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Tutorial

Let's Chat About Spoken Discourse: A Tutorial to Support Use of Spoken Discourse Analysis When Providing Aphasia Clinical Services

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ABSTRACT

Purpose: Spoken discourse is integral to everyday communication; improving discourse outcomes is a primary goal for individuals with aphasia and their families. Consequently, the application of discourse analysis in aphasia assessment and treatment has gained increasing attention in both research and clinical settings. Despite its recognized value among researchers and clinicians, several barriers—such as limited time, inadequate training, and lack of resources—continue to impede the widespread use of discourse analysis into clinical practice. To facilitate its broader adoption, speech-language pathologists require access to comprehensive resources that include information on discourse tasks, outcome measures, psychometric properties, and practical examples of how to implement spoken discourse assessments effectively. The purpose of this tutorial is to equip clinicians with this knowledge, promoting the consistent and effective application of discourse analysis in clinical settings.
Method: This tutorial, developed by members of the FOQUSAphasia Writing Group—comprising both researchers and clinical practitioners—offers an overview of recommended spoken discourse collection and analysis procedures, outcome measures, and their psychometric properties, as well as factors to consider when planning to conduct discourse assessments. It includes a series of case studies (severe aphasia, latent or very mild aphasia, bilingual aphasia, and primary progressive aphasia) that illustrate the utility of discourse analysis for varied clinical contexts and shows how the choice of tasks and measures can reveal meaningful insights tailored to the individual being assessed. In addition, the tutorial provides practical recommendations and considerations for incorporating discourse analysis into clinical aphasia services, along with suggestions for future research.
Conclusions: Spoken discourse production can be an important indicator of communication ability in individuals with aphasia. This tutorial is intended to support clinicians by providing evidence-based, practical ways for integrating discourse analysis into aphasia assessment and treatment. Our collation of information and case studies should encourage clinicians to apply spoken discourse-based approaches, ultimately improving outcomes for individuals with aphasia.
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Aphasia is a syndrome in which language abilities are affected, often in concert with related cognitive deficits, including issues involving attention, memory, and/or executive functioning (Murray & Clark, 2025). Whether resulting from static or progressive brain damage, the pattern of language and related cognitive symptoms can vary widely. However, what remains consistent and pervasive across persons living with aphasia (PWA) is reduced success and participation in daily communication activities such as telling stories and partaking in conversations (Dipper et al., 2021; Dutta, Murray, & Stark, 2024). Spoken discourse, defined as spoken output beyond single words or isolated short phrases/clauses, is integral to many, if not the majority, of these daily communication activities with which PWA may struggle across home, work, educational, and/or community environments (Armstrong, 2000; Halliday & Matthiessen, 2004; Linnik et al., 2016). Consequently, for many decades, researchers have sought to describe how spoken discourse may be affected in the presence of aphasia, documenting difficulties at both microlinguistic (i.e., word and sentence characteristics such as lexical-semantic retrieval accuracy and speed or syntactic completeness and complexity, respectively) and macrolinguistic (i.e., more global characteristics such as story grammar and coherence) levels, even in individuals with very mild severities of aphasia (e.g., DeDe & Salis, 2020; Dutta, Murray, & Stark, 2024; Holland, 1982).

Given the prevalence and consequences of spoken discourse breakdowns, an ever-growing empirical literature has pursued developing and validating spoken discourse analysis procedures and tools to support diagnosis and/or treatment planning for PWA (Dipper et al., 2021; Dutta, Murray, Stark, & Bryant, 2024; Fromm et al., 2017; Leaman & Edmonds, 2019, 2021a, 2021b; Stark, 2019; Stark et al., 2020). This research has documented the value of discourse analysis in identifying and characterizing aphasia beyond what traditional structured aphasia tests offer. For example, discourse analysis frameworks can efficiently characterize spoken language impairments in PWA across various linguistic levels in natural contexts. In contrast, structured aphasia tests primarily evaluate the decontextualized production of isolated words or sentences. Furthermore, unlike most single-word or sentence tasks, which require stimuli to elicit specific linguistic targets (e.g., on a naming task, pictures are selected to elicit some high- and low-frequency nouns), discourse tasks typically require less stimulus control (e.g., a procedural discourse task may require just the instruction "Describe the steps for changing a tire"); this eliminates the need to match linguistic stimuli cross-linguistically when evaluating the languages of bilingual PWA, which is a significant benefit. This broader naturalistic approach permits a comprehensive assessment of language use. In terms of treatment, discourse analysis is used to identify treatment goals or targets and monitor progress on discourse outcomes, regardless of whether spoken discourse is a treatment focus (Boyle et al., 2023; DeDe & Hoover, 2021; Falconer & Antonucci, 2012). Several reviews have summarized common spoken discourse analysis procedures and measures and assessed their quality (e.g., Bryant et al., 2016; Pritchard et al., 2017; Stark & Dalton, 2024). Nonetheless, implementing spoken discourse analysis into clinical practice may be challenging and overwhelming given the diversity of theoretical frameworks and tasks, analysis tools, and measures described in this literature. Indeed, when clinicians (and researchers) have been surveyed, they are keen to implement spoken discourse analysis with PWA but report barriers such as inadequate training in conducting discourse analysis and interpreting resulting data (e.g., Bryant et al., 2017; Cruice et al., 2020; Stark et al., 2021).

Accordingly, to facilitate the integration of discourse analysis into clinical practice, this tutorial aims to guide clinicians by (a) providing a brief overview of spoken discourse analysis procedures and (b) presenting a series of cases, illustrating discourse analysis implementation and highlighting the unique findings revealed in individuals representing a range of aphasia profiles. Specifically, we aim to provide clinicians with information related to discourse collection methods, outcome measures (including psychometric properties), and key factors to consider when providing aphasia clinical services. We conclude the tutorial by identifying future research directions that hold the potential to ensure that spoken discourse analysis procedures meet the needs of clinicians, regardless of their work settings, as well as the diverse population of individuals living with aphasia.

Brief Review of Spoken Discourse Analysis Procedures

Collecting the Spoken Discourse Sample

To evaluate discourse-level language outcomes in PWA, various structured and unstructured monologue- and dialogue-based elicitation tasks across a range of contexts (i.e., genres) can be used (Bryant et al., 2017; Murray & Clark, 2025). Discourse genres include (a) descriptives—presenting information about a referent such as a scene or picture; (b) narratives—generating a novel story or recounting a series of fictional or personal events or experiences; (c) procedures—explaining how something is done, typically in a step-by-step, chronological, or logical sequence; (d) expositions—providing information organized around a central topic, with facts presented in a structured manner that highlights their logical connections; and (e) conversation—

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engaging in structured or spontaneous interactions between speakers. Importantly, language performance differs depending on the genre and task (Bryant et al., 2016; Stark, 2019). See Table 1 for a summary of definitions and advantages/disadvantages of each spoken discourse genre. See Table 2 for a list of associated tasks and key considerations for each discourse genre, including use in multicultural/multilingual populations. For a more comprehensive overview of discourse genres, readers are recommended to consult Leaman and Archer (2023).

