Today's Agenda:

- Definitions
- Visual (Motor)
- Auditory
- Sensory

Underlying Processing Abilities

OCCMH
Lizeth Lopez
3/17/2015
Definitions

**Processing**
- Perceiving, understanding, & making sense of information

**Integration**
- Taking in information from multiple inputs, combining, & coordinating
Auditory processing is crucial because our learning is heavily reliant on auditory system—think of how teachers teach from early age—talking, singing, etc.

Auditory processing issues can be inherited, or acquired (e.g. by problems at birth, or ear infections when young).
Often seem overlapping symptoms with other mental health issues

- 7-yo girl who is able to pay attention when working one-on-one with an adult. But when there are other children around, she can’t seem to focus and appears distractible, and can’t appear to get long with them. During group discussions, she just stares out the window. People wonder if she has attention deficit disorder.
It is the 14-yo boy who is always forgetful and can’t seem to remember things that his parents have told him. Just the other day, he came home late even though his mother had just reminded him that morning to come home early for his doctor’s appointment. Parents wonder if he’s just being difficult, or if it’s something else.
Case Examples:

- It is the 13-yo girl who prefers to eat alone during lunchtime. She seems okay one on one with classmates, but when she has gone to the cafeteria to eat with classmates, she seems to get confused and can’t seem to follow conversations with other people around. People have wondered if she might have social anxiety disorder. Others have wondered about sensory processing disorder, because she also happens to be very sensitive to noise.
Symptoms can include behaviors suggesting:

- **Decreased hearing**
  - Huh? (Repetition & then get it)
  - Not hearing
- **Unusually sensitive hearing**
  - Higher sensitivity
  - Preference for quiet contexts

- **Speech/Language**
  - Development, quality, pragmatics
  - Difficulties reading or spelling (phonics)
  - Increasing difficulties
- **Impaired Intelligence/Inattention**
  - Difficulty following directions
  - Dislike for reading
  - Slow, spacey
  - Easily confused/frustrated
  - Tuning out/daydreaming

Symptoms can include:
Diminished response to voices or loud noises; difficulty hearing in background noise; needing repetition of info; difficulty understanding speakers with low pitched voices or accents—variability in hearing depending on situation which may then suggest behavioral or attention problems

Sensitive:
Sensitivity to sounds that don’t bother others; preference for quiet and solitary activities over group situations (avoids malls, pools, etc); withdrawn or anxious in noisy environments; perhaps covers ears; reactive

Speech/language:
May have delays; articulation errors; abnormal speaking tone (soft, flat, etc); delays in verbal responding to questions or instructions; difficulty in conversations; reading and spelling difficulties due to weakness in phonics
Increasing difficulties may be observed as classroom demands change and teachers rely more on verbal instruction and teaching
Auditory Discrimination Problems
- Difficulties hearing the difference between sounds or words that are similar
- E.g. pat/pad; rice/rise; coat/boat; sounds such as “ch” or “sh

Auditory Figure-Ground Problems
- Troubles paying attention especially in environments with lots of other sounds and distractions
- This may make the child frustrated when there is too much noise in the classroom

Auditory memory problems:
- Troubles remembering what s/he is told.
- So after being told a set of instructions, the individual may have troubles remembering things right after they are said, or may have troubles remembering it later.
- May not consistently remember addresses, phone numbers, etc. from day to day.
- May not remember how to pronounce letters and words.

Auditory Association Deficit
- Troubles learning sounds of letters and letter names, individual words with categories, etc. May not be able to follow verbal directions, conceptualize the
concepts of words, numbers, etc. May have difficulty classifying objects and ideas presented verbally.

Sound localization and lateralization:
- Knowing where a sound is in space.
- E.g. hearing someone call your name, and figuring out where the person is.

Auditory pattern recognition
- Similarities and differences in the patterns of sounds.
- E.g. apple/appeal; apple/chapel.
- Auditory performance with degraded acoustic signals
- Understanding the spoken word if part of the word is missing.

Auditory Attention Problems:
- Problems in listening long enough to complete a task or requirement (such as listening to a lecture in school). Although health, motivation, and attitude may also affect attention, among other factors, a child with (C)APD is simply unable to maintain attention, and is not simply being lazy or defiant.
Effort in trying to assess impact of noise on difficulties (inattention); does teacher talk a lot, acoustic environment (floors, echoes, noisy fans, heaters, etc)

My biggest considerations...

