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Spoken Discourse Analysis Resources for Clinicians

Tutorials on Selected Monologue- and Dialogue-Based Discourse Measures:

a) **Total Number of Words and Correct Information Units** (CIUs; Murray et al., 1998; Nicholas & Brookshire, 1993; Saffran et al., 1989)

1. Time the duration of the discourse sample.
2. Transcribe the utterances word for word, but do not include any beginning or ending commentary about starting or finishing the task (e.g., "Well, let's see here"; "I'm not sure how much I'll be able to tell you"; or "That's about all I can say about it.").
3. Calculate the total number of words.
   - Count all intelligible words in context, even if they are not accurately produced (e.g., *hicsup* for *hiccup*).
     i. Include real words that may not make sense in the task (e.g., *stable* for *staple*).
     ii. Include in your count any commentary in the middle of the task (e.g., "Oh, why can't I say that word."), any filler words/phrases (e.g., *okay, you know*), any interjections (e.g., *good grief*), and informal words (e.g., *nope, uh-huh, yeah*).
     iii. Count as two words any shortened forms (e.g., *gonna, hafta, sorta*) and contractions (e.g., *can't, he's*).
     iv. Individually count the words in numbers (e.g., *one hundred ninety-two* = 4 words), proper nouns (e.g., *Mount Saint Helen* = 3 words), and hyphenated words (e.g., *merry-go-round* = 3 words).
     v. Count compound words (e.g., *cowboy, sunshine*) and acronyms (e.g., *VFW, USA*) as one word.
   - Don't count non-word fillers (e.g., *um, hmm*) or unintelligible words in context, such as unintelligible paraphasias or partial words.
4. Calculate the total number of CIUs.
   - Count CIUs: "Correct information units are words that are intelligible in context, accurate in relation to the picture(s) or topic, and relevant to and informative about the content of the picture(s) or the topic" (Nicholas & Brookshire, 1993, p. 348).
   - Count as a correct information unit:
     i. all words intelligible in context, accurate given the topic and/or task, and relevant to the topic and/or task
     ii. count accurate, intelligible, relevant, informative words regardless of grammatical correctness (e.g., wrong verb tense)
     iii. any phonemic paraphasia resulting in an English word that is intelligible in context (e.g., *school* for *stool*)
     iv. the final production in an attempt to correct any sound errors
     v. informal terms that convey meaning (e.g., *yep, nope, yeah*)
     vi. commentary and embellishments that relate to the task or topic (e.g., "Seems like a nice way to spend an afternoon.")
     vii. count each word in a verb phrase as a CIU (e.g., *is leaving* = 2 CIUs)
     viii. count contractions (e.g., *shouldn't*) and colloquialisms (e.g., *hafta*) as 2 separate CIUs
     ix. count separately each word in a hyphenated word (e.g., *mother-in-law*)
   - Do NOT count:
     i. words that do not seem accurate according to the context (picture or topic)
     ii. attempts to accurately produce a word except the final attempt
     iii. false starts or unfinished words/phrases
     iv. repetition of words/phrases/thoughts within the task that don't add meaning or emphasis (count only the first one)

v. pronouns produced without first providing a referent

vi. vague or unspecified words/phrases without a referent (e.g., *thing, something, stuff*, many instances of *here* and *there*)

vii. conjunctions used as filler or continuants (e.g., *so* and *then*)

viii. unnecessary and ambiguous qualifiers and modifiers (e.g., *apparently, I think, sort of*)

ix. filler words and phrases (e.g., *well, I mean*), interjections that don't add meaning (e.g., *oh boy, aha*), and tag questions (e.g., *isn't it*)

x. the conjunction *and*

xi. comments on the task itself or the quality of the stimuli (e.g., "It's hard to see what that is.")

xii. self-reflective comments on the client's performance (e.g., "That's not right.")