Factors to Consider When Selecting Discourse Tasks

Several factors should be considered when deciding which type(s) of spoken discourse data to collect. Discourse task selection should align with the PWA's specific discourse needs (Leaman & Archer, 2023). For instance, if a person living with aphasia wants to improve their skills in creating digital content and video blogging, narrative or expository tasks could be elicited in the initial discourse evaluation and for progress monitoring. Furthermore, unstructured and structured discourse tasks differ in their functional purpose, contextual elements, and cognitive–linguistic as well as social demands (Armstrong, 2000; Linnik et al., 2016; Stark & Fukuyama, 2021). For example, conversational discourse, which most people partake in daily, can provide insight into overall functional communicative abilities of a person living with aphasia. In contrast, structured tasks might be selected to measure specific language skills as they offer greater control and a standardized approach to repeatedly elicit similar samples from an individual over time or across different individuals to compare outcomes, facilitate replicability, and yield diagnostic results. Within monologic tasks, story retelling elicits richer language and imposes greater working memory and executive functioning load compared to static picture description tasks, as it requires actively holding information in memory and retelling the story in an accurate and coherent sequence (Cahana-Amitay & Jenkins, 2018; Dutta, Murray, & Stark, 2024). Likewise, storytelling and retelling, particularly personal recounts, are common everyday communication activities (Dipper & Pritchard, 2017; Lawrence & Paige, 2016; Olness & Ulatowska, 2011). Additionally, the presence or absence of pictorial stimuli can significantly alter task demands, particularly for more complex discourse tasks (Doyles et al., 1998; Olness et al., 2002). For instance, retelling Cinderella while viewing the storybook reduces cognitive load compared to retelling the story without the book and may yield picture descriptions rather than true narration. Indeed, Paek and Murray (2015) reported that their participant with chronic anomic aphasia and concomitant memory and executive functioning impairments was more productive (e.g., larger total number of words; more words/min) when telling the story depicted in the *Bear and the Fly* picture-only booklet when viewing the booklet versus when telling the story after viewing booklet; however, he was more efficient (i.e., percentage of correct information units [CIUs; see below for description of this discourse measure]) when telling the story without versus with the booklet.

Cognitive demands related to the environment can have different effects on discourse-level language structures. For example, evidence suggests that when PWA engage in dual-task conditions (i.e., conditions that emulate distractions while talking, such as concurrent tone discrimination), they experience interference with discourse production to an extent greater than that of their peers without aphasia. Specifically, they have been found to produce syntactically simpler and more unsuccessful utterances (Murray et al., 1998) as well as a slowed speech rate (Harmon et al., 2019) during dual-task conditions. Furthermore, the effects of cognitive demands may vary based on aphasia severity. For example, Harmon et al. (2023) found that dual-task conditions have the greatest negative impact on the macrolinguistic structure of participants with moderate aphasia, whereas microlinguistic processing was impacted in those with milder aphasia (word productivity and lexical diversity). Importantly, these effects seem to be specific to cognitive demands rather than social demands (e.g., story retelling with a communication partner who exhibited disinterested behaviors such as a lack of head nods, neutral facial expressions, and poor eye contact). Therefore, cognitive demands can impact discourse differently depending on the presence and severity of aphasia, highlighting the need to consider these factors in assessment and treatment to support PWA in everyday communication.

The selection of discourse genre and task (including stimuli) should consider the individual's racial, ethnic, and cultural background to ensure that the assessment is salient and meaningful while acknowledging the diverse linguistic and cultural experiences that shape each individual's communication style (Goral, 2024). As an example, to compare spoken discourse in African American people with and without aphasia, Ulatowska et al. (2001) used personal narratives, which engaged participants emotionally, enabled personalization of stories, and elicited natural language that effectively captured the African American English vernacular and other ethnic features of their language. Culturally relevant stimuli foster eliciting richer and more representative samples of spontaneous language (e.g., Mazumdar et al., 2023). For instance, the Cinderella story, widely used due to its inclusion in the AphasiaBank protocol, may not be suitable for non-English speakers or individuals from diverse cultural backgrounds who might not be familiar with story

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Table 1. A summary of discourse genres, including advantages/disadvantages of each genre.

Discourse genre	Definition	Advantages/disadvantages
Descriptive	Describing a single picture or a sequence of pictures (e.g., the Cat spoken picture description from the Comprehensive Aphasia Test [CAT; Swinburn et al., 2022], the Broken Window picture sequence from the AphasiaBank protocol [MacWhinney et al., 2011])	**Advantage**: elicit specific, expected content, allowing for standardized analysis of lexical items, informativeness, and main concepts **Disadvantage**: may restrict the content and form of verbal output, with limited ability to elaborate on the picture(s) (e.g., may elicit naming rather than discourse-level output); limited clinical utility in accurately and sensitively detecting subtle language impairments (Stark et al., 2025); less ecologically valid than conversation, cannot be used to evaluate interactive variables (e.g., turn-taking)
Narrative	Telling a novel story, retelling a well-known (overlearned) story, or recounting a personal event or experience (e.g., Dutta, Murray, & Stark, 2024; Linnik et al., 2022)	**Advantage**: permit assessment of micro- and macrolinguistic levels of production; encourage the use of more complex syntax (Bose et al., 2021; Schnur & Wang, 2024; Stark, 2019; Ulatowska et al., 1990), evaluative language (e.g., abstract mental and relational verbs; Armstrong, 2005), and organization (e.g., story grammar for fictional narratives, Stein & Glenn, 1979; “high point” for personal narratives, Labov, 1972). Novel and overlearned stories have expected content, allowing for standardized analysis of lexical items, informativeness, and main concepts. Storytelling or retelling may draw upon unique cognitive components (e.g., memory, executive functioning; Cannizzaro & Coelho, 2013; Stark & Fukuyama, 2021). Narratives are more effective than procedural discourse when assessing idea density (Stark, 2019). Accurate and sensitive task for assessing subtle language deficits (Stark et al., 2025) **Disadvantage**: vary in degree of naturalness/relevance to everyday communication, with novel stories and overlearned stories being less ecologically valid than recounting personal events; cannot be used to evaluate interactive variables (e.g., turn-taking)
Procedural	Giving instructions or describing a set of actions or procedures (e.g., how to change a tire or complete routine tasks such as washing dishes [e.g., Brookshire & Nicholas, 1995])	**Advantage**: permit assessment of micro- and macrolinguistic levels of production; expected content, allowing for standardized analysis of lexical items, informativeness, and main concepts; requires speakers to organize and produce sequential information, promoting the use of cohesive and coherent language. Procedural discourse may be better suited for assessing fluency (i.e., speech rate), as it tends to be faster-paced than narration (Kintz, 2024). **Disadvantage**: less ecologically valid than conversation, cannot be used to evaluate interactive variables (e.g., turn-taking)
Expository	Justifying opinions, identifying cause and effect, and using persuasion	**Advantage**: less structured; not confined by specific agents or chronological order; demands higher cognitive engagement (i.e., drawing upon logic, reasoning, and articulating relationships between concepts; Ulatowska & Olness, 2000); requires individuals to present and support their viewpoints, integrate diverse information, and construct well-organized arguments, thereby promoting advanced language use including syntactically complex utterances (Kintz, 2024), social language skills (e.g., diplomatically sharing opinions), and critical thinking skills (Berman & Nir-Sagiv, 2007). Expository discourse may be better suited for assessing fluency (i.e., speech rate), as it tends to be faster-paced than narration; considered more cognitively demanding than procedural or descriptive discourse (Kintz, 2024; Lê & Coelho, 2024). **Disadvantage**: less ecologically valid than conversation, cannot be used to evaluate interactive variables (e.g., turn-taking)

