

Understanding the Impact of ADHD, LD & Executive Function Deficits on Academics & Behavior!

ADHD Conference
Riyadh, Saudi Arabia October 26, 2008

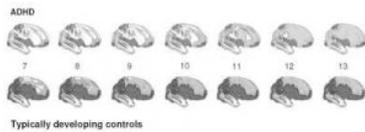
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Slower Brain Maturation

In children with ADHD, the cortex reached peak thickness at age 10.5 years, compared with 7.5 years with normal children. The cortex thickening peaks during childhood, then starts to thin after puberty as unused neural connections are pruned.



Dr. Philip Shaw, NIH, NIMH (2007)

Slower Brain Maturation

Contributes to
deficits in Executive Functions
(30-50 percent)

Has significant impact on academic performance

Executive Function

Definition:

“Actions we perform to ourselves and direct at ourselves so as to accomplish self-control, goal-directed behavior, and the maximization of future outcomes.”

Russell Barkley, Ph.D.

Executive Function

Management functions of the brain

in other words, the

“conductor of the orchestra!”



Tom Brown, PhD



Executive Function

“the brain’s C.E.O.”



This control center,
really an array of executive functions,
orchestrates resources like memory, language, and
attention to achieve a goal,
be it a fraction of a second
or five years from now.

New York Times 8/26/03



Executive Function *(components)*

Impact on Academics & Behavior

- ◆ **W**orking memory
- ◆ **A**lertness, activation, and effort
- ◆ **R**econstitution—analysis and synthesis

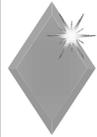
- ◆ Internalizing language (self-talk)
- ◆ Controlling emotions



Executive Function *Practically Speaking*

Children with EF Deficits have difficulty:

- ◆ getting started and finishing work
- ◆ remember chores and assignments
- ◆ memorizing multiplication tables
- ◆ writing essays
- ◆ remembering what they read
- ◆ controlling emotions
- ◆ analyzing and problem solving
- ◆ planning for the future



Executive Function



Having a high IQ is not enough to
succeed in school!
Executive function is a must!

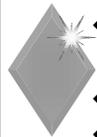


The good news...



Executive function skills
continue to mature
until the early 30s or 40s!

Russell Barkley, PhD & Martha Denckla, MD

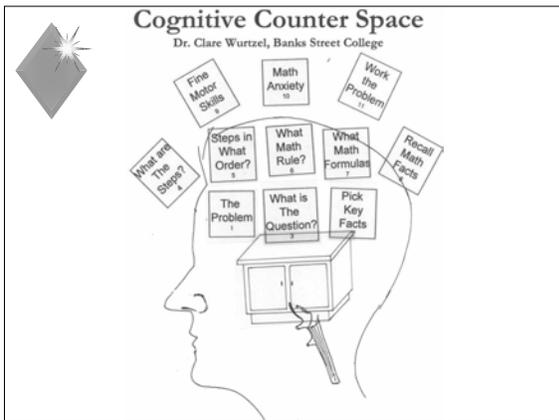
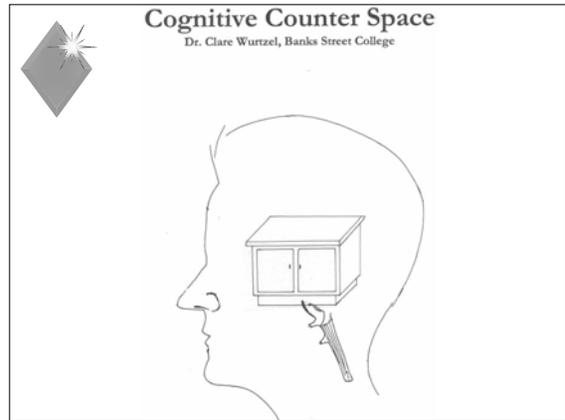
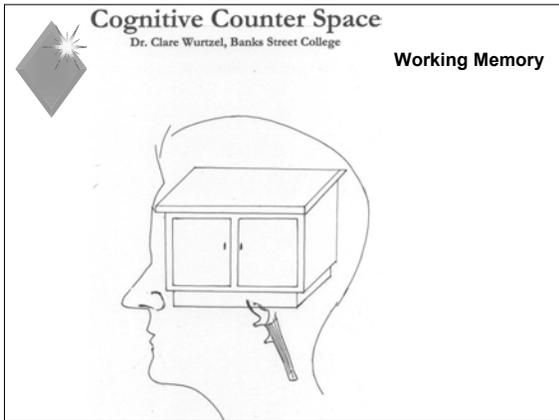


Maturation of Executive Functions!

Executive functions continue to mature....

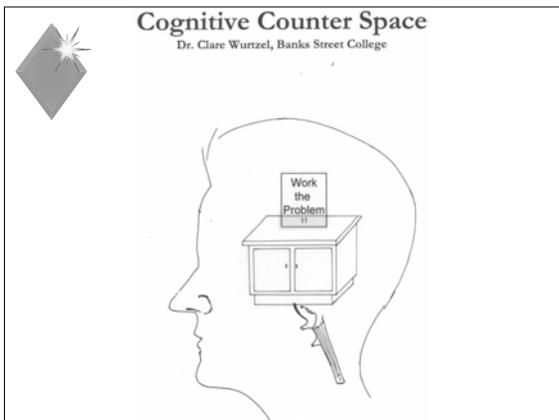
- ◆ a maturational spurt from 17-25
(frontal lobes don’t mature until 25 for most)
- ◆ for some, continues into the early 30s
- ◆ lastly, myelinization completed from 40-50s
(growth in myelin on axon; better conduction
of electrical impulses)

Denckla, Giedd, Barkley



It is critical to....

reduce demands on limited memory capacity!!



