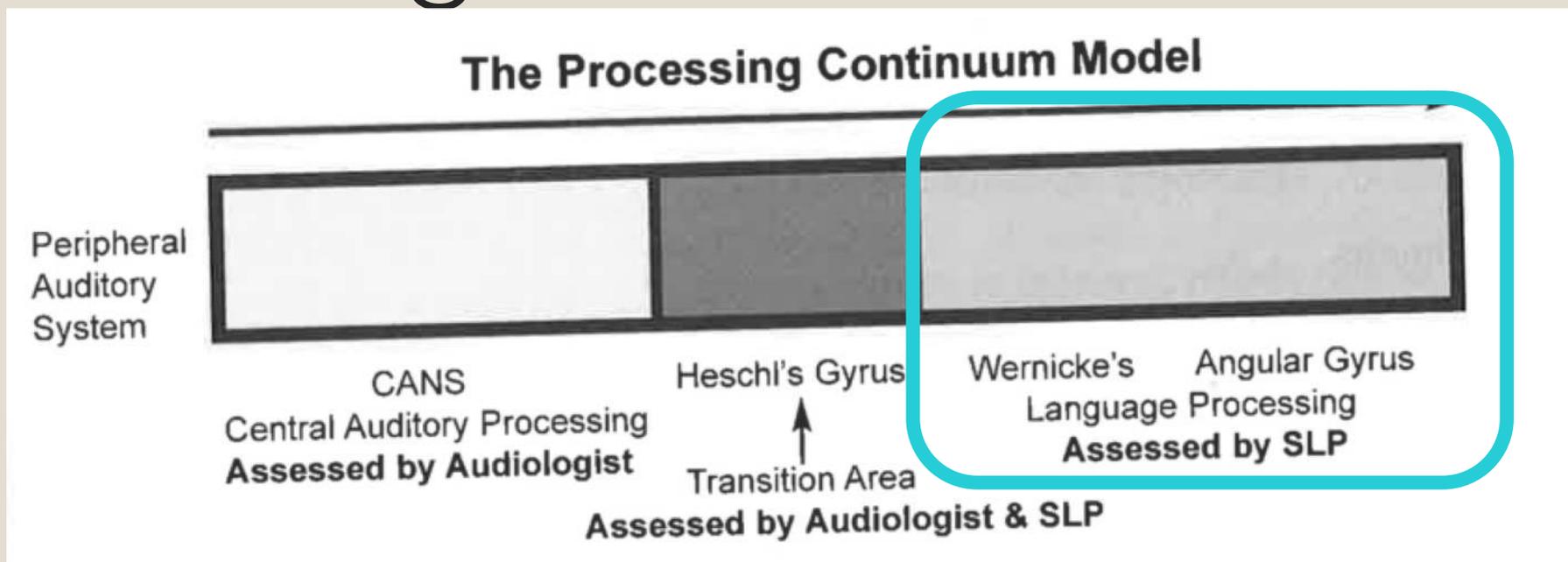




LANGUAGE PROCESSING

By Kathleen Trainor

Processing Continuum



Phonological
Testing

- PAT
- CTOPP
- TAPS

Definition

- Top- Down Processing
 - Use knowledge of language and the world to interpret acoustic signal
 - Stresses comprehension
 - Focus is on language/semantic knowledge
- Ability to attach meaning to an auditory signal using parameters of the linguistic system such as semantic knowledge
- “Pure” language processing disorder cannot be attributed to other major disorders but people with those disorders (ADHD, cognitive impairment, autism, etc...) may demonstrate characteristics of it
- It is a difficulty in accessing language ability already acquired and efficiently integrating basic foundational language skills to formulate more complex thoughts and responses.

Characteristics you may see

- Playing the teachers game without understanding the reasons – students try to please the teacher by going through the motions but don't know why so no actual learning has occurred
- Instruction exceeds a child's short-term memory loop. With auditory only information, kids with processing problems have little hope of completing tasks correctly
- Auditory information can be overwhelming – children instead just check-out
- Children have meaning mapped onto a vocabulary term, but don't understand how the meaning may change based on the situation.
 - EX: omen and sign are synonyms in many contexts but not in baseball

Characteristics you may see

- Children who are quite verbal but don't say much
 - EX: then this one team beat this other team at some kind of game
- Phonemic confusion – words that sound similar but have very different meanings
 - EX: specific vs. pacific
- Difficulty with multiple meaning words and colloquial language – meanings change based on context or current trends
- Problems with humor, irony, puns – abstract language
- Children do poorly on tests and quizzes even though they have been able to tell you the information – often due to how the questions have been worded
- Day-dreaming, confusion, frequent “I don't know” or “I forgot”
- Impulsive responses and jumping to conclusions

HELP HELP! MY HEAD
SOMEHOW GOT TWISTED
COMPLETELY AROUND!
I'M FACING BACKWARD!