(*table continues*)

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Table 1. *(Continued).*

Discourse genre	Definition	Advantages/disadvantages
Conversational	Structured or unstructured conversations with communication partners (e.g., clinicians, familiar partners such as family members, unfamiliar partners such as employees at a coffee shop)	**Advantage**: promote dialogue-based collaborative communication, in which individuals exchange ideas and negotiate their wants and needs with others; can serve a similar function to structured tasks (e.g., picture sequence description); dyadic interaction offers higher ecological validity (Leaman & Edmonds, 2021a); can be used to evaluate transactional success, turn-taking, and other variables (e.g., topic initiation and shifting) that are specific to interactive tasks **Disadvantage**: unstructured conversation samples can vary both within and between individuals; less likely to elicit complex syntax

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

details despite awareness of the general concept and could limit their willingness to provide a discourse sample (Bose et al., 2021). Additionally, when conducting discourse testing, age appropriateness must be considered. This involves selecting prompts, topics, and task demands that are relevant to the individual's age and aligned with their interests and life experiences. Furthermore, Mazumdar and colleagues (Mazumdar et al., 2020, 2023) found that, in Bengali speakers with and without aphasia, discourse tasks that used culturally relevant, realistic colored images elicited greater productivity and complexity (e.g., longer mean length of utterance [MLU]) than traditional black-and-white line drawings from picture description tasks, such as those used in standard aphasia test batteries. It is also important to note that using existing pictures for discourse elicitation can evoke culturally specific responses. For example, Bose et al. (2021) and Dutta, Mello, et al. (2024) found that when describing the picnic scene from the Western Aphasia Battery–Revised (WAB-R), individuals with Alzheimer's disease from India described the image of a woman pouring tea, whereas in Western cultures, the same image is typically interpreted as a woman pouring wine. Accordingly, although pictorial stimuli provide more structured responses for discourse, it is crucial to consider how cultural differences may influence the output. In addition to task and stimuli selection, it is important to conduct discourse assessments in the languages commonly used by bilinguals with aphasia, as linguistic features and communication strategies can vary significantly across languages. For instance, PWA may exhibit more frequent code-switching in one language compared to another, which can indicate greater difficulties with lexical retrieval and varying levels of familiarity with each language (e.g., Neumann et al., 2017). Therefore, there is empirical support for carefully choosing dyadic discourse tasks that reflect ethnoculturally appropriate content when characterizing spoken discourse in PWA (Goral, 2024; Molrine & Pierce, 2002; Ulatowska et al., 2001).

Analyzing the Spoken Discourse Sample

Discourse analyses can yield useful performance-based outcome measures, and spoken discourse samples themselves might be used for clinician- or observer-reported outcome measures to identify daily communication strengths and weaknesses, including the use of strategies that might facilitate or impede communication success. Despite the range of levels (e.g., words vs. sentences) and measures available to characterize the discourse output of PWA (Armstrong, 2000), there is limited consensus regarding the most representative and meaningful discourse outcome measures (Bryant et al., 2016; Dietz & Boyle, 2018; Pritchard et al., 2017). Instead, measures should be selected based on (a) the extent to which they are psychometrically robust and sensitive for their intended purpose (e.g., to accurately describe discourse impairments, monitor change over time, monitor treatment progress) and (b) the specific communication domains/levels that may best characterize a specific client's language (e.g., based on aphasia type/severity). For example, microlinguistic processes can be assessed using measures related to productivity, lexical characteristics, morphosyntactic complexity, or semantic content. To specifically capture collaborative and interactive aspects of conversational discourse, measures evaluating topic initiation and maintenance; the frequency, duration, and nature of turn-taking; and referential cohesion can be used. Additionally, tools such as the Brief Assessment of Transactional Success (Kurland et al., 2023, 2024) and the Basic Outcome Measure Protocol for Aphasia (Kagan et al., 2021) can evaluate how PWA effectively engage in conversations and exchange information with their communication partners. See Tables 3, 4, and 5 for a summary of recommended microlinguistic, macrolinguistic, conversational, and functional/social communication discourse outcome measures and psychometric properties. Additional information on psychometric evidence of the recommended discourse outcomes measures can be found in Supplemental Material S1.

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Table 2. A non-exhaustive list of spoken discourse genres, corresponding tasks, general task instructions, and important considerations, including examples of tasks that have been adapted for different languages/cultures.

