“Is this child autistic?”*
- Rate of learning
  - *“Is there a learning disability?”*
- Rigid, shuts down, has outbursts
  - *“Is there an emotional disorder?”*
- Seems to be generally slow
  - *“Is this child mentally retarded?”*
- Has trouble focusing, seems impulsive, bothers other children
  - *“Does this child have ADHD?”*



# The most common questions...

- ADHD?
- Auditory processing disorder?
- Autism? Developmental issue?
- Learning disability?
- Emotional problems?
- How can I have this kid in my classroom?
- How can my child learn more effectively?

**...can be readily answered!**

# Who to refer to?

- Public schools have procedures and personnel to manage this sort of thing
- This issue is more complex independent schools
- Physician?
- Child Psychologist?
- Audiologist?
- “Learning specialist?”
- Speech/Language pathologist?
- School Psychologist?

*Why a neuropsychologist?*



# A neuropsychology haiku

Every brain different...

Nature and nurture conspire

...to build a snowflake



# Why “label” a child with a diagnosis?

- Diagnosis provides a model that guides treatment and which facilitates thinking about the child
- Provides a basis for expectations of growth and helps to evaluate treatment efficacy
- If intervention is not successful, reconsider the diagnosis (maybe you are using the wrong model)
- *Accurate diagnosis guides effective intervention*



# Why all the testing?





## Q: What do these all have in common?

- Depression
- Oppositional defiant disorder
- Anxiety disorder
- Learning disability
- Tourette disorder
- Poor social history
- Lead poisoning
- Poor hearing
- Auditory processing disorder
- Language disorder
- Physical or sexual abuse
- Post-Traumatic Stress Disorder
- Executive dysfunction
- Head injury
- Neurological disease

**A: They are all routinely mistaken for ADHD.**



# Accurate diagnosis requires multiple sources of data

- Parent report
- Teacher report
- Behavioral and school history
- Medical history
- Behavioral observation
- Objective test data
- Neurological examination in some cases
- Integration of findings

# Domains for Assessment

- Intelligence
- Visual attention
- Auditory attention
- Academic achievement
- Executive functions
- Visual memory
- Verbal memory
- Expressive language
- Receptive language
- Vocabulary
- Fine motor skills
- Visual-motor integration
- Mood
- Personality
- Parent/teacher info
- Review of relevant academic/medical records

# NP eval. typically includes

- Intelligence
- Attention / organization
- Fine motor
- Academic achievement
- Memory
- Mood
- Parent / teacher questionnaires (assessing mood, behavior, strengths)
- Additional measures are based on referral questions and preliminary test results

# Result of Evaluation

- Comprehensive report (8-15 pages) detailing
  - Medical, developmental and social history
  - Summary of previous evaluations/treatments
  - Behavioral observations
  - Test results (lots and lots of test results)
  - Integrative summary of findings placed in the context of medical, developmental and psychosocial history
- Diagnostic formulation
- Recommendations for intervention / remediation
- Follow-up and case management

# Common diagnoses in children

- Specific Learning Disability
  - Reading disorder (Dyslexia)
  - Disorder of written expression
  - Mathematics disorder
- Language Disorders
  - Mixed Receptive-expressive Language Disorder
  - Expressive or Receptive language disorder
- Phonological disorder (formerly Developmental Articulation Disorder)

# Common diagnoses in children

- Pervasive Developmental Disorders
  - Autism
  - Asperger's Disorder
  - PDD nos
- Attention Deficit Hyperactivity Disorder
  - Predominantly inattentive
  - Predominantly hyperactive
  - Combined type



# Common diagnoses in children

- Developmental Coordination Disorder
- Conduct Disorder
- Oppositional Defiant Disorder
- Tic Disorders
  - Tourette's Disorder
  - Chronic Motor or Vocal Tic
- Mental retardation

# Key features of effective intervention

- Have a rational, theoretical foundation
- Have survived scrutiny by “friendly” and “unfriendly” professionals
- Withstand comparison to alternatives and waitlists
- Produce changes that outlast novelty and placebo effects