LOOK! I CAN READ
THE TAG ON MY SHIRT!
I CAN SEE DOWN
MY OWN BACK!



...OH, WAIT. THERE'S MY
BELLY BUTTON. I MUST
JUST HAVE MY *SHIRT* ON
BACKWARD.



<http://gocomics.com/calvinandhobbes>

Common Problems

- Retrieval of common words – I'm meeting that lady at the place
 - Facilitating retrieval of stored information
 - Still have to identify if word has been learned and retrieval is the problem or if word has not been learned
- Use of neutral, generic, or less-specific labels
 - Often uses category labels rather than specific nouns, "things" or "stuff"
- Misuse of words with similar phonetic structure
 - Smiling on the mirror rather than in the mirror
- Generating creative, original language terms or circumlocutions
 - Quacking birds – ducks; the yellow stick that you write with, put in that thing over there and turn the handle to make it real pointed

Common Problems

- Response time – use fillers to buy time
 - Ummm, you know – keeps their turn until they have finished attaching meaning
- Frequent “I don’t know” or “I forgot”
 - Children become anxious about holding up the class – I don’t know takes the pressure off and teacher moves on to someone else
- Inconsistency in learning
 - When knowledge is presented with lots of examples and demonstrations – students are focused; this new knowledge might not get stored in a very organized manner if at all to retrieve and use again for the next day
 - Content has to be taught all over or requires extensive review
 - Problem – organized storage into long-term memory for later use
 - Integration of new and old information doesn’t go smoothly

Common Problems

- Recognize language errors but can't fix them
 - Good idea to group kids – learn to better understand and recognize their own errors from perceiving them in other students
- Incomplete sentences or thoughts
 - Disjointed pieces of information have meaning for the student but they don't fill in the context and gaps for the listener
- Pragmatic problems; disruptive behavior
 - Frustration – have the knowledge but can't access it
 - Withdrawal – avoid embarrassment of unsuccessful academic attempts
- Age-commensurate IQ – academic deficits; SLD label
 - 'swiss cheese' pattern of learning – uneven language foundation that tends to collapse as language demands increase

Precursors for Language Processing Problems

- Poor sequencing in receptive and expressive language
- Slow acquisition of vocabulary and concepts
- Ineffective short term memory
- Slow receptive and expressive acquisition of 'wh' question forms
- Delayed articulation/phonological development
- Significant word retrieval problems
- Slow syntactic development with persistent error patterns
- Slow pragmatic development with poor awareness of conversational rules

Language Processing Assessment

- Abilities develop in a hierarchy of increased cognitive complexity
 - Think about normal child development
- Nouns – labels
- Verbs – functions
- Associations
- Categorization
- Similarities
- Differences
- Multiple Meanings
 - Each area is a pre-requisite for the other – kids can't group items if they don't know what they are, what they do, or when they are used
- Generally focused on semantic complexity – intervention should then take place at the earliest level of deficit

Assessment

- Must have ruled out
 - Acoustic signal issues – hearing screening
 - Acquisition of basic receptive/expressive language skills – PPVT
 - Intellectual functioning – must be within normal limits
- Only auditory stimuli
- Evaluate language complexity in subtest tasks
- Discrete, isolated language tasks
- Increase processing demand to include complex language tasks
- Progress to multi-modality input to assess integrated language tasks
- Also assess:
 - Auditory Memory deficits (7-10 items)
 - Word retrieval – efficiency and accuracy

Assessment tools

- ***PPVT** - baseline for child's lexicon, cannot expect children to process language at a level higher than their basic lexicon
- ***Language Processing Test (LPT)** – arranged in hierarchy of language complexity; allows the clinician to interpret the level of processing breakdown. Evaluates beginning pre-school levels through elementary school age levels
- ***Word Test** – higher level processing than on the LPT; may have same names as LPT but tasks are vary different and require very different levels of language complexity
- **Listening Test** – auditory only; higher level than LPT – questions assess integrated language problem solving, reasoning and comprehension of information presented with auditory only input
- ***Test of Problem Solving** – goes to higher level – incorporating several language processing skills for integrated processing

Language Processing Test (LPT)

Pretest 1: Labeling Subject correctly names pictures.