Discourse genre and examples of commonly used tasks with supporting literature	Common task instructions	Important considerations and examples of adaptations in other cultures and languages
DESCRIPTIVE		
Cookie Theft (original version from Boston Diagnostic Aphasia Exam; Goodglass et al., 2001)	Single picture: "Tell me everything you see going on in this picture." Picture sequence: "I'm going to show you these pictures. Take a little time to look at these pictures. They tell a story. Take a look at all of them, and then I'll ask you to tell me the story with a beginning, a middle, and an end. You can look at the pictures as you tell the story."	Administered via telepractice; part of NIH Stroke Scale; also sensitive to right-hemisphere brain damage. *Cultural/linguistic adaptations:* Kiswahili–English bilinguals (Sang, 2015); Greek–French bilinguals with PPA (Karpathiou et al., 2018); Spanish (Green et al., 2011)
Cookie Theft (modern version; updated and in color; Berube et al., 2019)		Updated for the NIH Stroke Scale; also sensitive to right-hemisphere brain damage (Berube et al., 2022) *Cultural/linguistic adaptations:* Italian (Rossi & Bastiaanse, 2008)
Cat Rescue (Nicholas & Brookshire, 1993; AphasiaBank, MacWhinney et al., 2011); Cat spoken picture description (Comprehensive Aphasia Test; Swinburn et al., 2022)		Administered via telepractice (Stark et al., 2023); part of NIH Stroke Scale; also sensitive to right-hemisphere brain damage *Cultural/linguistic adaptations:* German (Green et al., 2011); Korean (Sung et al., 2016); Mandarin–English bilinguals (Li & Kiran, 2024); Cantonese (Kong & Law, 2019)
Picnic Scene (Western Aphasia Battery–Revised; Kertesz, 2007)		Used with PPA (Wilson et al., 2010) *Cultural/linguistic adaptations:* Mandarin–English bilinguals (Li et al., 2021); French–Canadian bilinguals (Boucher et al., 2022); Hindi, Bengali, Urdu, Tamil, Kannada, and Malayalam (Bose et al., 2025)
Norman Rockwell Pictures (e.g., The Runaway, Looking Out to Sea)		Used with older adults with clinical depression or Alzheimer's dementia (Murray, 2010), adults with closed head injury (Coelho & Flewellyn, 2003); used with persons living with aphasia (Altmann et al., 2014; Murray et al., 2007)
Broken Window, Refused Umbrella, Argument, and Directions Picture Sequences (Dalton & Richardson, 2015, 2019; MacWhinney et al., 2011; Nicholas & Brookshire, 1993, 1995)		Administered via telepractice (Stark et al., 2023) *Cultural/linguistic adaptations:* Cantonese (Kong & Law, 2019)
NARRATIVE		
Multilingual Assessment Instrument for Narratives (https://main.leibniz-zas.de/; Gagarina et al., 2019)	"I am going to tell you a story and then you can tell it to me again. First let's look at the whole story. Are you ready?" Examiner tells the story by unfolding two picture plates at a time. Once all the plates are unfolded, then the participant is asked to tell the story.	*Cultural/linguistic adaptations:* Used with German-, Russian-, and Swedish-speaking healthy adults (Gagarina et al., 2019); Hindi, Bengali, Urdu, Tamil, Kannada, and Malayalam (Bose et al., 2025)
Cinderella/Red Riding Hood (AphasiaBank, MacWhinney et al., 2011; Murray et al., 2004; Park et al., 2023, 2024)	"I'd like you to tell me this story. You can look at the pictures as you tell the story."	Administered via telepractice (Stark et al., 2023); sensitive to milder forms of aphasia (e.g., DeDe & Salis, 2020; Salis et al., 2021) *Cultural/linguistic adaptations:* Brazilian (Silveira & Mansur, 2015); Swedish (Månsson & Ahlsén, 2001); Italian (Rossi & Bastiaanse, 2008)
The Boy Who Cried Wolf, Tortoise and Hare		*Cultural/linguistic adaptations:* Part of Cantonese Aphasia Bank (Kong & Law, 2019)

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Table 2. *(Continued).*

Discourse genre and examples of commonly used tasks with supporting literature	Common task instructions	Important considerations and examples of adaptations in other cultures and languages
Frog, Where Are You? (Bose et al., 2021)	"I'm going to ask you to tell a story. Take a look at the pictures in this book, and then I'll put the book away and ask you to tell me the story in your own words."	*Cultural/linguistic adaptations:* Bengali–English bilinguals with Alzheimer's disease (Bose et al., 2022; Dutta, Mello, Cheng, Dash, et al., 2024); Hindi, Bengali, Urdu, Tamil, Kannada, and Malayalam (Balasubramanian et al., in revision; Bose et al., 2025)
Bear and the Fly (Dutta & Mohapatra, 2024; Dutta, Murray, & Stark, 2024; Paek & Murray, 2015; Youse & Coelho, 2005)		Used with adults with traumatic brain injury (Coelho, 1998; Loughnane & Murray, 2018)
Good Dog, Carl; Picnic (Kim et al., 2019, 2021; Kintz et al., 2016)	"These are children's books without words so that a person can make up their own story. First, I will look through the book and get an idea of the story. Then, I will start at the beginning and tell you the story that goes with the pictures [clinician's demonstration]. Now, it is your turn. Look at this book, and when you are ready, tell me the story that goes with the pictures."	
Story retell procedure example stories: Rooster Story (Harmon et al., 2019; Hula et al., 2003; McNeil et al., 2007)	With pictures, "You are about to hear a short story. As you listen, pictures that go with the story will appear on the screen. Listen to the story and watch the pictures carefully. When the story is completed, the pictures will be shown on the screen and you will be asked to retell the story." For retell with pictures, "These are the six pictures that go with the story you just heard. Use them to retell the story in your own words" (p. 571). For retell without pictures, "Retell the story in your own words."	Administered via telepractice (Georgeadis et al., 2004); sensitive to aphasia and acquired brain damage (Yoo & McNeil, 2019) *Cultural/linguistic adaptations:* Brazilian Portuguese (Ortiz et al., 2024)
Important event (AphasiaBank; MacWhinney et al., 2011; Stark & Fukuyama, 2021)	"Thinking back, can you tell me a story about something important that happened to you in your life? It could be happy or sad or from any time—from when you were a kid or more recently."	
Stroke and recovery (AphasiaBank; Casilio et al., 2019; MacWhinney et al., 2011; Olness & Ulatowska, 2011)	"Do you remember when you had your stroke?" "Tell me about your recovery. What kinds of things have you done to try to get better since your stroke?"	May be an overlearned narrative for those in the chronic stages of recovery *Cultural/linguistic adaptations:* Dutch (Groenewold et al., 2013)
Quick Aphasia Battery (Wilson et al., 2018) has a list of 12 topics (Casilio et al., 2019; Ezzes et al., 2022)	Converse for at least 3 min (aim for 5 min) around one or more conversation topics (e.g., best trip you ever took, favorite holiday as a child).	Depending on the amount of examiner input, may also serve to elicit a conversation sample *Cultural/linguistic adaptations:* Turkish (Parlak & Köse, 2024)
PROCEDURAL		
How to make a peanut butter and jelly sandwich (AphasiaBank; MacWhinney et al., 2011; Murray et al., 2007; Park et al., 2023, 2024)	"Tell me how you would make a peanut butter and jelly sandwich."	Administered via telepractice (Stark et al., 2023) *Cultural/linguistic adaptations:* Cantonese (egg & ham; Kong & Law, 2019)
ANELT (respond to everyday life situation; Ruiter et al., 2023)		Transcription-less quantitative analysis; sensitive to milder forms of aphasia (Ruiter et al., 2011) *Cultural/linguistic adaptations:* Developed in Dutch
Can you describe steps involved in preparing a cup of tea or coffee? Can you describe steps involved in washing dishes or your bike/car? (Brookshire & Nicholas, 1995)		Hindi, Bengali, Urdu, Tamil, Kannada, and Malayalam (Bose et al., 2025)