5. For Words per Minute: divide the total number of intelligible words by the duration of the sample in minutes. Include pauses but exclude any time the clinician is speaking.
6. For %CIU (informativeness): divide the total number of CIUs by the total number of words and multiply by 100.
7. For CIU/min (efficiency): Calculate the total duration of the sample by subtracting the total time of interruptions by the clinician cues. Then divide the total number of CIUs by the total number of minutes of the sample.

b) **Type-Token Ratio** (Stark et al., 2023)

Calculate the number of different words (types) and divide by the total number of intelligible words (tokens) from a discourse sample. There are a number of websites that can automatically analyze text for types and tokens.

c) **Core Lexicon Analysis** (Dalton et al., 2020; Kim & Wright, 2020b)

- Manual Scoring Procedures and Materials: https://aphasia.talkbank.org/discourse/CoreLexicon/
- Web application: https://rb-cavanaugh.shinyapps.io/coreLexicon/ (Cavanaugh, Dalton, & Richardson, 2021a)

Enter the orthographic transcription of the discourse sample (Broken Window, Cat Rescue, Refused Umbrella, Cinderella, or Sandwich) using the provided rules for an automatic calculation of scores, percentiles, and characteristics.

d) **Main Concept Analysis** (Dalton et al., 2020)

- Manual Scoring Procedures and Materials: https://aphasia.talkbank.org/discourse/MainConcepts/
- Web application: https://rb-cavanaugh.shinyapps.io/mainConcept/ (Cavanaugh, Dalton, & Richardson, 2021b)

Enter the orthographic transcription of the discourse sample (Broken Window, Cat Rescue, Refused Umbrella, Cinderella, or Sandwich) using the provided rules for an automatic calculation of scores, and percentiles, based on average norms relative to healthy controls and other individuals with aphasia.

e) **Five-Point Global Coherence Rating Scale** (Wright et al., 2013)

Separately rate each utterance from picture description, narrative, procedural, or expository discourse transcript using the following rating scale:

4 – There is obvious relevance of the utterance to the topic or theme. Enough information is provided about the topic or stimulus item that the listener is not required to make inferences.
3 – The utterance is related but there may be some tangential information or assumed knowledge that is relevant to the topic or theme. Alternatively, there may only be enough substantive information that the listener is required to make inferences. If the discourse task is a retelling, inessential but relevant elaborations are scored as a 3.
2 – The utterance does not obviously relate to the topic or theme and may include inappropriate tangential information or information about self in some remotely relevant way. Any relevance to the theme or topic may be non-critical.
1 – The utterance is completely unrelated to the topic or theme.

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Spoken Discourse Analysis Resources for Clinicians

f) **Auditory Perceptual Rating of Connected Speech in Aphasia** (Casilio et al., 2019)
Elicit a spoken discourse sample using a semi-structured interview format following the Free Speech Protocol from AphasiaBank (MacWhinney et al., 2011). Rate the client's productions across 27 speech and language features using the rating scale provided by Casilio et al. (2019).

- Manual Scoring Procedures and Training Materials: https://langneurosci.org/aprocsa/

g) **Communicative Success Scale** (Leaman & Edmonds, 2019, 2021a)

Conduct a conversation, using Leaman & Edmonds' guidelines (2021a). Transcribe the client's utterances and rate each utterance using the following scale:

4 – Successful: The message was communicated well despite any errors. The listener was able to understand the message. Errors may have been morphosyntactic in nature and were minimal or absent.
3 – Mostly successful: The listener understood most of the message with no more than minimal inference.
2 – Minimally successful: The listener required maximal inference to understand the "gist" of the message.
1 – Not successful: The message was not understood at all. The lack of success may have been related to paraphasia, jargon, irrelevant, or unintelligible words.

Additional Resources:

a) **Articles and Books**

Boyle, M. (2020). Choosing discourse outcome measures to assess clinical change. *Seminars in Speech and Language, 41*(01), 001–009.

Coelho, C., Cherney, L. R., & Shadden, B. B. (2022). *Discourse analysis in adults with and without communication disorders: A resource for clinicians and researchers*. Plural.

Kong, A. P. (2024). *Spoken discourse impairments in the neurogenic populations: A state-of-the art, contemporary approach.* Springer.

b) **Online**

Fostering the Quality of Spoken Discourse in Aphasia [Internet]. Available from: https://www.foqusaphasia.com/
AphasiaBank [Internet]. Available from: https://aphasia.talkbank.org/

Note. For a complete list of references for the cited studies, please see Supplemental Material S3.