## **Again:**

*Accurate diagnosis guides effective intervention.*

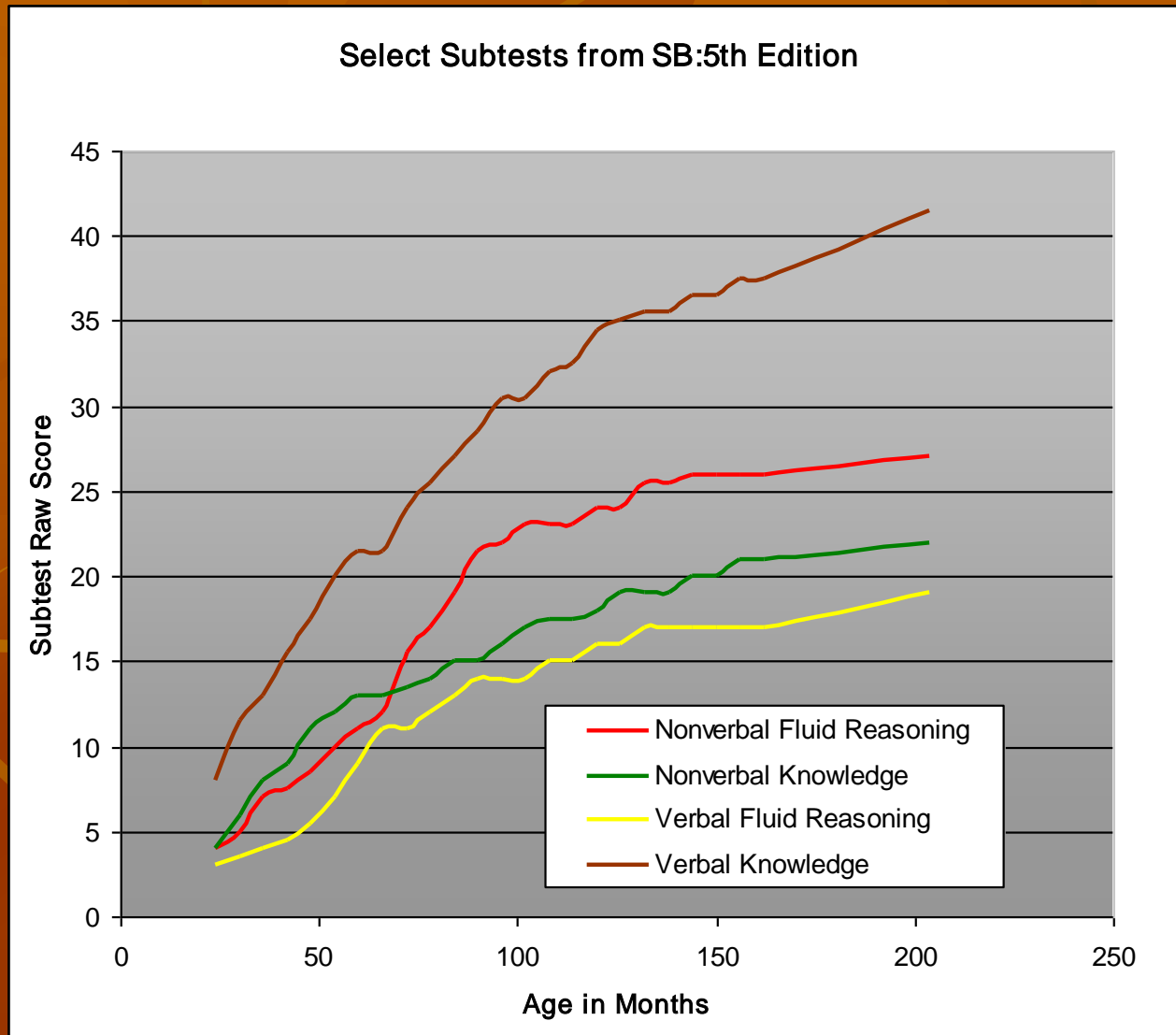
*A diagnosis is a model that should guide our strategies and expectations.*

*If the model does not accurately serve us, we may need to reconsider the diagnosis.*