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Table 2. *(Continued).*

Discourse genre and examples of commonly used tasks with supporting literature	Common task instructions	Important considerations and examples of adaptations in other cultures and languages
"Procedures learned through special instruction and perhaps never performed": changing a tire, bowling (Ulatowska et al., 1981)		
EXPOSITORY		
What is your favorite sport and why? What are your opinions on healthcare or social media? (Kim & Dutta, 2024; Whitworth et al., 2020)	"I am going to ask you a series of questions and would like you to carefully reflect on each question and share your spoken opinion of the topics."	Used in PPA (Whitworth et al., 2018)
CONVERSATIONAL		
Set topics (e.g., discussion of technical progress; Lille Communication Test; Rousseaux, Vérigneaux, & Kozlowski, 2010)	Conversations guided by a set list of topical questions such as "Tell me about your earlier life" and related follow-ups such as "Tell me about your education" and clarifying questions.	
Cognitive Flexibility in Aphasia Screening (Spitzer et al., 2020)	Conversations about four everyday topics using pictures on everyday topics (shopping, watching television, cooking soup, washing clothes): "Please tell me what do you see in the pictures? What is happening here?"	
Free conversation (Barnes & Nickels, 2018; Beckley et al., 2013; Best et al., 2011); Social Conversation Collection Protocol (Leaman & Edmonds, 2019, 2021a)	Record a conversation you have at home. Pick a time when you would normally have a conversation. Record four conversations that are about 10 min long each. The middle section of the conversation is most often analyzed.	Could be used with familiar versus unfamiliar conversational partners (e.g., spouse vs. clinician); can vary environmental demands (e.g., presence of noise) Supplemental Material S2 from Leaman and Edmonds (2021a) provides protocol instructions for clinicians, including techniques to "minimize clinical feel of the conversation and maximize the casual feel."
Directed interview portion of Lille Communication Test (Darrigrand et al., 2011; Rousseaux, Daveluy, & Kozlowski, 2010)		Used to examine spoken discourse subsequent to right-hemisphere brain damage, traumatic brain injury, and onset of dementia (e.g., Koslowski Moreau et al., 2015) *Cultural/linguistic adaptations:* Originally developed for French (Rousseaux, Daveluy, & Kozlowski, 2010)

Note. For a complete list of references for the cited studies, please see Supplemental Material S3. NIH = National Institutes of Health; PPA = primary progressive aphasia.

Observer ratings may also be employed to assess discourse-level communicative success in PWA during monologue-based tasks or dyadic conversational exchanges (for a comprehensive review of studies, refer to Ramage, Rowe, & Greenslade, 2024). In several studies, audio or video recordings of discourse samples have been assessed for overall informativeness, understandability, quality, and accuracy of output via ratings provided by both naive listeners (e.g., university students with and without knowledge of aphasia, community-dwelling healthy adults) and familiar listeners (e.g., family member; Cupit et al., 2010; Hickey & Rondeau, 2005; Holland, 1982; Kong et al., 2018; Leaman & Edmonds, 2019, 2021b; Webster & Morris, 2019). In addition to verbal output, discourse samples can be rated for successful and unsuccessful use of nonverbal communication strategies, such as gestures and augmentative and alternative communication devices, as well as writing, which PWA may use to support their communication (e.g., Dutta & Mohapatra, 2024; Hogrefe et al., 2012; Stark & Cofoid, 2022). Incorporating both familiar and unfamiliar raters can enhance the social validity of outcomes derived from discourse assessments and treatments, as it provides a better understanding of communication effectiveness in aphasia from different perspectives, which is common in more naturalistic contexts.

Tools to Support Discourse Analysis

To address previously reported issues related to limited time and availability of training for clinicians (Stark et al., 2021), transcription software and tools have been developed to help reduce the time and effort typically

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Table 3. Recommended microlinguistic discourse outcome measures at different cognitive–linguistic levels, including descriptions and evidence of psychometric quality.

Category	Discourse variables	Description	Psychometric quality
Productivity			
Sample length	Total number of words (Murray et al., 1998; Nicholas & Brookshire, 1993)	The total number of intelligible words produced in context. The words do not have to be accurate, relevant, or informative relative to the discourse sample stimulus.	Reliability: *, †, ‡, ○ Validity
	Total number of utterances (Murray et al., 1998; Saffran et al., 1989)	The total number of well-formedutterances that represented complete thoughts. Prosody and pausing may be used to distinguish utterance boundaries in the presence of syntactic form issues.	Reliability: †, ‡
Speech rate	Words per minute (Saffran et al., 1989)	The number of intelligible words produced in a minute can be calculated by dividing the total number of intelligible words by the duration of the sample in minutes. The duration should include both speech and pauses but exclude any time during which the clinician is speaking.	Reliability: *, ○ Validity
Utterance/sentence length	Mean length of utterance	The average number of words produced per utterance	Reliability: *, ○ Validity
Lexical			
Lexical productivity	Proportion of open or closed class words (Stark, 2019)	Proportion of open class words (all nouns; verbs excluding auxiliaries and modals; adjectives; and adverbs) or closed class words (all word classes that are not listed as "open" class) relative to the total number of words	Reliability: †
	Open–closed class words ratio	Ratio of open class words divided by closed class words	Reliability: *, ○
	Nouns or verbs per utterance (Stark, 2019)	Average number of nouns or verbs (including verbs, copulas, and auxiliaries followed by past or present participles) per utterance	Verbs: Reliability: *, ○ Validity
	Noun–verb ratio	Ratio of nouns to verbs (excluding auxiliaries and modals)	—
	Core lexicon (see Dalton et al., 2020, for checklists; see Kim & Wright, 2020a, for tutorial)	Number of predetermined lexical items required to produce semantically meaningful and coherent narratives	Reliability: †, ○ Validity
Lexical diversity and richness	Type–token ratio	Number of different words (types) divided by the number of words (tokens)	Reliability: *, †, ‡, ○
	Propositional density	Number of verbs, adjectives, adverbs, prepositions, and conjunctions divided by the total number of words	Reliability: * Validity
Morphosyntactic			
Morphological inflections	Verb inflection index	Total number of appropriately inflected verbs to the number of verbs that are possible to be inflected	Reliability: †
	Noun inflection index	Total number of appropriately inflected nouns to the number of nouns that are possible to be inflected	—
Syntactic complexity	Proportion of embeddings	Total number of embeddings relative to the total number of utterances in the discourse sample	Reliability: †
	Proportion of well-formed sentences	Total number of well-formed utterances relative to the total number of utterances in the discourse sample	Reliability: †

