

Metalinguistic Awareness in Chronic Aphasia: Focus on Treatment of Agrammatism

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Session objectives

- As a result of attending this session, participants will be able to:
 - Describe metalinguistic awareness and its relevance to language learning and use
 - Explain underlying issues of agrammatic speech and its impact on communication
 - Select appropriate therapeutic goals and stimuli for treating chronic agrammatism

Disclosure: Naomi Gurevich is employed by Purdue University Fort Wayne. She has no significant non-financial relationships to disclose. Questions should be addressed to: Naomi Gurevich at gurevich@pfw.edu

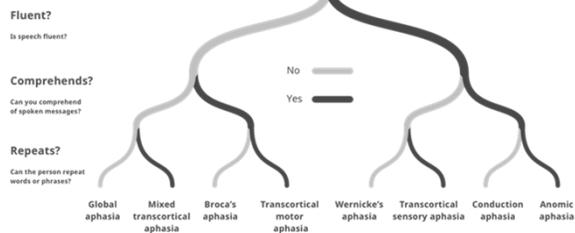
Session Plan

- Background
- Case study
- Materials
- Activity

Aphasia

- Acquired neurologic communication disorder
 - From damage to parts of the brain involved in language
 - Most often d/t stroke
- Primary impairment: expressive & receptive deficits
 - Written & oral expression
 - Reading & auditory comprehension
- Usually relatively intact nonlinguistic cognitive skills
 - Attention/working memory may be involved with linguistic difficulties (e.g., Lee & Sohlberg, 2013)

Types of Aphasia



Aphasia

- Intervention goals
 - Improved communication to increase participation in daily, social and vocational activities
- Acute stage:
 - ~6 months, spontaneous recovery, faster recovery with Tx
 - Typically focus Tx on improving function (restorative)
- Chronic stage:
 - Persists beyond acute stage, slower recovery
 - Tx focus on fxl communication (compensatory)

Aphasia

- Treating chronic stage aphasia
 - Little data on treating this stage (Baso & Macis, 2011)
- Some clinical evidence of Tx benefit for chronic aphasia:
 - Working memory training (e.g., Christensen, Wright & Ratiu, 2018; Majerus, 2017; Zakariás, Salis & Wartenburger, 2018)
 - Using Constraint-induced language therapy (e.g., Szafarski et al., 2015)
 - Group communication (e.g., Elman & Bernstein-Ellis, 1999)
 - Word-finding interventions (e.g., Sebastian & Kiran, 2011)

Agrammatism

- Common in cortical non-fluent aphasia types (Broca's, Transcortical Motor, Global)
- Disordered grammar (e.g., word order, verb omission)
- Telegraphic speech
 - Using fewer words; just content words (E.g., I've had to go to the market.)
 - Function words (red)
 - Words needed for grammar (prepositions, aux verbs, articles)
 - Content words
 - Words with meaning (nouns, verbs, adjectives, adverbs)

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Agrammatism: Them pesky verbs

- Naming verbs poses a greater challenge over naming nouns
 - Verbs have more *syntactic* constraints on their use than nouns
 - *Semantic* information is relevant to syntax (hierarchy of verb argument #s)
 - Intransitive verbs – one argument (subject)
 - E.g., "I am talking"
 - Transitive verbs – two arguments (subject, object)
 - E.g., "Peter ate an apple"
 - Ditransitive verbs – three arguments (subject, direct object, indirect object)
 - E.g., "Jane gave a gift to John"

Agrammatism: Sentence generation

- Verb phrases
 - Retrieval of verb from lexicon
 - Combination of verb with its elements to form verb phrase
 - Movement of the phrase to its location in sentence

Agrammatism: Sentence generation

- Role of comprehension
 - Clinical support that targeting comprehension skills improves sentence production (e.g., Adelt, Hanne & Stadie, 2018)
 - P-chain (Dell & Chang, 2014)
 - Psycholinguistics framework connecting language processing (comprehension) & language production (also language acquisition)
 - Language processing involves anticipation of the semantic properties of upcoming words, which is a function of the language production system
 - >> Experience with comprehension provides experience with production

Agrammatism: Intervention

- Sentence generation and focus on verbs
 - Specificity principle of intervention
 - Compare to anomia (word-finding difficulties, typically focus on nouns)
- Behavioral approaches
 - Target repetition, practice, memory, and learning
- Linguistic approaches
 - Target syntactic complexity, verb argument structure, and underlying linguistic forms

Metalinguistic Awareness

- A type of metacognition
- A cognitive process that allows a person to monitor and control their use of language
- Related to language development (in children) and language acquisition (learning new languages)
 - Assists in learning language structures, and transferring that knowledge to functional tasks

Metalinguistic Awareness

- No published research directly tying it to treating chronic aphasia
- Syntax treatment
 - Working with language structure to improve sentence generation
 - Targeting higher complexity to improve production of lower complexity sentences involving similar structure
 - Treatment of underlying forms (TUF) approach (Thompson & Shapiro, 2005)
 - Complexity account of treatment efficacy (CATE) (Thompson, Shapiro, Kiran & Sobecks, 2003)
 - Sentence construction supports lexical retrieval
 - Content drives structure (COST) (Speer & Wilshire, 2013)

Metalinguistic Awareness

- Big Questions
 - Can (residual or rehabilitated) metalinguistic awareness improve language skills in chronic aphasia?
 - Can metalinguistic awareness be improved in an individual with chronic aphasia?
- Focus of case study
 - Can an activity that taps into metalinguistic awareness improve mod/severe expressive skills of a client with chronic aphasia?