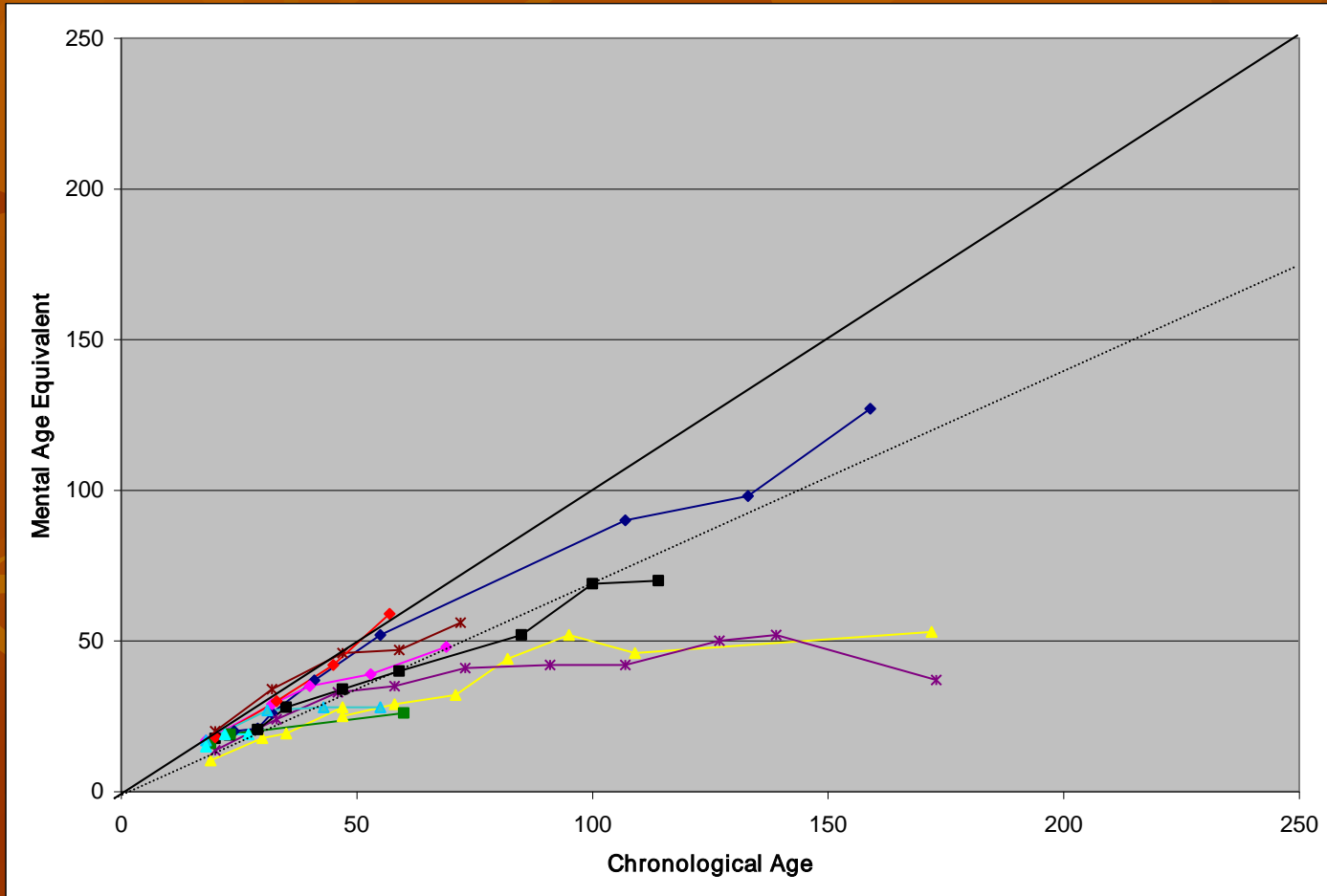


# **Learning and the brain**

# Some norms....



# LD versus “normal” children





# Some other norms....

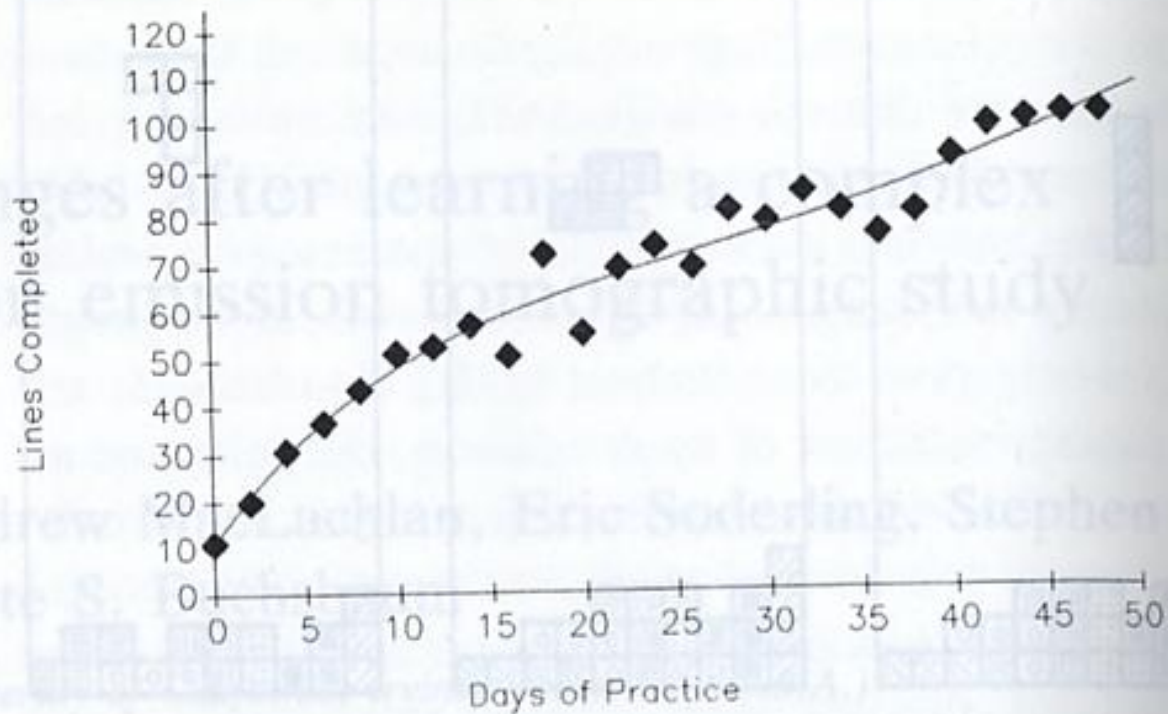