Score	Acceptable Responses
1 0	1. shoe
1 0	2. toothbrush
1 0	3. fork
1 0	4. book
1 0	5. money, cash, dollars and coins
1 0	6. soap, bar soap, soap dish
1 0	7. milk, milk carton / carton of milk, gallon / jug of milk
1 0	8. key, car / house key

Pretest 2: Stating Functions Subject correctly states function.

Score	Acceptable Responses
1 0	1. shoe wear, put on, walk / run in it
1 0	2. toothbrush brush / clean / scrub / wash teeth
1 0	3. fork eat, pick up food
1 0	4. book read, listen to story, look at pictures
1 0	5. money spend, earn, donate, save, buy, pay, put in bank / wallet / billfold / purse / pocket
1 0	6. soap wash, clean, scrub, shower, bath
1 0	7. milk drink
1 0	8. key lock, unlock, open

Subtest C: Similarities Subject names one similarity.

Score	Response
1 0	_____ 1. sink bathtub
1 0	_____ 2. car bus
1 0	_____ 3. chair couch
1 0	_____ 4. stove refrigerator
1 0	_____ 5. toes fingers

Subtest D: Differences Subject names one difference.

Score	Response
1 0	_____
1 0	_____
1 0	_____
1 0	_____
1 0	_____

Subtest A: Associations Subject names one commonly associated noun.

Score	Acceptable Responses
1 0	1. shoe sock, foot, another shoe, its mate
1 0	2. toothbrush toothpaste, teeth, floss
1 0	3. fork spoon, knife, plate
1 0	4. book library, book bag, backpack, school, desk, bookmark
1 0	5. money bank, ATM, wallet, billfold, purse, pocket, register, piggy bank
1 0	6. soap water, sink, shower, tub, washcloth, washrag, rag, loofah, dish, holder
1 0	7. milk glass, cup, straw, bottle, cereal, cookie
1 0	8. key lock, door, doorknob, door handle, keyhole, key chain / ring
1 0	9. scissors paper, glue, cloth, ribbon, string, thread
1 0	10. bread butter, jelly, jam, peanut butter, mayonnaise, mustard, meat, cheese, lettuce
1 0	11. bed pillow, pillowcase, blanket, sheets, bedspread, covers
1 0	12. pencil eraser, paper, pen, lead, sharpener

____ Total for Subtest A

Subtest E: Multiple Meanings (Do not administer to 5.0 - 5.11 year olds.) Subject gives three different meanings for a word.

Score	Response	Score	Response
1 0	1. rose a. Ask <u>rose</u> to call me. + - b. The sun <u>rose</u> over the mountains. + - c. Put the <u>rose</u> in a vase. + -	1 0	7. break a. Don't <u>break</u> the glass. + - b. Let's take a 10-minute <u>break</u> . + - c. Brian could <u>break</u> the world record. + -
1 0	2. bat a. It's your turn to <u>bat</u> . + - b. A <u>bat</u> flew out of the cave. + - c. Jason brought his new <u>bat</u> to the game. + -	1 0	8. light a. Sean gave his friend a <u>light</u> tap on the shoulder. + - b. My suitcase feels <u>light</u> . + - c. Erin wore a <u>light</u> blue shirt. + -

Subtest B: Categorization Subject names three distinctly different items.

Score	Response	Score	Response
1 0	1. colors _____	1 0	3. musical instruments _____
1 0	2. body parts _____	1 0	4. things that take you places _____

Subtest F: Attributes Subject describes each item.

Score	Item	Function	Parts	Color	Accessory / Necessity	Size / Shape	Category	Composition	Location / Origin
	Demo	1 0	1 0	1 0	1 0	1 0	1 0	1 0	1 0
	horse	Verbatim Response: _____							
	1. watermelon	1 0	1 0	1 0	1 0	1 0	1 0	1 0	1 0
	watermelon	Verbatim Response: _____							

Task 1

- Name all the animals you can in 1 minute
- What happened when you got stuck?
 - You may have gone to sub-categories, recalled a recent trip to the zoo or aquarium, may have begun to think of features of animals, or gone through the alphabet to name an animal with each letter
- Lessons:
 - Additional knowledge was present even though quickness slowed down or stopped momentarily – didn't mean language knowledge was depleted
 - You knew what to do to cue retrieval of language – you have learned strategies that you self-applied to keep yourself productive
 - You might have used other modalities to compensate – visualized, features, etc...

