Agenda

- Why is Working Memory Training Salient?
- What is Working Memory?
- How would you define and describe it?
- How does it differ from Long Term Memory & Short Term memory?
- Are there any interventions for WM that work?
- How do you implement them?
**Working Memory: What does it consist of?**

How does it differ from other types of memory?

Is it the same as Attention? Or Simple Recall?

Is it the same as Long-Term memory?

Is it the same as Short-Term Memory?

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**Structure of Long-Term Memory**

- **Long-term memory**
  - **declarative memory**
    - **semantic memory**
      - General understanding
      - Factual knowledge (Education)
    - **episodic memory**
      - Personal life (temporally and spatially classification)
      - Public life (important events, celebrities)
  - **Non-declarative memory**
    - **procedural memory**
      - Practical routines
Procedural memory

Working Memory

What is it? How is it defined?
Why is it important?
What is working memory? How does it differ from other types of memory?

Working Memory: Definition

WM requires the manipulation of stimuli - not just the repetition of visual or auditory input.

It may involve re-ordering, or regrouping or applying information learned in order to problems solve...
Working memory impacts your daily life

Working memory is used for...

- Concentration
- Problem solving
- Remembering tasks
- Organization

Multiple failure points in the life of the working memory deprived

<table>
<thead>
<tr>
<th>Age</th>
<th>School</th>
<th>Higher Education</th>
<th>Career</th>
</tr>
</thead>
<tbody>
<tr>
<td>Challenge</td>
<td>Fitting in</td>
<td>Learning to read</td>
<td>Getting into college</td>
</tr>
</tbody>
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5/22/2017
Working memory acts on underlying levels

Skill/behavior
- Reading comprehension
- Math skills
- Language development
- On-task behavior

Influences
- Rate of learning
- Manipulating information
- Remembering directions
- Concentration

Executive function
- Working memory
- Planning
- Attention
- Tasks
- Organizing

Working Memory and Academic Achievement
WM and Academic Achievement

Key facts about the correlation between working memory and learning.

- linked to **key learning outcomes** in literacy, numeracy and beyond
- General **learning difficulties** (i.e. forgetting instructions, place keeping errors, missing key information.
- working memory at 5 years old is a **better predictor of academic success** than IQ
- linked to a number of emotional and **behavioral problems**
- **Reading** comprehension and **math** difficulties

Working Memory and Learning

- **Poor WM affects about 15% of children.** (Gathercole & Alloway, 2008).
- **Children with poor WM make poor academic progress:** Over 80% of children with poor WM **struggle with math and reading** (Gathercole & Alloway, 2008).
- **WM is important for successful learning in individual classroom activities** (Gathercole & Alloway, 2008)
- **WM ability predicted attainment** on national assessments at 7, 11, 14 years of age (Gathercole et al., 2004; St Clair Thompson & Gathercole, 2006).
- People of **lower WM capacity mind-wander more than people of higher WM capacity** when activities require considerable effort and focused concentration (Kane et al. 2007).
Identifying signs of working memory constraints

- Is easily distracted when doing something not highly interesting
- Has trouble waiting his/her turn
- Struggles with reading comprehension
- Struggles doing math calculations in his/her head
- Struggles with getting started
- Struggles with completing a task
- Difficulties when planning and organizing something with multiple steps
- Often seems restless and on the go
- Loses belongings frequently

Working Memory in the Classroom

Working Memory Deficits present academic and behavioral problems.

Teacher Descriptions of Students:

- Unfocused
- Not listening to instructions
- Daydreaming
- Hyperactive or Impulsive
- Unmotivated
- Procrastination
- Difficulty remembering reading passages
- Inability to memorize facts
- Inability to break down word problems
- Inability to write coherently
- Lack of participation
- Forgetful

5/22/2017
Classroom Strategies

Working Memory Deficits present academic and behavioral problems.

**Educational Strategies**

- Repetition and Review
- Breaking down information or instructions
- Provide memory aids and visual supports
- Playing visual or auditory memory games

Computerized Interventions
Interventions used to support students
Computer based support

**Cogmed**
Computer based intervention for working memory
Provides exercises that working memory and related functions

**Dybuster Calcularis**
Computer based intervention for dyscalculia
Software designed to target math

What is Cogmed?
An adaptive, online training program proven to increase working memory – which underlies Attention, Behavior, and the Capacity to learn
- Working memory is linked to key learning outcomes in literacy, numeracy and beyond
  - Over 80% of students who complete the Cogmed training see improvement of over 30% in working memory
  - Wide range of applicability – ADHD, Dyslexia, ELL, Title I, “504 accommodation” students
  - Over 60 published studies on Cogmed benefits
Cogmed Training Outcomes

Cogmed is the most researched method for strengthening Working Memory. Has been demonstrated to improve:

- **Attention**
- **Behavior**
- **Capacity to learn**

“Cogmed ABCs”

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What makes Cogmed work?

1. **Scientific** – designed by leading neuroscientists
2. **Adaptive** – in real time
3. **Intensive** – hard work
4. **Sustained** – consecutive training
5. **Supported** – your coach will be there
6. **Targeted** – wm only
Three programs for Cogmed training

Cogmed JM
preschoolers

Cogmed RM
school-age
children

Cogmed QM
adults

All the products share the same underlying design - the only difference is in the user interface

Cogmed Training – the basics

Training done at school - Mac, PC, IPAD or Android

Supported by a coach/teacher from the school

Choose protocol appropriate for your student - length of time and number of days per week

The results tracked online in the Cogmed Coaching Center
Cogmed is a highly structured, supportive process

2. Start-up session
3. Training and Coaching
4. Wrap-up session
5. Follow-Up Session (Optional)

For more information go to http://cogmed.com/

Track the students with detailed reporting

Reporting Features

**Trends Reporting**
Gives coaches the opportunity to look at consolidated data from multiple trainings on three levels.
- Compliance
- Motivation
- Validity

**Individual Reporting**
Coaches have the option to review individual performance data and training results for each student and print out a progress report for that student.

For more information go to http://cogmed.com/
Track the students with detailed reporting

Key research findings for Cogmed

1. Working memory is key to **attention**, executive function
2. Working memory can be **improved** by training, using right tool/protocol
3. Working memory can be improved at all **age levels**
4. The improvement can be tracked by on **three levels**: fMRI/PET, neuropsych testing, and by rating scales
5. Improved working memory **generalizes** to behavioral improvement
6. The behavioral improvement is **sustained**
7. Training effects are pronounced in **populations with a WM constraint**, effects not limited to ADHD

For more information go to http://cogmed.com/
What is Dybuster Calcularis?

Dybuster Calcularis is mathematical learning software for school and home. Dybuster Calcularis lays a solid foundation for mathematics and can be integrated easily in the day-to-day activities of the school

- 17 different learning games - in a total of 48 different varieties
- Supports neuronal processing of numbers and promote the development of basic mathematical skills
- Adapts to the users capability
- Students can work independently
- Teachers and students can track their progress online.
- Evidence Based training

Dybuster Calcularis?
For more information go to: Pearsonclinical.com/DybusterCalcularis

Thank you!

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