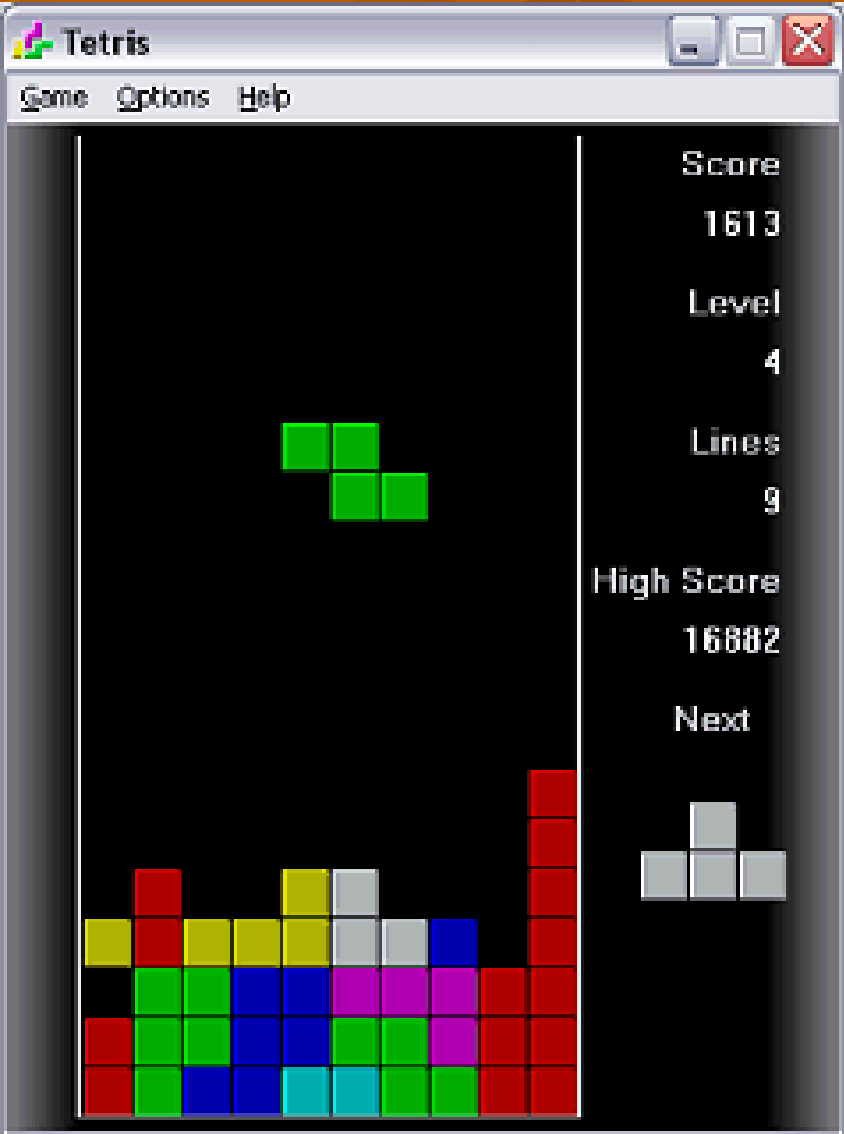


Fig. 2. Tetris learning curve. Plots average score (lines completed) at each practice session. Some later sessions included fewer subjects.