- Inattentive in certain environments (e.g. school) but not in other contexts (considering impact of noise)
- Noise level in home vs school vs office
- Verbal but seems to mishear
There is a strong relationship between language, language development, auditory skills (including listening), and attention. Therefore, identifying students with auditory processing disorders may be difficult because similar behaviors are exhibited among students with attention deficit hyperactivity disorder (ADHD), hearing loss, or the presence of a specific learning disability.
Strategies for APD’s

- Environment considerations
  - Distance, noise, distractions, acoustics
  - Psychoeducation on how environment can impact sound perception
- Accommodations
  - Focus on listening, therefore minimize other activities (eg. note-taking)
  - Written information provided, visual cues
  - Close-captioning with audiovisual info
- Other considerations
  - Assistive listening devices (teacher mics)
  - Training programs

Sit close to teacher/source of audio input; minimize background noise and auditory distractions (even small things like a fan vent, etc); acoustics (carpets, wall hangings to cover over-echo prone surfaces);
<table>
<thead>
<tr>
<th>TABLE 3 Helping Children with CAPD's</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Background Noise</strong></td>
</tr>
<tr>
<td>Auditory Closure Practice with Noise</td>
</tr>
<tr>
<td>Song Lyrics</td>
</tr>
<tr>
<td>Closed-Captioning</td>
</tr>
<tr>
<td><strong>Discrimination</strong></td>
</tr>
<tr>
<td>Train Discrimination</td>
</tr>
<tr>
<td>Guided Oral Reading</td>
</tr>
<tr>
<td>Auditory Closure</td>
</tr>
<tr>
<td>Closed-Captioning</td>
</tr>
<tr>
<td><strong>Prosody</strong></td>
</tr>
<tr>
<td>Train Music, Pitch</td>
</tr>
<tr>
<td>Train Timing, Rhythm</td>
</tr>
<tr>
<td>Guided Oral Reading</td>
</tr>
<tr>
<td>Poems, Jokes</td>
</tr>
<tr>
<td><strong>Localization</strong></td>
</tr>
<tr>
<td>Train Localization</td>
</tr>
<tr>
<td>Emphasize Visual Cues</td>
</tr>
<tr>
<td>auditory closure</td>
</tr>
<tr>
<td>learn sound acoustics</td>
</tr>
<tr>
<td><strong>Delayed Processing</strong></td>
</tr>
<tr>
<td>Visual Learning</td>
</tr>
<tr>
<td>Visualization</td>
</tr>
<tr>
<td>Chunk Information Key Words</td>
</tr>
<tr>
<td><strong>Memory</strong></td>
</tr>
<tr>
<td>Train auditory memory</td>
</tr>
<tr>
<td>chunk information</td>
</tr>
<tr>
<td>subvocalization</td>
</tr>
<tr>
<td>context, personalize</td>
</tr>
<tr>
<td>visual learning</td>
</tr>
<tr>
<td>visualization</td>
</tr>
<tr>
<td><strong>Hypersensitivity</strong></td>
</tr>
<tr>
<td>Sound Desensitization</td>
</tr>
<tr>
<td>environmental changes</td>
</tr>
<tr>
<td>sparing use of musicians' ear filter</td>
</tr>
<tr>
<td>more time to answer</td>
</tr>
<tr>
<td>online learning</td>
</tr>
<tr>
<td>prepared questions</td>
</tr>
<tr>
<td>teacher's notes</td>
</tr>
<tr>
<td>book at home</td>
</tr>
<tr>
<td>written instructions</td>
</tr>
<tr>
<td>animated teaching</td>
</tr>
<tr>
<td>environmental changes</td>
</tr>
<tr>
<td>carpeted floors</td>
</tr>
<tr>
<td>preferential seating</td>
</tr>
<tr>
<td>visual supports</td>
</tr>
<tr>
<td>teacher's notes</td>
</tr>
<tr>
<td>book at home</td>
</tr>
<tr>
<td>written instructions</td>
</tr>
</tbody>
</table>
Identifying and diagnosing can be tricky, because children seldom complain of or recognize difficulties--- because they don’t know what it is like to see any other way!!
Input Abilities

- Binocular control
  - Eye teaming, convergence, fusion

- Accommodative control
  - Eye focusing, accuracy, agility, amplitude

- Oculomotor control
  - Visual tracking, fixations, pursuits, saccades

Visual Processing Includes:
Spatial: ability to determine that one form or part of a form is turned in a different direction than the others. Position in space makes it difficult for the child to plan actions in relation to objects around him/her; difficulty with spatial concepts such as “in, out, on, under, next to, up, down, in front of;” difficulty differentiating between “b, d, p, q;” leads to poor sight vocabulary; contributes to difficulty reading charts, maps and diagrams; results in inconsistent symbol reversals and transposing numbers or letters, and losing place on a page; difficulty finding what is being looked for, attending to a task, remembering left and right, math computations if more than one digit; and forgets where to start reading.