(*table continues*)

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Table 3. *(Continued).*

Category	Discourse variables	Description	Psychometric quality
Semantic			
Informativeness	CIUs (Leaman & Edmonds, 2019, 2021b; Nicholas & Brookshire, 1993)	The total number of words that were intelligible, accurate, relevant, and informative in relation to the discourse stimulus	Reliability: *, †, ‡, •
	Informativeness (%CIU; Leaman & Edmonds, 2019, 2021b; Nicholas & Brookshire, 1993)	Total number of CIUs divided by total words	Reliability: *, †, ‡, ○
	Number of utterances with new information	Coherent utterances that provide novel information to the discourse sample. Grammatical completeness is not considered (e.g., even single-word utterances may count if they include new information).	Reliability: †, •
Non-informative output	Nonword and non-CIU output (Brookshire & Nicholas, 1995; Murray, 2010)	Nonword output categories = part words or unintelligible output and nonword fillers (e.g., “uh”). Non-CIU output categories = inaccurate words, false starts, unnecessary exact repetitions, nonspecific/vague words (e.g., “thing,” “stuff”), filler words, the word “and,” and off-task or irrelevant words	Reliability: †
	Unsuccessful utterances or %unsuccessful utterances (Murray, 2010; Murray et al., 1998)	Utterance does not convey accurate and novel information pertaining to the discourse stimulus (e.g., incoherent utterance, repeated utterances, abandoned utterances) or does not adhere to discourse task instructions (e.g., when describing a procedure, asks questions of the clinician such as “Have I talked long enough?”). The % symbol is the total unsuccessful utterances divided by total utterances.	Reliability: †, ‡
Efficiency	Efficiency (CIUs/min)	Total number of CIUs produced in a minute	Reliability: *, ‡, ○

Note. For psychometric quality, the terms *Reliability* and *Validity* are listed when evidence exists to support these psychometric properties. For psychometric quality (following guidelines by Koo & Li, 2016), reliability types are designated with the following symbols: * indicates high test–retest reliability (> .8), † indicates high interrater reliability (point-to-point agreement > 80%, intraclass correlation coefficient > .80), ‡ indicates evidence of high intrarater reliability, ▴ indicates high alternate forms reliability, • indicates high internal consistency, and ○ indicates minimal detectable change at 90% confidence (Stark et al., 2023). For more details about psychometric quality, see Supplemental Material S1. Some variables are best assessed using specific genres. For more information, please refer to Table 1. For a complete list of references for the cited studies, please see Supplemental Material S3. CIUs = correct information units.

required for manual transcription. These include the voice dictation function in Microsoft Word, Otter.ai, VEED.IO (available for various languages), and built-in live transcription tools on videoconferencing platforms (e.g., Zoom, Microsoft Teams). While various artificial intelligence tools offer audio transcription services, they are still in the early stages of implementation, and caution is necessary when uploading an individual’s audio and video content to a database, as it may potentially violate confidentiality regulations. Other open-source options are also available such as OpenBrainAI (https://openbrainai.com/), as well as CHAT (Codes for the Human Analysis of Transcripts) transcription conventions and instructions for use through AphasiaBank (MacWhinney, 2000; MacWhinney et al., 2011). AphasiaBank is a password-protected shared database that contains videos, transcriptions, and data from a large sample of speakers with and without aphasia across multiple languages (e.g., English, French, Italian, Spanish, Mandarin) performing various discourse tasks. By leveraging the aforementioned automated, user-friendly tools, clinicians can streamline discourse transcription, reducing the time required and minimizing the need for extensive training. These tools in concert with online resources such as AphasiaBank, in turn, can improve efficiency, enhance accuracy, and support multilingual needs.

Several automated and innovative methods have also been developed to facilitate discourse analysis in clinical settings. That is, after data collection and transcription, there are advanced tools available for evaluating language performance that are more efficient than traditional manual assessment. Computerized Language ANalysis

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Table 4. Recommended macrolinguistic discourse outcome measures at different cognitive–linguistic levels, including descriptions and evidence of psychometric quality.

Category	Discourse variables	Description	Psychometric quality
Main concepts	Overall main concept score (main concept composite)	Calculated as (3 × AC) + (2 × AI) + (2 × IC) + (1 × II)	Reliability: †, ‡ Validity
	Accurate complete main concepts	Number of accurate and complete concepts essential to convey the gist of the story—all essential information is accurate and complete	Reliability: *
	Absent main concepts	Number of absent concepts—none of the essential information is given	Reliability: *
	Number of main concepts (see Dalton & Richardson, 2019; Kong & Wong, 2018; Kong & Yeh, 2015; Nicholas & Brookshire, 1993, 1995; Richardson & Dalton, 2016, for checklists and scoring details)	The total number of main ideas produced related to the stimulus	Reliability: †
		Percentage of main events	Reliability: †
Organization	Story grammar (specific to story generation/retells; cannot be used with other genres)	Number of clauses representing storyline, setting/background (Whitworth, 2010)	Reliability: †
		Number of information components: who, is doing, what, when, where, why	Reliability: †
		Number of complete episodes in a story (initiating event + action + direct consequence)	Reliability: †
		Applebee developmental level rating (1 for *heaps* to 6 for *narrative*; Bottenberg et al., 1985; Lemme et al., 1984)	
	MSSG (see Greenslade et al., 2020, for scoring details; also Richardson et al., 2021, for results in PWA)	MSSG adds a sequencing score, total number of story grammar elements, total number of episodic elements, and episodic complexity to other scores obtained from the main concept analysis for Cinderella retells.	Reliability: † Validity
Coherence	% local coherence errors (Andreetta & Marini, 2015)	The extent to which each utterance of the story is conceptually related to the preceding one. Local coherence errors included missing or ambiguous referents and topic switching.	Reliability: †
	% global coherence errors (Andreetta et al., 2012; Andreetta & Marini, 2015)	The ability to semantically relate remote utterances in the framework of a given discourse or written text. Consequently, errors of global coherence included the production of utterances that were tangential, conceptually incongruent with the story, propositional repetitions, or simply fillers.	Reliability: †
	Likert scale rating of global coherence (Leaman & Edmonds, 2021a; Wright & Capilouto, 2012)	Discourse divided into utterances, then rated for global coherence on a Likert scale.	Reliability: †, ‡
Sequencing	MSSG (see Greenslade et al., 2020, for scoring details; also Richardson et al., 2021, for results in PWA)	Logical sequencing of content for the Cinderella retell.	Reliability: † Validity
Cohesion	Index of Cohesiveness (Andreetta et al., 2012; Andreetta & Marini, 2015)	Misuse of cohesive ties, including errors in anaphoric pronouns, in number and gender agreement between pronouns and nouns, misuse of function words or semantically related content words.	Reliability: †
	Cohesive markers (Ellis et al., 2005)	Adequacy of cohesive ties in three categories (reference, conjunction, lexical—predominantly incomplete/ambiguous reference ties).	Reliability: †