Source: Haier RJ, Siegel BV Jr, MacLachlan A, Soderling E, Lottenberg S, Buchsbaum M. (1992). Regional glucose metabolic changes after learning a complex visuospatial/motor task: a positron emission tomographic study. *Brain Res. Jan 20;570(1-2)*, 134-143.



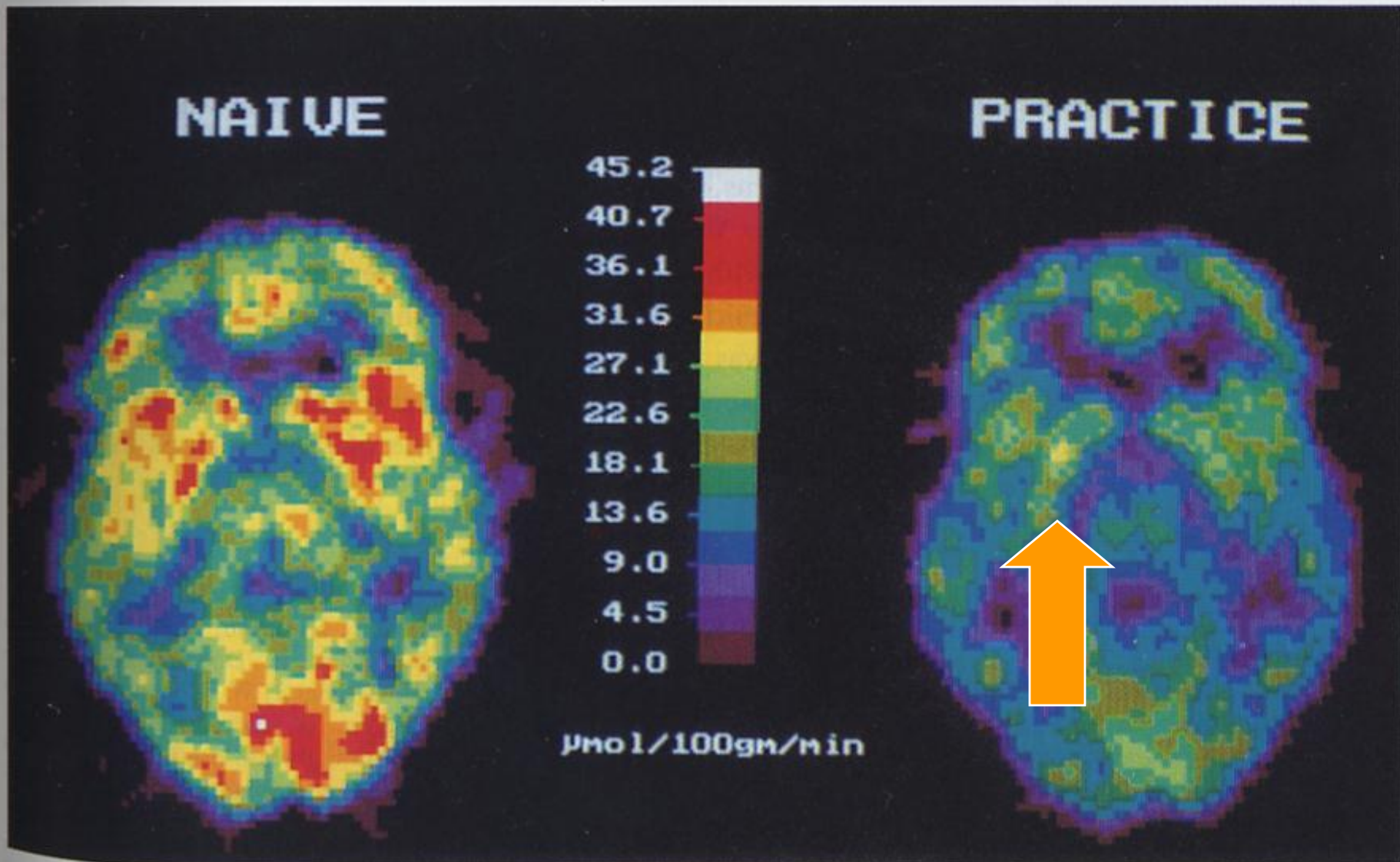


Fig. 6. PET images (41% atlas slice) of a subject in naive and practiced conditions, showing decreases in GMR.

Source: Haier RJ, Siegel BV Jr, MacLachlan A, Soderling E, Lottenberg S, Buchsbaum M. (1992). Regional glucose metabolic changes after learning a complex visuospatial/motor task: a positron emission tomographic study. *Brain Res. Jan 20;570(1-2)*, 134-143.