**Visual Sequential Memory**—the ability to remember a series of forms and find it among four other series of forms; Visual sequential memory reflects a child’s ability to recall a series or sequence of forms. Functionally, this skill would influence a child’s ability to sequence letters or numbers in words or math problems, remember the alphabet in sequence, copy from one place to another (e.g., from board, from book, from one side of the paper to the other), spell, perform math, retrieve words with reversals or when out of order, and remember order of events after reading (which affects reading comprehension). The child would also tend to forget assignments and forget steps that are shown in an activity.
**Visual-discrimination** - Visual discrimination refers to a child’s ability to differentiate between objects and forms. It gives us the ability to notice subtle differences and to identify if something does or does not belong. For example, this skill is important for identifying and exchanging money, and matching and sorting objects. A deficit in this area may contribute to problems in dressing (i.e., matching shoes or socks), correcting errors in school work, distinguishing similarities and differences in the formation of letters (i.e., letter reversal) or objects, discriminating between size of letters and objects, and matching two dimension to three dimension such as alphabet letters.

**Visual Form Constancy** - which is the ability to see a form and find it among other forms, although it may be sized different or rotated; Visual form constancy reflects a child’s ability to recognize forms, letters, or words regardless of their orientation (i.e., if a form were upside down, sideways, inverted, etc.). A deficit in this area would make reading difficult as the child might not recognize familiar letters when presented in different styles of print (fonts, size, or color); result in being slower to master the alphabet in numbers;
**Visual Memory** - Visual memory reflects the child’s ability to store visual details of what has been seen in the short-term memory. If details aren’t stored, there will also be difficulty accurately recalling, and in some instances reproducing, all of the characteristics of a given item. Functionally, a visual-memory deficit may make reproducing figures (letters, numbers, shapes or symbols) from memory causing the child to mix lower and uppercase letters. Deficits also influence copying from a text or chalkboard, replicating information on worksheets and tests, comprehending reading, dialing a phone number, remembering sight words, transferring learned words from one medium to another, remembering what was read, reproducing figures from memory.

**Visual Closure** - Visual closure reflects a child’s ability to look at an incomplete shape, object or amount, and fill in the missing details in order to identify what it would be if it were complete. This skill requires abstract problem solving. Functionally, visual closure impacts a student’s ability to write, to use worksheets or test forms that are poorly photocopied, copy something if he/she cannot see the complete presentation of what is to be copied, complete partially drawn pictures or stencils, spell, complete assignments, complete dot-to-dot worksheets or puzzles, identify mistakes in written material, perform mathematics (including geometry), and solve puzzles.
Visual Figure-Ground—the ability to perceive a form and find it hidden in a conglomerated ground of matter; Visual figure-ground refers to the ability to locate and identify shapes and objects embedded in a busy visual environment, or the ability to attend to one activity without being distracted by other surrounding stimuli. A child with a deficit in this area may have difficulty attending to a word on a printed page due to his/her inability to block out other words around it, difficulty filtering out visual distractions such as colorful bulletin boards or movement in the room in order to attend to the task at hand, difficulty sorting and organizing personal belongings (may appear disorganized or careless in work), over attend to details and miss “big picture”, or overlooks details and misses important information (e.g., word recognition, locating one object within a group, finding place on the page or skips pages and sections, noticing punctuation), difficulty copying from the board and may omit segments of words, difficulty recognizing misformed letters and uneven spacing, difficulty with hidden picture activities, may lack visual search strategies, have difficulty locating a friend on the playground or finding a specific item in a cluttered desk. An issue with visual figure ground also reflects attention and focus, which makes it difficult to complete seatwork.
In assessment I will ask or try to observe child reading and writing
During reading- do they move their head instead of their eyes, notice distance and position of how hold stimuli as reading; do they lose place during reading or have to use finger to keep track; misreading words or numbers or frequent guessing; letter confusion and rotation (not just b for d, but b for q, p,)

Writing: Spacing between letters and words, formation of letters, staying inside lines; are they spelling phonetically
Behavioral symptoms might also include:

- Frequent eye rubbing
- Squinting
- Head tilting
- Eye fatigue/irritation
- Telling time
- Finding items in cluttered background
- Eyes do not seem coordinated
- Difficulty recognizing visual info
- Focus on small details versus larger picture
- Poor coordination/"clumsy"
Can also impact interpersonal functioning:

- Miss social cues (facial expressions)
- Difficulty following conversation
- Difficulty facial recognition
- Poor eye contact
Can mimic attention problems in that often include:

- Visual distractibility
- Frequent errors
- Missing visual details
- Slower pace of work
- Boredom/ fatigues easily when reading or writing
- Errors in copying work
- Avoids task with heavy visual demands
Visual Processing Compensatory Strategies:

- Visual Perceptual Deficits.doc
Sensory Processing
Sensory Processing Disorder

- *Sensory Processing Disorder (SPD)* is a condition that exists when sensory signals *don’t* get organized into appropriate responses....a neurological "traffic jam" that prevents certain parts of the brain from receiving the information needed to interpret sensory information correctly (Ayers, 1999).