Case study: Client info

- 40yo male, 5yrs post stroke
- Mod/severe chronic agrammatic Broca's aphasia
 - Omissions: verbs & prepositions (e.g., "of", "to") in spontaneous speech
 - Stereotypy: "though", "too", "you know"
- Short mean length of utterance (MLU)
 - Typical MLU of 2-3
 - Speech examples
 - "Yeah change yeah"
 - "Yeah but no"
- Progress had plateaued

Case study: Intervention

- Focus on verbs
 - Cuing to missing verbs is ineffective (he is not "forgetting" a verb is needed)
 - Trouble supplying verb even when directly requested
 - Client understands the need for verbs, but is not regularly using them
- Task
 - All parts of speech to form simple complete sentences provided on cards
 - Client asked to manipulate the cards to form complete sentences

Case study: Intervention

- Supporting sentence construction
 - All parts of speech present, can't omit (relying on *errorless learning* and reduced strain on *working memory* & on comprehension)
 - Have to reorder parts of speech (targeting syntax – relying on *specificity in treatment*)
 - Focusing on word order & syntax (*principles of constraint-induced language treatment (CILT)*)
 - [Prediction] Physically handling parts of speech, reordering them, taps into *metalinguistic awareness*
 - That cognitive process that allows a person to monitor and control their use of language

Case study: Observations

- General observations:
 - Client recognized incorrect order
 - Would move cards around, assess, and repeat until correct
 - Recognized which words could be reordered without affecting grammar
 - E.g., "cats and dogs" vs. "dogs and cats"
 - Clinician sensed improvement
 - Couldn't quantify exactly, but felt MLU might have increased
 - Client enjoyed variations of this task, seemed like confidence increased

Case study: Analysis

- Transcribed client spontaneous speech in treatment sessions
- Used Systematic Analysis of Language Transcripts (SALT) to track:
 - MLU
 - Vocabulary use
 - Type of utterances (e.g., questions, statements)
 - Pauses
- Analyzed first 50 spontaneous utterances (twelve weekly 90-min sessions)
- Documented initiation, sentence complexity, & other verbal behaviors

Case study: Results

- Additional progress documented in later sessions
 - Client finishes sentences with fewer pauses
 - Client using more prepositions in spontaneous speech
 - Client is giving more specific answers to questions

Case study: Conclusion

- Progress after long period of plateau
- Questions remain:
 - Are we expanding metalinguistic awareness or accessing residual metalinguistic awareness to complete the task?
 - How can we distinguish the two?
- Future directions:
 - Replicate results with similar case studies

Materials

- Cards with parts of speech
 - I'll give you basics, you can add your own words
 - Nouns, pronouns, verbs, prepositions, function words (articles, conjunctions)
 - For higher fxn clients add adjectives, adverbs
 - One word per card
 - Need more than one of each preposition, for some task variations need more than one of each pronoun
- Color coordinate parts of speech

Directions

- Prep groups of cards that form sentences
 - Sentence complexity depends on client's function level/needs
 - Complexity hierarchy:
 - Short SVO (e.g., "the sister walked the dog")
 - Adjectives (e.g., "the house is green")
 - Add adjectives to simple SVO sentences (e.g., "my sister walked the white dog")
 - Add more nouns (e.g., "the sister walked the dog and the cat")
 - Add more verbs (e.g., "the sister walked and fed the dog")
 - Arbitrary order ("dog and cat" = "cat and dog") useful to focus on when order matters, when it doesn't
 - Add adverbs, conjunctions, make sentences longer

Directions

- Provide client with group of cards, instruct to move around to form grammatical sentence
- Cue to read aloud and self-correct
- If more than one order is grammatical, instruct client to find

Directions

- For higher function goals, make it more game-like:
 - Option 1:
 - Prepare stacks that form sentences, but have client start with the words facing down and organize based only on parts of speech/colors
 - Turn cards face up - hopefully have a laugh at the result - then reorganize into correct sentences (if needed).
 - Option 2:
 - Shuffle all the cards; client and clinician each draw 6-10 cards, and - like in poker - replace some from the deck and try to make a sentence. The more cards used in the sentence the more points

Directions

- Adding tenses (present, past) and cases (sg., pl., possessive, 3rd person, etc.)
 - Option 1:
 - For lower fcn clients: Keep verbs in present and mostly 1st person & sg. nouns
 - E.g., "I cook dinner"
 - As use of ask improves, add grammar cards (e.g., for verbs "s" for 3rd person sg., "ing" for present continuous or gerund, "ed" for past) & auxiliary verbs (variations of 'to be': "am", "are", "is", "was", "were", and variations of 'to have': "has", "have", "had")
 - Introduce through simple structured activities (e.g., start with "I cook dinner" then switch "I" to "dad" and support adding "s" to verb; add "yesterday" and support tense-related additions)
 - Can have the tense-related cards available separately to draw from as needed (e.g., client gets 3 cards [dad], [cook], and [dinner] and has to recognize that one of the tense cards is needed)

Directions

- Adding tenses (present, past) and cases (sg., pl., possessive, 3rd person, etc.)
 - Option 2:
 - For higher functioning clients (I've used in group sessions) have them draw a certain number of cards from the deck to create the longest sentences they could
 - Instruct to use the default verb card and change to whatever tense is needed for the sentence
 - Like option 1, but without the "safety net": clients expected to make the change mentally, thereby relying more heavily on their familiarity with language - the metalinguistic awareness that supports all of these exercises - and on their working memory skills to make that mental manipulation of grammar

Directions

- Adding tenses (present, past) and cases (sg., pl., possessive, 3rd person, etc.)
 - Option 3:
 - Create cards with the correct tense to use in certain sentences (i.e., make a card for "cooks" or "cooked" to use with "dad" and "dinner").
 - Then support your patient as you challenge skills by adding decision-making about tenses first with tense-related cards (option 1), then more open-ended (option 2).

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