# Interventions

- Medical
  - Medication (Ritalin, Prozac)
  - Surgical procedure (palate reconstruction, shunt placement)
- Behavioral
  - Developmental (language, motor functioning)
  - Psychological

# Interventions

- Educational
  - LD intervention
  - Classroom accommodations
- Psychological
  - Therapy
  - Education
  - Advocacy



# “Alternative interventions”

- Tend to be developed by soloists
- Claim to improve many unrelated skills
- May claim to work through indirect methods
- Efficacy is largely supported by anecdotal reports
- May have significant practitioner effects
- Require expensive or extensive commitment of time and money
- Tend to spread through “Followers”
- Do not stand up to controlled study—the more controlled, the weaker the findings
- May “work” briefly through novelty, placebo, or palliative effects

# Scotopic Sensitivity Syndrome ( Colored “Irlin Lenses” or filters)

- “...it is the position of the American Optometric Association that:
- There is currently no scientific research to support the "scotopic sensitivity syndrome" hypothesis.
- Undetected binocular vision problems may be a factor in individuals who exhibit the symptoms of the so-called "scotopic sensitivity syndrome." A comprehensive eye/vision examination with particular emphasis on binocular vision function is recommended for all individuals experiencing reading or learning difficulties, as well as those showing signs and symptoms of visual efficiency problems.
- The American Optometric Association **encourages and supports further research** to investigate the effect that specifically **tinted lenses and filters** may have on a person's visual function related to reading performance.
- Finally, optometrists must contribute to the multidisciplinary approach for the diagnosis and management of reading and learning disorders. “
- Source: <http://www.aoa.org/clincare/pediatrics-tinted.asp>

# Therapeutic Listening

- Intensive “auditory integration”
- It uses a combination of electronically altered music on CD's
- The listening program is individualized for each person and must be used under the close supervision of a trained therapist
- The time for listening can vary from up to 30 minutes once a day to 30 minutes twice a day depending on the individualized program



## Therapeutic Listening is claimed to improve:

- Sensitivity to sounds
- Attention and focus
- Organization of behavior
- Regulation of the body
- Sleep/wake cycles
- Balance, posture and midline control
- Bilateral coordination
- Concepts of space & time
- Body awareness
- Motor planning/praxis
- Fine motor coordination (i.e.- handwriting)
- Gross motor coordination and sequencing
- Articulation and language skills
- Emotional expression
- Social skills

# American Academy of Audiology

- There has been recent interest in the treatment of autism through a technique of auditory training called "Auditory Integration Training" developed by Guy Berard. Many **parents of autistic children are extremely hopeful**, through claims of success of the technique, that their child will experience a cure.
- This **treatment is also claimed to be successful with people who have dyslexia, learning disabilities, pervasive development delays, attention deficit disorder, and bipolar disorders.**
- There are **no published results of peer reviewed studies using controlled populations and using scientific methods** that demonstrated whether this auditory training program provides significant improvement in any dimension for any population.
- Be it resolved that The American Academy of Audiology believes **Auditory Integration Training (by any name) to be entirely investigational.**
- The Academy believes that prospective, systematic research of this technique is needed to demonstrate its efficacy. Pursuant to Principle 5 of the Code of Ethics, the Academy believes that **the experimental status of this technique must be clearly explained to consumers** before they are entered into treatment.
- Source: <http://www.audiology.org/professional/positions/ait.php>