- A person with SPD finds it difficult to process and act upon information received through the senses,
  - creates challenges in performing countless everyday tasks

Donna
https://www.youtube.com/watch?v=1_luj8dr9oY
**Tactile:** the sense of touch; input from the skin receptors about touch, pressure, temperature, pain and movement of the hairs on the skin.

**Auditory:** input relating to sounds; one’s ability to correctly perceive, discriminate, process and respond to sounds.

**Taste:** input relating to the mouth; one’s ability to correctly perceive, discriminate, process and respond to input within the mouth.

**Smell:** input relating to smell; one’s ability to correctly perceive, discriminate, process and respond to different odors.

**Visual:** input relating to sight; one’s ability to correctly perceive, discriminate, process and respond to what one sees.
- **Vestibular**: the sense of movement; input from the inner ear about equilibrium, gravitational changes, movement experiences and position in space.
- **Proprioception**: the sense of "position"; input from the muscles and joints about body position, weight, pressure, stretch, movement and changes in position.
Impact on Learning

- Coordination problems
- Poor attention span or difficulty focusing on tasks
- Academic-related problems such as poor handwriting and difficulty cutting with scissors
- Problems with self-care skills such as tying shoes, zipping
- Low self-esteem
- Over-sensitivity to touch, sight, or sounds
- Unusually high or low activity level

Donna
1. don’t know what source of stimulus is or where its coming from. What-type discrimination problems can involve any sensory system. Where-type discrimination problems are difficulties in localizing sources of sensory stimulation either in 3d space or personal body map.

2. Difficulty in regulating amount of sensory info that enters conscious awareness. May sound like selective attention but different; don’t just face competition among various stimuli for attention rather they experience real sense of danger and threat

3. Need additional sensory stimulation; seek abnormally intense or frequent stimulation of various senses. Have difficulty in processing position and pressure cues they receive from balance and touch receptors; actively seek movements to stimulate balance, touch, and position sensors.

3 Categories of Behaviors

1. Impaired sensory discrimination
   - Difficulty identifying nature or source of sensory stimulation
   - What versus where

2. Impaired sensory regulation
   - too much or little information in conscious awareness (under- versus over-responsive)

3. Sensory-seeking behaviors
### Sensory Processing Disorder Related Behaviors

#### Vision
- Sensitivity to lights, colors, etc.
- Difficulty with visual discrimination
- Overstimulation of visual stimuli
- Difficulty maintaining eye contact

#### Hearing
- CAPDs common in kids with SPD
- Hypersensitivity to sounds
- Reactivity to noises
- Easily distracted by even faint noises
- Speak in unusual tones/pitch
Some kids may react with hostility to affection; avoid being hugged; overreact to slightly being bumped. Others may tolerate deep pressure but avoid light caresses. Grooming such as hair brushing may be an issue, bathing, brushing teeth, cutting fingernails, etc. Textures- finger painting, sand, grass.
Sensory Processing Disorder Related Behaviors

**Taste & Smell**
- Picky eaters
- Sensitive sense of smell and over-reactive
- Difficulty detecting smells
Sensory Processing Disorder Related Behaviors

**Balance, body, position & movement**
- Clumsy
- Avoids certain movements (swing, etc)
- Anxiety in crowded situations or unstable surfaces
- Difficulty with stairs/escalators
- Difficulty learning to ride bike, skip, jump, etc
- Motion sickness
- Sensory seeking seek out intense movements
Sensorimotor Integration

- Developmental delays
- Postural muscle support and tone
- Gross-motor control problems
- Fine-motor control problems

Difficulty in learning to walk, roll over, controlling head, sitting up, etc; crawling often begins late; delays in speech, eating, swallowing

Sitting posture- muscle support and tone
Kids with SPD often have difficulties in regulation and controlling emotions

Sensory regulation is closely related to emotional regulation. Intense emotional responses may be because they are interpreting input as danger. Brain works in fight or flight reaction; automatic below level of conscious awareness
Impacted social functioning

- Sensory confusion can also relate to missing social cues
- May appear odd or different
- Sensitive may lead to reactivity, avoidance, immaturity
Targeted therapy with controlled sensory stimulation and carefully coordinated sensory and motor responses, rewiring brain. Most helpful activities involve both isolated and multimodal sensory inputs.

Goal to strengthen individual sensory and motor maps to help integrate them with each other.

Hope Network
Kid at Heart
Important steps

- Making world more sensory-friendly
- Manage sensory-seeking behaviors
- Manage sensory-avoidance behaviors
- Improve whole-body balance and movement
- Improve fine-motor function
- Improve emotional regulation
One of my faves...