Processing Deficits, Specialized Instruction and Accommodations

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IDEAS Conference
St. Simons Island, GA
June 2013
1. What are processing deficits, and how do these deficits impact how a child learns?
2. What does specialized instruction look like?
3. What is the difference between specialized instruction and accommodations?
Learning Targets

- I can identify characteristics of processing deficits.
- I can identify specialized instruction interventions to help a student compensate for a processing deficit.
- I can state accommodations teachers can use to "level the playing field" for a student's processing deficit.
Processing Areas (7 + 1 + 1)

1) Verbal Reasoning
2) Nonverbal/Fluid Reasoning
3) Short-term Memory
4) Long-term Memory
5) Visual Processing
6) Auditory Processing
7) Processing Speed
8) Executive Functioning
9) Visual-motor Integration
Watch this in action:

**Visual Perception Activity - YouTube**

Specially Designed Instruction means adapting, as appropriate to the needs of the eligible child..., the

- Content
- Methodology or
- Delivery of instruction

- To address the unique needs of the child that result from the child’s disability and
- To ensure access of the child to the general curriculum, so that the child can meet the educational standards...that apply to all children
What does Specialized Instruction look like?

- Specialized instruction is what the teacher does to instruct a child with a disability based upon the child’s unique, individualized needs.

- Adapting
  - Content
  - Methodology
  - Delivery of Instruction
How do we “adapt, as appropriate to the needs of the eligible child”?

- We must **know** the unique, individualized needs of each child
  - Processing profile – and how that impacts learning
  - Educational impact of medical conditions or sensory issues
  - Strengths and weaknesses
    - Academic achievement
    - Language development/communication
    - Functional skills
    - Behavioral and social skills
    - Emotional development
    - Motor skills
How do we “adapt, as appropriate to the needs of the eligible child”?

- We must ask ourselves:
  - What makes this child different from typical learners?
  - How do I teach this child differently in order to meet his/her needs?

- Students receiving special education services need something different from what all students receive in general education.
What is an Accommodation?

- Accommodations may be organizational (e.g., modify instructional day, modify class schedule, more time to pass in hallways, or adjust class environment).... OR

- Alternative teacher strategies (e.g., more time on tests, oral testing, individualize homework, utilize technology, or modify materials).... OR

- Modify building climate for health (e.g., for wheelchair access, administer medications, or accommodate special diets).
Here we go...

- Processing area – what it is…
- Processing area – what it looks like…
- Processing area – what can you do? (Specialized Instruction and/or Accommodations)
Definition: This area refers to the breadth and depth of a person’s acquired knowledge of a culture and the ability to verbally communicate and reason based on this knowledge.

Basically considered as an individual’s knowledge of vocabulary and language proficiency.

NOTE: Usually speech-language pathologists are helpful in remediating this area.
A weakness in verbal reasoning is likely to interfere in the student’s skills for learning vocabulary, comprehending oral and written language, and applying prior knowledge.

You may notice: 1) gaps in skills, 2) problems finding the main idea, 3) offering ‘off topic’ or seemingly random responses, and/or 4) difficulties learning vocabulary

Most obvious classroom indication – WEAK ORAL & WRITTEN EXPRESSION
Verbal Reasoning - What can you do?

**Specialized Instruction**
- Link to prior knowledge
- Pre-teach or preview vocabulary
- Teach vocabulary strategies
- Activate prior knowledge
- Use semantic mapping

**Accommodations**
- Allow use of graphic organizers
- Provide cues for summarization
- Provide word banks
- Provide a glossary of important terms
This area refers to the mental operations that an individual uses when faced with a relatively novel task that cannot be performed automatically.

These mental operations may include such tasks as forming and recognizing concepts, perceiving relationships among patterns, drawing inferences, comprehending implications, and/or problem solving.

Nonverbal Reasoning – What is it?
A deficit in nonverbal reasoning is likely to result in difficulties with creating solutions, solving unique problems, thinking conceptually, drawing inferences, problem-solving through rule application, and generalizing information.

Important skill in developing proficiency in math and social development.

You may notice: 1) difficulties generalizing/making connections, 2) limited problem-solving skills, 3) difficulty seeing the big picture, 4) problems with perspective-taking

Most obvious classroom implications – MISREADS NONVERBAL CUES AND DOESN’T DISPLAY GOOD NUMBER SENSE
Nonverbal Reasoning - What can you do?