# Educational Kinesiology

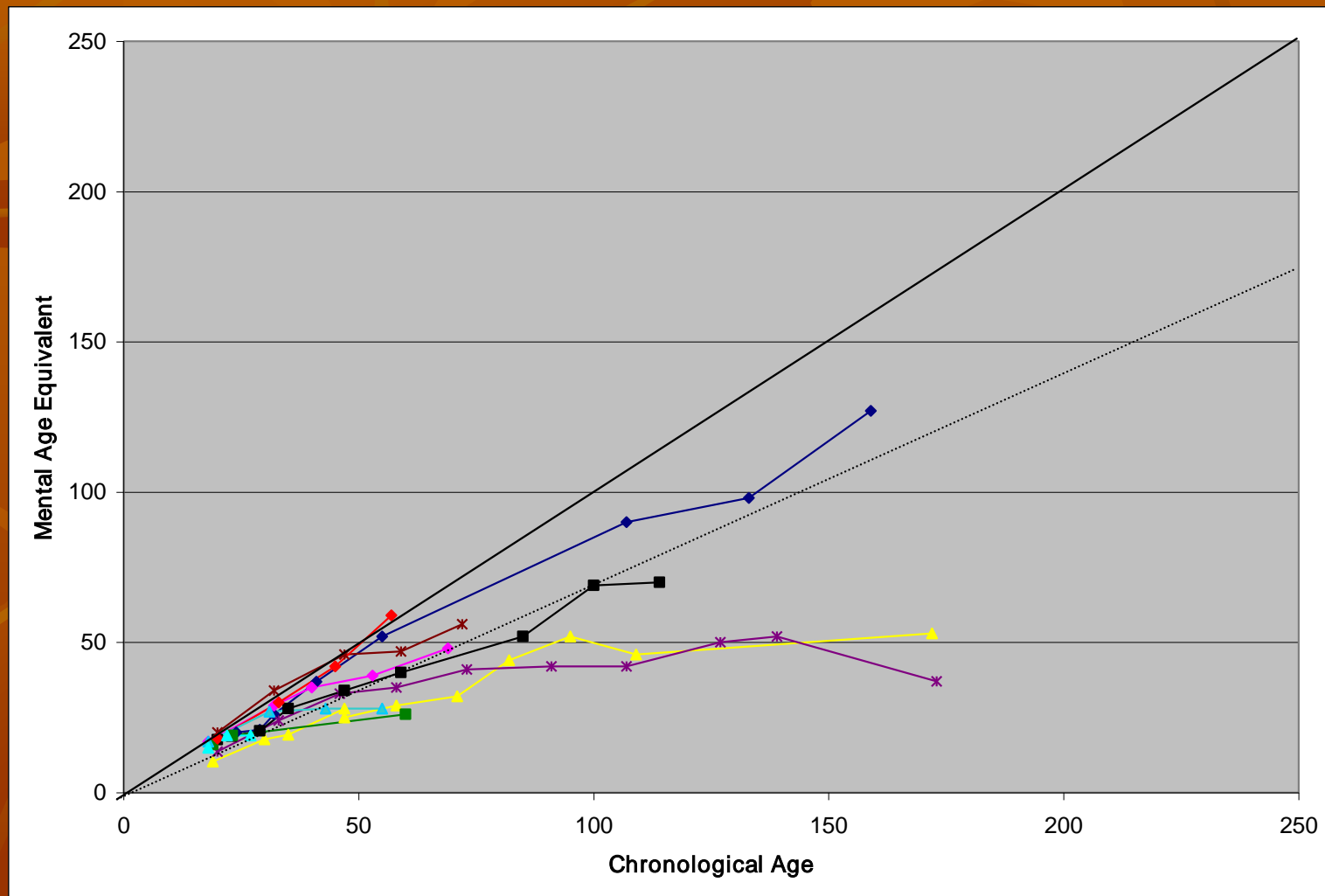
- **Educational Kinesiology with learning disabled children: an efficacy study.**

**Cammissa KM.**

Department of Occupational Therapy, Medical College of Georgia, Augusta 30912.

**Educational Kinesiology is a treatment using specific movements to access different parts of the brain in maximizing learning potential.** It has been recommended for use with learning disabled children; however, studies validating its effects are limited. The school records of 25 students each with a diagnosis of specific learning disability were examined for pre- and posttest scores on academic and perceptual motor skill measures following an Educational Kinesiology program. **Analysis indicated significant improvement in perceptual motor skills following the Educational Kinesiology program. The change in academic skills was not significant.** Educational Kinesiology is recommended as a treatment to improve perceptual motor function of learning disabled children. Other variables affecting this study as well as clinical and research implications are discussed.