Task 2

- Name the capitals of Illinois, New Mexico, and California
- What happened when you got stuck?
 - You may have gone to sub-categories, recalled a recent trip to the zoo or aquarium, may have begun to think of features of animals, or gone through the alphabet to name an animal with each letter
- Lessons:
 - Additional knowledge was present even though quickness slowed down or stopped momentarily – didn't mean language knowledge was depleted
 - You knew what to do to cue retrieval of language – you have learned strategies that you self-applied to keep yourself productive
 - You might have used other modalities to compensate – visualized, features, etc...

Task 3

- Recall a conversation you have been in with several people. Was there a point where you had a question but it would be rude to interrupt and by the time you could interject you forgot what you were going to say?
- What did you do to retrieve the comment?
- Lessons:
 - You knew how to retrieve the information and could apply that strategy effectively within the situation
 - Constant attention was counterproductive – you needed a ‘time-out’ to collect your thoughts
 - Associative context was the best strategy to recall the forgotten language information

Task 4

- Recall a situation when your thinking was timed – ACT, GRE, etc...
- Did the timing give you confidence and make you feel good about your answers or did you walk out frustrated that you had rushed, not gotten to some questions or experienced anxiety that you might not finish?
- Lessons:
 - Timed learning during the developmental years add more pressure and compromise careful effort for children with processing problems
 - Timed tests send a message that thinking should be automatic and fast as opposed to careful and deliberate
 - Timed tasks do not necessarily make children feel good about their performance or confident about their answers

General Treatment Principles

- Initial goal is always accuracy
- Efficiency or speed in processing is secondary
- Need to teach how to carefully organize information as it is encoded and stored to facilitate later retrieval
- Therapy should help the student figure out which associative retrieval strategies work and then take the time to make sure the information is organized when encoding and it goes into long-term memory so it can be retrieved accurately and efficiently
- Once these strategies are identified – the student can learn to ask themselves the same questions which facilitates self-retrieval strategies

Guidelines for Therapy

- Use evaluation results to determine the level of language processing development
- Begin at the earliest level which difficulty was encountered, regardless of whether or not higher level skills are intact
- Begin at the first level of difficulty and solidify that language processing skill before progressing to the next one
- Begin with multi-modality input gradually moving toward auditory only input
- Order goals/deficit areas into language levels of cognitive complexity
- Start with discrete language skills and work into more integrated language skills
 - Generalize into more functional activities
- Think hierarchy; impose levels of language complexity on your goals
- Impose cues/prompts into remediation – word retrieval strategies are global
- Work in conjunction with the compensatory strategies including word retrieval

Compensatory Teaching Strategies

- Introduce information with a multi-modality approach
 - Information will be stronger if it is experienced with multiple parts of the brain
- Supplement auditory information with visual materials
 - Auditory signal is brief and dissipates with time
- Introduce new material in a context-rich associative environment
 - Retrieval is enhanced by the number and amount of other material attached to new information
 - Avoid introducing disjointed facts that the student must organize
- Provide cues, prompts, or hints to help focus students and facilitate retrieval
 - Additional information, descriptions, first sound, associated features, other items in the category
- Allow 'thinking time'
 - Ask the question and provide the whole group with 'thinking time' – hands don't go up until you give the signal