**Specialized Instruction**
- Teach student to use procedural checklists for math solution processes
- Teach students to break large tasks into steps – backward plan
- Use metacognitive modeling

**Accommodations**
- Provide note taking assistance
- Allow/suggest use of word processor
- Give step-by-step directions presented visually and/or auditorily
- Allow extended time for writing assignments and tests
Short-term Memory — What is it?

- This area is referring to the ability to apprehend and hold information in immediate awareness and then use it within a few seconds. Short-term memory is a limited-capacity system.

- All learning is considered dependent upon short-term memory.

- Includes the narrow areas of memory span and working memory.
Memory span is important in spelling.

Working memory is important in development of written expression, reading comprehension, and math problem solving.

You may notice: 1) difficulty with multi-step directions/problems, 2) problems copying, 3) difficulty sequencing ideas, 4) trouble with initial mastery of material.

Most obvious classroom implication – CAN’T FOLLOW DIRECTIONS
Short-term Memory — You try it
Follow all four instructions below to solve each of the three problems.

• Multiply the third number in the first row by the seventh number in the third row.

• Add this result to the fifth number in the second row.

• Add to this total ten times the fourth number in the third row.

• Subtract the eighth number in the first row from the result.

Problem 1
6 5 8 7 4 5 6 8 4
3 2 1 9 5 6 4 2 1
6 5 1 5 1 3 2 3 5

Problem 2
7 5 4 9 9 5 4 4 1
2 5 1 4 8 9 6 6 8
5 7 5 7 5 7 6 8 2

Problem 3
1 2 3 7 6 5 4 3 2
8 4 3 2 1 6 5 4 8
6 5 5 8 1 7 5 12 6

Source:
http://www.pbs.org/wgbh/misunderstoodminds/math.html
# Short-term Memory - What can you do?

## Specialized Instruction
- Summarize information in multiple modalities (Think-Pair-Share)
- Teach mnemonic aids
- Teach the use of drawings to aid memory
- Model/think-aloud procedural steps
- Teach note taking strategies

## Accommodations
- Provide note taking assistance
- Reduce spelling penalty on in-class assignments
- Break down tasks into manageable parts
- Allow color coding
- Allow use of checklist for step processes
This area refers to the ability to store information in – and fluently retrieve new or previously acquired information (e.g., concepts, ideas, items, names) from – long term memory.

It is not considered an individual’s store of acquired knowledge, but rather the efficiency with which this information is initially stored in and later retrieved from long-term memory.
• Effective or ineffective system for storing information for rapid retrieval later

• Possible problems with input (associating new information with prior learning) and with output (retrieving the information when needed)

• **Most obvious classroom indication:** POOR TEST PERFORMANCE

• Negatively impacts all subjects; is particularly important in developing reading fluency and knowledge of math facts.
## What can you do?

<table>
<thead>
<tr>
<th>Specialized Instruction</th>
<th>Accommodations</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Teach summarization strategies</td>
<td>- Provide formula cards, checklists, lists of steps</td>
</tr>
<tr>
<td>- Teach linking strategies</td>
<td>- Create word banks on appropriate areas of tests</td>
</tr>
<tr>
<td>- Teach color coding techniques</td>
<td>- Use repetition</td>
</tr>
<tr>
<td>- Model/think aloud procedural steps</td>
<td>- Break tasks into manageable parts</td>
</tr>
<tr>
<td></td>
<td>- Use graphic organizers</td>
</tr>
</tbody>
</table>
This area is considered the ability to generate, perceive, remember, and think with visual patterns and stimuli.

These abilities are typically measured by tasks that require the perception and manipulation of visual shapes and form(s) (e.g., seeing letters and numbers correctly is one type of visual-spatial skill that is essential for reading).
Discrimination
- Ability to perceive visual patterns.
- Most obvious classroom indication – DIFFICULTIES WITH COLOR, SHAPE, SIZE, AND DIRECTION
- Can negatively impact letter recognition in reading and letter formation and word spacing in writing.

Sequencing
- Putting visual information in order.
- Most obvious classroom indication – SKIPPING LINES IN READING; NOT STAYING IN CORRECT COLUMN IN MATH
Visual Processing – You try it

- **reading decoding.pdf**

- **Auditory and Visual.docx**

Source: How Difficult Can This Be?, A Learning Disabilities Workshop; Richard D. Lavoie, © 1989.
## Visual Processing - What can you do?