(*table continues*)

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Table 4. *(Continued).*

Category	Discourse variables	Description	Psychometric quality
	Cohesive ties (Ellis et al., 2005)	The completeness of cohesive ties was assessed based on whether the referent could be easily identified in the discourse, with incomplete ties lacking clear referents and erroneous ties being ambiguous due to multiple identifiable referents, followed by calculation of the number and percentage of complete ties in each sample.	Reliability: † Validity

Note. For psychometric quality, the terms *Reliability* and *Validity* are listed when evidence exists to support these psychometric properties. For psychometric quality (following guidelines by Koo & Li, 2016), reliability types are designated with the following symbols: * indicates high test–retest reliability (> .8), † indicates high interrater reliability (point-to-point agreement > 80%, intraclass correlation coefficient > .80), ‡ indicates evidence of high intrarater reliability, ▲ indicates high alternate forms reliability, ● indicates high internal consistency, and ○ indicates minimal detectable change at 90% confidence (Stark et al., 2023). For more details about psychometric quality, see Supplemental Material S1. Some variables are best assessed using specific genres. For more information, please refer to Table 1. For a complete list of references for the cited studies, please see Supplemental Material S3. MSSG = Main Concept, Sequencing, and Story Grammar; PWA = persons living with aphasia.

(CLAN) is one such software curated by AphasiaBank that allows for automated analysis of coded transcripts and produces a wide range of microlinguistic variables including lexical (e.g., noun–verb ratio, moving-average type–token ratio [MATTR]), morphosyntactic (e.g., verbs per utterance), and productivity (e.g., speech rate, MLU) as well as macrolinguistic variables such as main concepts. CLAN also automatically computes outcomes from two well-known grammatical analysis systems: the Northwestern Narrative Language Analysis (NNLA; Thompson

Table 5. Recommended conversational and functional/social discourse outcome measures at different cognitive–linguistic levels, including descriptions and evidence of psychometric quality.

Conversational variables		
Discourse variables	**Description**	**Psychometric quality**
Brief Assessment of Transactional Success (Kurland et al., 2023, 2024)	Accuracy of conveying story gist to conversation partners. Includes main concept checklists from 16 audio and/or video samples with normative data and alternative productions for scoring.	Reliability: *, † Validity
The Pragmatic Protocol (Prutting & Kittchner, 1987)	Assesses 30 pragmatic aspects of language use on a 3-point scale (*appropriate*, *inappropriate*, *not observed*)	Reliability: † Validity
Topic initiation (Leaman & Edmonds, 2020)	Topic-closing, Discontinuity device, Cohesion, Noncoherent	Reliability: †
Functional/social variables		
Communicative success (Leaman & Edmonds, 2019, 2020, 2021a)	Four-point rating based on verbal and nonverbal behaviors and included observation of the partner's response to the person with aphasia's turn (a rating of "4" being successful whereas a rating of "1" of not successful)	Reliability: *, †, ▲ Validity
Conversational strategies	Measure of functional strategies including iconic gesturing, drawing, writing, and circumlocution (Azios et al., 2021)	Reliability: †
Basic Outcome Measure Protocol for Aphasia (Kagan et al., 2021)	Nine-point rating scale ranging from 0 to 4 (with 0.5 intervals) of communication interaction (social acceptability) and transaction (success in message sending)	Reliability: † (acceptable)

Note. For psychometric quality (following guidelines by Koo & Li, 2016), the terms *Reliability* and *Validity* are listed when evidence exists to support these psychometric properties. Furthermore, reliability types are designated with the following symbols: * indicates high test–retest reliability (> .8), † indicates high interrater reliability (point-to-point agreement > 80%, intraclass correlation coefficient > .80), ‡ indicates evidence of high intrarater reliability, ▲indicates high alternate forms reliability, ● indicates high internal consistency, and ○ indicates minimal detectable change at 90% confidence (Stark et al., 2023). For more details about psychometric quality, see Supplemental Material S1. Some variables are best assessed using specific genres. For more information, please refer to Table 1. For a complete list of references for the cited studies, please see Supplemental Material S3.

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et al., 1995) using the C-NNLA command and Quantitative Production Analysis (QPA; Rochon et al., 2000) using the C-QPA command. CLAN automates what would otherwise be a highly time-consuming process of manual coding and analyzing, making it much faster and more efficient. The detailed set of metrics generated by CLAN can then be used by clinicians to gain insights into various aspects of spoken discourse production. Detailed manuals for CHAT coding and CLAN analyses as well as translations in other languages are freely available at https://aphasia.talkbank.org/. Although there is a learning curve associated with using this platform, it can be a powerful tool for efficient discourse analysis in the long run.