# Most LD kids still gain *some* skills over time



# Hypothetical Tetris “LD”

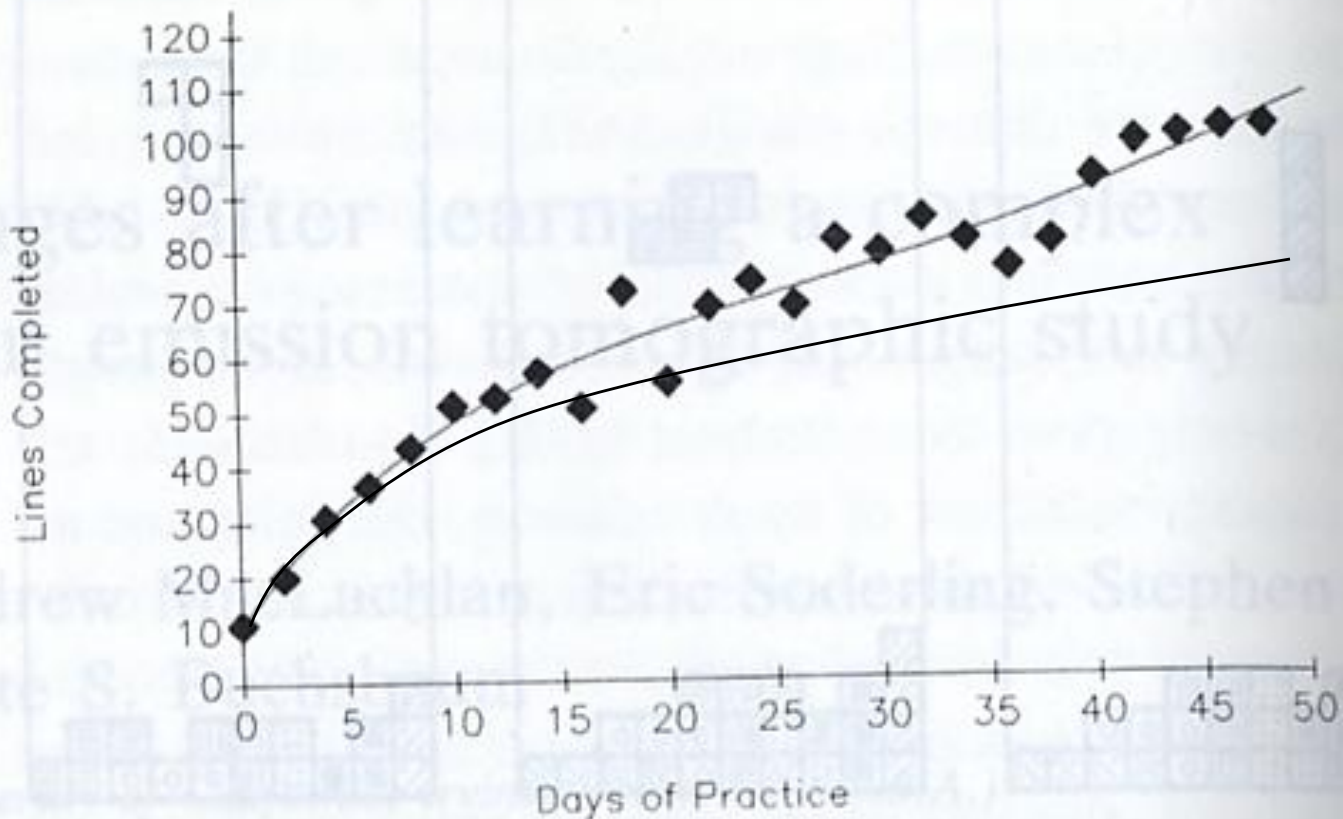


Fig. 2. Tetris learning curve. Plots average score (lines completed) at each practice session. Some later sessions included fewer subjects.



# Effective Interventions

- Based on a rational, theoretical foundation
- Have survived scrutiny by “friendly” and “unfriendly” professionals
- Have withstand comparison to alternatives and waitlists
- Produce changes that outlast novelty and placebo effects
- Have minimal or no practitioner effects
- Have been replicated
- Are probably narrow in scope of effect
- Are consistent with knowledge about how the brain and body function



# Examples

- Depression - Cognitive Behavioral Therapy
- Autism – Discrete trial learning through Applied Behavioral Analysis
- Dyslexia – Orton-Gillingham or similar phonetic based methods
- Developmental apraxia - occupational therapy

# Examples

- Speech disorders - targeted speech therapy
- ADHD - stimulant medication, environmental modifications
- Anxiety – Cognitive Behavioral Therapy

# General principles of effective intervention

- Think “R E P S”
  - Repeated
  - Effortful
  - Practice
  - Sessions
- Repeated need not mean “boring”
- Effortful need not mean “difficult”

# General Summary

- Teachers tend to have a strong normative base for recognizing problems in children
- Referral is necessary when you have a question you can't answer
- Accurate diagnosis requires good assessment
- Accurate diagnosis guides effective treatment
- Many, many effective interventions are known and understood
- There are no therapeutic “bank-shots” (e.g., crawling does not = reading)
- *Brains learn what you teach them!*

# Good online sources

- [www.interventioncentral.org](http://www.interventioncentral.org)
- [www.ldonline.org](http://www.ldonline.org)
- <http://www.schoolpsychology.net/>

# Discussion questions

- How do teachers in your school identify children with special needs?
- Is there a referral process in place here?
- What level of accommodation is it appropriate for an independent school to provide?
- How is your mission different from that of a public school?





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