<table>
<thead>
<tr>
<th>Specialized Instruction</th>
<th>Accommodations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use active verbalization for best memorization</td>
<td>Provide note taking assistance</td>
</tr>
<tr>
<td>Teach strategies for self-questioning and self-monitoring, verbalizing each step</td>
<td>Reduce penalty for spelling on in-class assignments</td>
</tr>
<tr>
<td>Teach use of checklists for math processes</td>
<td>Color code information presented visually</td>
</tr>
<tr>
<td>Implement parts-to-whole verbal teaching approach</td>
<td>Provide reading guide</td>
</tr>
<tr>
<td></td>
<td>Increase white space</td>
</tr>
</tbody>
</table>
Auditory Processing – What is it?

- This area is referring to the ability to hear and work with different sounds that combine to form words, and to discriminate small differences in patterns of sound and speech.

- Although auditory processing does not require the comprehension of language per se, it is important in the development of language skills.
Auditory Processing – Looks like...

• **Discrimination**
  - Ability to identify differences in sounds
  - Implication in the classroom: **POOR SPELLING & DIFFICULTY WITH WORDS THAT SOUND SIMILAR**

• **Sequencing**
  - Involves analysis & synthesis of sound(s); breaking words into separate phonemes & blending them together
  - Implication in the classroom – **WEAK PHONOLOGICAL AWARENESS.**

• Auditory processing is most important in reading and writing up to grade 3.
### Sound It Out! (an activity from *Language! Trainer Training*)

<table>
<thead>
<tr>
<th>Read It!</th>
<th>Hint</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. SHOCKED CUSSED TOE</td>
<td>person</td>
<td>Jacques Cousteau</td>
</tr>
<tr>
<td>2. SAND TACKLE LAWS</td>
<td>fictional character</td>
<td>Santa Claus</td>
</tr>
<tr>
<td>3. MY GULCH HOARD UN</td>
<td>person</td>
<td>Michael Jordan</td>
</tr>
<tr>
<td>4. MOW BEAD HICK</td>
<td>book</td>
<td>Moby Dick</td>
</tr>
<tr>
<td>5. TALL MISCHIEF HER SUN</td>
<td>person</td>
<td>Thomas Jefferson</td>
</tr>
<tr>
<td>6. CHICK HE TUB AN AN US</td>
<td>product</td>
<td>Chiquita Bananas</td>
</tr>
<tr>
<td>7. THOUGH TIGHT AND HICK</td>
<td>thing</td>
<td>The Titanic</td>
</tr>
<tr>
<td>8. AISLE OH VIEW</td>
<td>phrase</td>
<td>I love you</td>
</tr>
<tr>
<td>9. TUB RAID HEAP HUNC</td>
<td>TV show</td>
<td>The Brady Bunch</td>
</tr>
<tr>
<td>10. CARESS TOUGHER CLUMP US</td>
<td>person</td>
<td>Christopher Columbus</td>
</tr>
<tr>
<td>11. DOCKED HEARSE WHOSE</td>
<td>person</td>
<td>Dr. Seuss</td>
</tr>
<tr>
<td>12. THUMB ILL KEY WAKE OWL LICKS HE</td>
<td>place</td>
<td>The Milky Way Galaxy</td>
</tr>
<tr>
<td>13. AGE ANT HUB BLOWS HEAVEN</td>
<td>fictional character</td>
<td>Agent 007</td>
</tr>
<tr>
<td>14. THESE HOUND DOVE MOO SICK</td>
<td>movie</td>
<td>The Sound of Music</td>
</tr>
<tr>
<td>15. BUCKS SPUN HE</td>
<td>fictional character</td>
<td>Bugs Bunny</td>
</tr>
<tr>
<td>Specialized Instruction</td>
<td>Accommodations</td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------------------------</td>
<td>-----------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Use multisensory approaches to teach decoding, spelling</td>
<td>Note taking assistance</td>
<td></td>
</tr>
<tr>
<td>Preview new vocabulary</td>
<td>Simplify oral directions</td>
<td></td>
</tr>
<tr>
<td>Teach students to use strategies and A.T. devices</td>
<td>Gain student’s attention prior to delivery of</td>
<td></td>
</tr>
<tr>
<td>Use manipulatives</td>
<td>information</td>
<td></td>
</tr>
<tr>
<td>Model use of graphic organizers</td>
<td>Pair visual and auditory cues</td>
<td></td>
</tr>
<tr>
<td>Teach memory strategies</td>
<td>Minimize distractions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Break tasks into sequential steps</td>
<td></td>
</tr>
</tbody>
</table>
This area is considered the ability to fluently and automatically perform cognitive tasks, especially when under pressure to maintain focused attention and concentration.