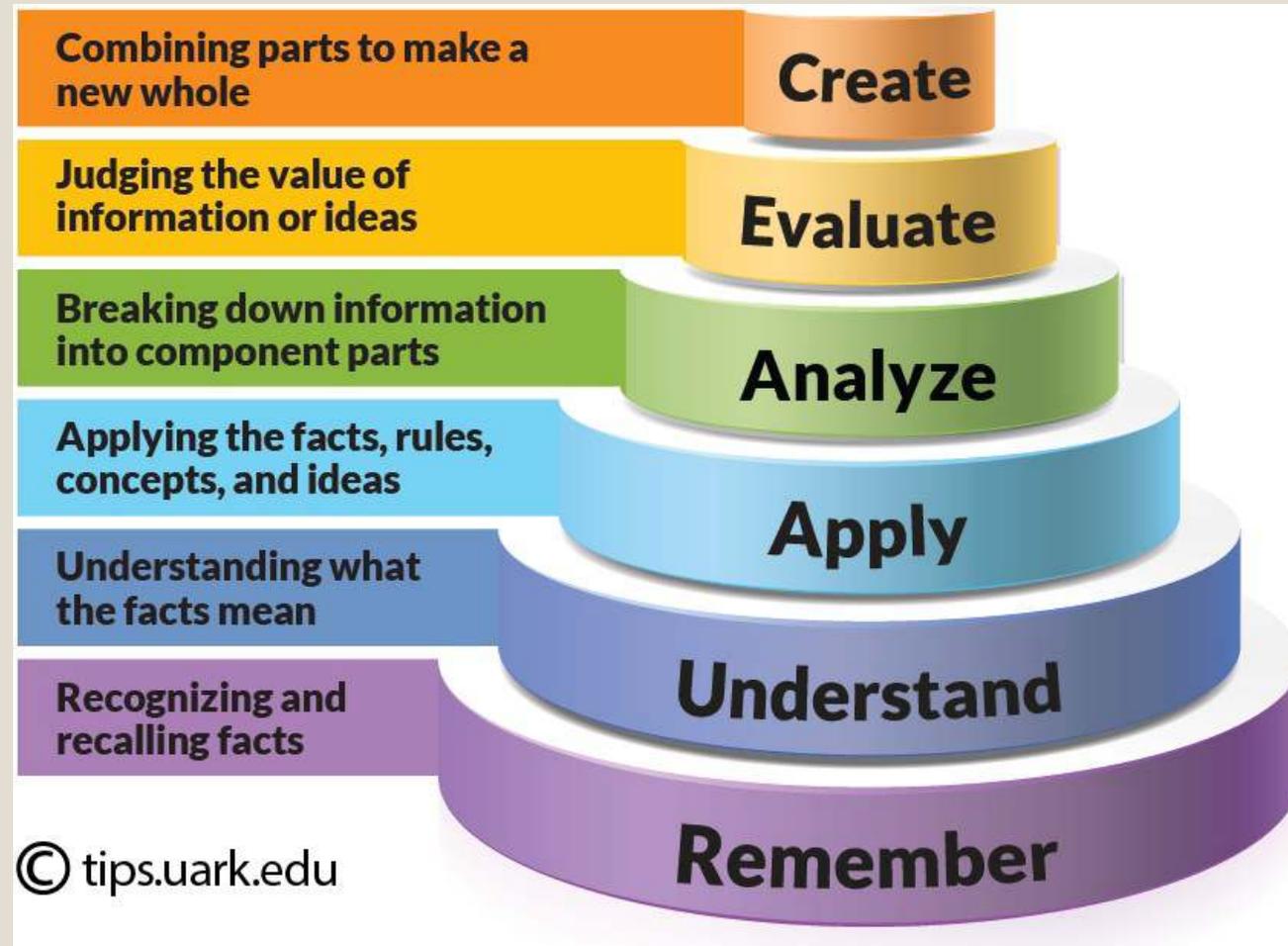
Compensatory Teaching Strategies

- Limit time activities or performance tasks
 - These send the message that you should work quickly rather than accurately
- Shorten length of assignments to focus on accuracy
- Vary the types of responses expected
 - Don't just require total recall; add in multiple choice and other recognition formats
- Refresh stimuli with repetition, rephrasing, and expansion clarifications
 - Every student can benefit from hearing something twice
- Teach stories and examples to associate main points
 - Provide an associative context for new information helps students remember verbal information