- BRIEF**
Behavior Rating Inventory of Executive Function
Gerard A. Gioia, Ph.D.
- ◆ Inhibiting
 - ◆ Shifting
 - ◆ Controlling emotions
 - ◆ Organizing Materials
 - ◆ Initiating
 - ◆ Working Memory
 - ◆ Planning & Organizing
 - ◆ Monitoring



WISC IV Subtests & EF

- ◆ **Working Memory Index (WMI) & subtests—**
 - ◆ *Letter Number Sequence*
 - ◆ *Digit Span (backward)*
 - ◆ *Arithmetic*
- ◆ **Other subtests & working memory**
 - ◆ *Matrix Reasoning*
 - ◆ *Picture Concepts*
- ◆ **Working Memory plus Recall/info Retrieval**
 - ◆ *Vocabulary*
 - ◆ *Information*
- ◆ **Slow Processing Speed/Fine Motor Coord.**
 - ◆ *Coding*
 - ◆ *Symbol Search*



Executive Function Deficits...

Impact Key Skills!



Executive Function Deficits...

have a huge impact on
Memory!



Absent-minded Professor (forgetful)



Memory (Three Forms)

- **Short-term Memory**
 - briefly hold information in mind - 20 sec.
 - limited capacity -- 7 numbers
- **Working Memory**
 - temporary place to store info while ideas are developed further, manipulated, used
 - greater than ST but smaller than LT
- **Long-term Memory**
 - where facts, ideas, & skills are stored forever, ideally
 - consolidation or filing info takes hours/days
 - consolidation occurs during sleep & elaboration



Tips to Improve Memory

(Deshler – make information meaningful)

1. **Linking episodic & semantic** information improves LT memory
Easier to remember episodic events/pictures
Hands on activities also provide this link
2. **Connection** to prior knowledge
3. **Elaboration** of information > LT memory
4. **Mnemonics** (memory tricks) > LT memory
5. **Organization** of information > LT recall
Graphic organizers are helpful.

Times Tables the Fun Way



Remember: When 4 is with 4 the fours become a 4 by 4 (4x4) and you have to be 16 to drive it.

322 | Appendix A

Appendix A3 Student Outline for Writing an Essay

I. **Thesis Paragraph (Topic—Mentor)**

A. Definition _____

B. Importance _____

C. Thesis key words _____

II. **First Supporting Paragraph**

A. Topic sentence (1st half) _____

B. Supporting examples _____

C. Transition to next paragraph _____

III. **Second Supporting Paragraph**

A. Topic sentence (2nd half) _____

B. Supporting examples _____

C. Transition to next paragraph _____

IV. **Third Supporting Paragraph**

A. Topic sentence (3rd half) _____

B. Supporting examples _____

C. Transition to next paragraph _____

V. **Conclusion**

A. Restate the importance of having a mentor _____

B. Restate the three key character traits _____

C. Explain what difference a mentor would make in your life _____

Developed by Merry Merryman, English Department, Paul Robeson Middle School, Los Angeles, CA.

Memory Strategies
(Deshler and Levine)

- ◆ **Rehearsal**; write or say information
- ◆ **Mnemonics**; tricks to aid memory
 - ◆ **Acronyms**: Great Lakes, “HOMES”
 - ◆ **Acrostics**: planets, “My Very Educated Mother Just Sent Us Nine Pizzas.”
 - ◆ **Choral Response**: rhyme/beat, Rap Tape
 - ◆ **Chunking**: divide into smaller categories
- ◆ **Contextual Cues**; use word in sent.
- ◆ **Key Word**: tie known info & unknown

Key Word + Mnemonic
Allied Powers (Allied vans)

Allied Vans



Mnemonic/acronym
FIRE

- ◆ France
- ◆ Italy
- ◆ Russia
- ◆ England

Mastropiero

Memory Strategies
(continued—Jones & Zentall)

- ◆ **Mental Visualization**; find meaningful words within larger word
 - ◆ “opulent”: OP clothes, opal, lent \$
 - ◆ key: student picks association
- ◆ **Imagery**; exaggerate mental picture
 - ◆ “Bay of Pigs”, “How a Bill becomes Law”
- ◆ **Color Cues**
 - ◆ Highlight corrected response
 - ◆ Code test info: nouns-blue; verbs-pink
- ◆ **Loci Method**; label familiar as new info

Memory Strategies
(continued — Clare Jones)

- ◆ **Great Auditory Mimics**;
 - ◆ They trick us; so we think they know it.
- ◆ **Analyze, organize, & elaborate**
 - ◆ Type into computer. Print it out.
 - ◆ Take out letters; do they recognize it?
 - ◆ Print it out. Cut it up. Put together again.
 - ◆ Arrange scrabble letters to spell it again.
 - ◆ Find examples in life; room (kit.), magazines
- ◆ **Visual Posting (GA educator)**

*Sometimes,
we adults make moral judgments
about EF Deficits because.....*



children with EF deficits
look like they have made
a conscious choice to be
lazy and unmotivated!

*Just as
children with math deficits must be
taught skills & given accommodations,*

children with EF Deficits
must also be taught skills & given
accommodations!

Address in the Educational Plan

*Children will do well
if they can!!*

vs

Children will do well
if they try harder.

Dr. Ross Green

*Please!!
Do not punish a student for
characteristics of the disorder!*

Teach skills!!!
Teach to compensate!!!
Provide accommodations!!

ADD/ADHD: Lessons Learned

- ◆ May be very complex!
- ◆ May be mild, moderate, or severe!
 - ◆ May coexist!
- ◆ May include EF Deficits!

- ◆ May be a disability!
- ◆ Should be addressed in IEP/504!

What Lessons Have You Learned?

1. Take home messages?
2. Ah-ha moments?
3. Implications?
4. New information?