This is sometimes referred to as “mental quickness.”

Impairment in this ability reduces the efficiency in performing both automatic operations and more complex operations.
Fluency in performance of cognitive tasks

Most obvious classroom implication—RESPONSE IS SLOWER THAN AVERAGE ON ALL TYPES OF TASKS, REGARDLESS OF ASSIGNMENT OR SUBJECT. Likely to result in fatigue and difficulty completing tasks.

Fluency in reading, writing, and math fluency are connected to processing speed.
Processing Speed - What can you do?

Specialized Instruction
- Teach time management strategies

Accommodations
- Allow additional time to complete in-class assignments, tests, writing tasks
- Allow additional time for verbal response
- Provide a cue before the student is called upon to answer
- Eliminate repetitious practice when mastery demonstrated
The Executive Functions act as the brain’s ‘manager,’ helping us organize sensory information and plan appropriate actions.

- Working Memory
- Response Inhibition
- Emotional Control
- Sustained Attention
- Task Initiation
- Planning/Prioritization
- Organization
- Time Management
- Goal-directed Persistence
- Flexibility
- Metacognition
Executive Functioning

- Working Memory (aka: Forgetful)
- Response Inhibition (aka: Impulsive)
- Emotional Control (aka: Moody)
- Sustained Attention (aka: Distractible)
- Task Initiation (aka: Passive)
- Planning/Prioritization (aka: Can’t separate extraneous from important)
- Organization (aka: Messy)
- Time Management (aka: Late or does not finish)
- Goal-Directed Persistence (aka: Quits)
- Flexibility (aka: Can’t handle change in routine)
- Metacognition (aka: Is not reflective)
See for yourself:

http://www.pbs.org/wgbh/misunderstoodminds/experiences/readexp2b.html
What can you do?

**Specialized Instruction**
- Direct Instruction
- Teach social skills
- Teach self monitoring strategies
- Teach organizational strategies
- Teach time management strategies
- Use metacognitive modeling

**Accommodations**
- Use of A.T. – calendars, electronic organizers
- Visual cues
- Visual schedule
- Prepare for transitions
- Break tasks into subtasks with clear deadlines
- Use of timer
- Use color coding
Concentration/Attention

- Difficulty remaining on task
- Difficulty focusing attention in distracting situations
- Disruptive behaviors
- Difficulty organizing materials
Attention/Concentration

http://www.pbs.org/wgbh/misunderstoodminds/experiences/attexp1b.html
What can you do?

**Specialized Instruction**
- Maintain a structured classroom with defined procedures
- Teach
  - Procedural checklists
  - Visual study guides – color coded
  - Self monitoring charts
  - To do lists

**Accommodations**
- Allow preferential seating/defined work space
- Use repetition and check for understanding
- Provide study guides
- Use visual timer
- Allow use of formula cards, checklists, graphic organizers, visual study aides, etc.
Visual-Motor Integration/Spatial Ability

- Difficulties with fine and gross motor tasks and with tracking in reading and math.

- Most obvious classroom implication – ILLEGIBLE HANDWRITING AND CLUMSINESS.

- Occupational therapists may assist with these problems
Visual Motor Integration – You try it

- Star Activity
  - Try tracing the star while looking in the mirror.
## What can you do?

### Specialized Instruction
- Use highlighters, bumped lines to create stronger visual of line location
- Model use of graphic organizers
- Teach, model and practice color coding text for organization

### Accommodations
- Provide organizational assistance
- Assistive technology
- Provide note taking assistance
- Provide extended time for writing
- Suggest use of graph paper or paper with vertical lines for alignment of problems
**Essential Questions?**

1. What are processing deficits and how do these deficits impact how a child learns?
2. What does specialized instruction look like?
3. What is the difference between specialized instruction and accommodations?
Resources

- Richard Lavoie: How Difficult Can This Be? F.A.T. City--A Learning Disabilities Workshop
- LD Online  www.ldonline.org
- Misunderstood Minds Online  http://www.pbs.org/wgbh/misunderstoodminds
- Language! Teacher Resource Guide, Cambium Learning Group
- Processing Deficits, Specialized Instruction and Accommodations: Presentation by Sandy DeMuth and Shelia Autrey
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