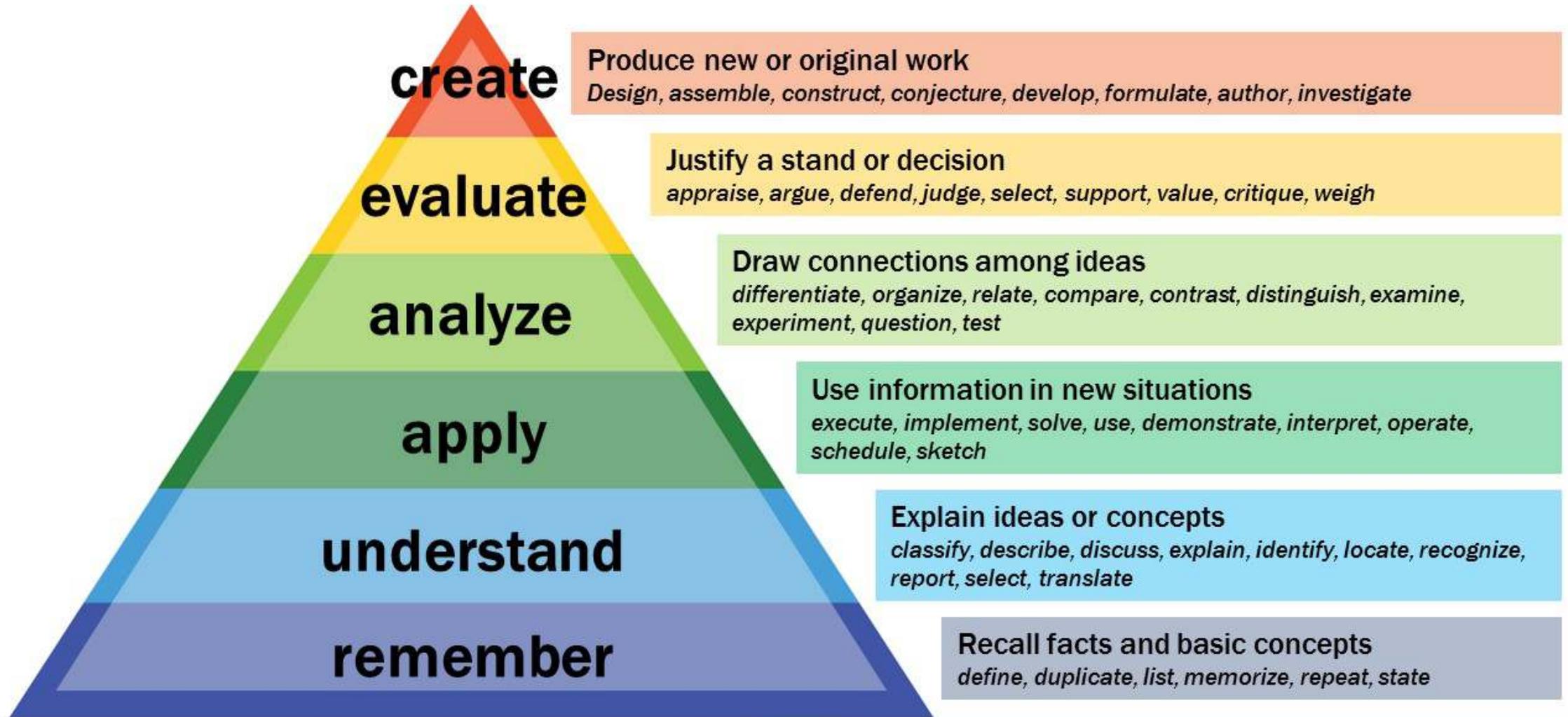
Student Compensatory Strategies

- Request additional time when you need it
- Request cues, prompts, and associative information
- Ask specific questions rather than generic questions
- Apply strategies that work to facilitate retrieval
- State what you do know, then the source of confusion
- Tape record lectures to provide repetition or a more permanent record
- Use rehearsal, paraphrasing, and writing key words to keep processing on track
- Be an active learner rather than a passive learner
- Be patient; take your time, and don't give up or become frustrated
- Seek out study buddies to check information

Bloom's Taxonomy



Bloom's Taxonomy



My experience

- Think of hierarchy of skills – back to normal development
- Can be applied to grammar – want kids to have organized retrieval of these skills as well
- Device organization – WFL is organized by association, harder for us but earlier developing than categories which is how DynaVox is organized
- Use of self-advocacy strategies – help kids learn what cues work for them

 I don't know

- What does it start with?
- Can I have choices?
- Can you tell me the category?
- Can you tell me where you find it?
- Can you describe it to me?
- Can you give me visuals?
- Can you give me more time?

Resources & More information?

- Source for Processing Disorders by Gail Richard
 - Book which discusses auditory and language processing assessment and treatment
- Websites
 - <https://www.additudemag.com/language-processing-disorders-recognizing-symptoms/>
 - <http://www.lsses.org/resources/teacher-consultant-blog/language-processing-disorders-lpd/>