There are also some time-efficient procedures for evaluating discourse samples. CIU analysis, which is commonly used to evaluate informational content and efficiency, involves identifying single words that are “accurate, relevant, and informative relative to the eliciting stimulus” but that do not have to be grammatically correct (Nicholas & Brookshire, 1993, p. 340); accordingly, CIUs provide information about semantics at the microlinguistic level (see Table 3). CIU measures have shown good to excellent test–retest reliability across discourse tasks and time points for samples of PWA (Nicholas & Brookshire, 1993; Stark et al., 2023). Additionally, a number of transcription-less analysis tools have been developed to assess discourse in aphasia (Stark & Dalton, 2024). For instance, main concept analysis (MCA) and core lexicon (CoreLex) checklists have been developed for a variety of standard discourse stimuli, significantly reducing the time required for macro- and microlinguistic analysis of samples, respectively (Dalton et al., 2024; Richardson & Dalton, 2016). MCA reliably quantifies discourse impairments associated with acquired brain injury and is available in English and multiple other languages (e.g., Dutch: Criel et al., 2021; Cantonese: Kong, 2011; Spanish: Rivera et al., 2018; Japanese: Yazu et al., 2022). Similarly, CoreLex comprises a defined set of lexical items frequently produced by healthy adult speakers when producing discourse in response to a stimulus (Kim et al., 2019, 2021; Kim & Wright, 2020b). Essentially, CoreLex serves as an indicator of typical word usage patterns and can capture lexical-semantic characteristics of connected speech. This tool reliably differentiates productions of PWA (Kim et al., 2023) and healthy adults (Kim & Kintz, 2024) over time. To further improve these tools' feasibility, researchers have developed web-based applications for clinical use (Cavanaugh et al., 2021a, 2021b, 2022), and CLAN includes an automated CoreLex analysis. Also, Auditory-Perceptual Rating of Connected Speech in Aphasia (APROCSA; Casilio et al., 2019) is a time-efficient perceptual rating scale that assesses 27 common speech and language features in discourse using a 5-point scale from *not present* (0) to *severe* (4); the 27 features reflect microlinguistic (e.g., semantic paraphasias, speech rate), macrolinguistic (e.g., meaning unclear, off topic), and functional (e.g., overall communication impairment/how well messages are conveyed) variables as well as motor speech variables (e.g., apraxia of speech, dysarthria). The APROCSA has demonstrated strong interrater reliability and validity and has a recently developed clinical training program (Casilio et al., 2023), with materials including a structured manual, webinar, freely shareable videos, and a scoring calculator.

To evaluate macrostructural elements of discourse, local coherence (i.e., how well consecutive utterances relate to each other) and global coherence (i.e., how well utterances relate to the overarching topic) can be assessed with 4- and 5-point rating scales (Coelho & Flewellyn, 2003; Wright et al., 2010). More recently, Linnik et al. (2022) introduced a more detailed coherence rating system that takes into account informativeness, clarity, understandability, and connectedness. Clinicians are encouraged to incorporate these types of rating tools into practice due to their user-friendly design and minimal training requirements, making them highly practical for fast-paced clinical settings and when the ratings of naive listeners are being sought. Refer to the Appendix and Supplemental Material S3 for a comprehensive list of resources and references on spoken discourse and analysis tools to be used in clinical settings. Readers may also consult Stark and Dalton (2024), a scoping review of transcription-less discourse analysis tools for analyzing microlinguistic and macrolinguistic aspects of discourse.

Cases Illustrating the Use of Spoken Discourse Analysis in Clinical Settings

Effective or functional communication in daily life is essential for maintaining social relationships, accurately relaying important information, and attaining goals in shifting contexts (Doedens & Meteyard, 2020). In aphasia, the goal of therapy is often to restore effective communication via restorative or compensatory skills that facilitate word retrieval, identify main concepts required to effectively communicate an idea, or enhance the use of multiple modalities to maximize successful interactions (Hersh et al., 2012; Murray & Clark, 2025). However, everyone with aphasia presents unique challenges that will influence the types of discourse tasks, level of analysis, and modes for input and responses depending on their unique context, necessitating tailored approaches for effective assessment and intervention.

Below are four cases demonstrating discourse use in the clinical process (see Table 6 for details). All were right-handed adults with acquired language impairments

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Table 6. Demographic and testing information for the four cases.

Case	Event	Aphasia type	Standardized tests	Discourse tasks	Level of discourse analysis
Tracy	CVA	Broca's	WAB-R, BNT, PPT, SAQOL, CLQT	Descriptive, conversation	Informativeness, efficiency
Mike	CVA	Latent	WAB-R, CLQT, QCL, CCRSA, DCT	Narratives	Informativeness, MATTR, core lexicon
Zulfekar	TBI	Broca's	WAB-H WAB-R	Narratives	Lexical, code-switching
James	PPA	Anomic to Wernicke	WAB-R, BNT, PPT, BRIEF-A RBANS, BDI	Descriptives, narratives, procedural	Overall productivity, lexical, core lexicon, mental state terms, vagueness

Note. For a complete list of references for the cited standardized tests, please see Supplemental Material S3. CVA = cerebrovascular accident; WAB-R = Western Aphasia Battery–Revised (Kertesz, 2007); BNT = Boston Naming Test (Kaplan et al., 2001); PPT = Pyramid and Palm Trees Test (Howard & Patterson, 1992); SAQOL = Stroke and Aphasia Quality of Life Scale–39 (Hilari et al., 2003); CLQT = Cognitive–Linguistic Quick Test (Helm-Estabrooks, 2001, 2017); QCL = Quality of Communication Life Scales (Paul-Brown et al., 2004); CCRSA = Communication Confidence Rating Scale for Aphasia (Babbitt et al., 2011); DCT = Discourse Comprehension Test (Brookshire & Nicholas, 1984); WAB-H = Western Aphasia Battery–Hindi (Karanth, 1980); BRIEF-A = Behavior Rating Inventory of Executive Function–Adult Version (Roth et al., 2005); RBANS = Repeatable Battery for the Assessment of Neuropsychological Status (Randolph, 1998); BDI = Beck Depression Inventory (Beck et al., 1996).

who underwent clinical assessments that utilized standardized tests along with discourse assessments. For each case, the rationale for selecting specific discourse tasks and analysis procedures, as well as the associated goals, is outlined. The choice of outcome measures was based on their ability to capture specific language impairments and their established psychometric properties. The first is a case of *severe aphasia* for which multimodal communication in discourse is assessed and targeted using multimodal communication treatment (MCT; Purdy & Van Dyke, 2011; Purdy & Wallace, 2016). The second demonstrates the use of discourse to identify subtle differences at the discourse level that are not evident on standardized testing in a case with *very mild or latent aphasia* (Cavanaugh & Haley, 2020), also sometimes referred to as latent aphasia (DeDe & Salis, 2020; Salis & DeDe, 2022; Silkes et al., 2021) or individuals who are not aphasic by WAB-R score (Dalton & Richardson, 2015; Fromm et al., 2017). The third case introduces the use of discourse to tease apart differences in language use across linguistic codes in a *bilingual* person with aphasia, necessitating tailored approaches for effective assessment and intervention. The final case highlights the combined use of standardized tests, discourse, and cognitive tests to understand underlying communication impairments in an individual with *primary progressive aphasia* (PPA) in whom the prognosis is assumed to shift over time, but the goal continues to be maintaining engagement in meaningful daily life (Rogalski & Khayum, 2018).

Case 1: Tracy (Contributed by Authors H.P. and E.B.)

Background Information

Tracy experienced a left-sided middle cerebral artery ischemic stroke, resulting in Broca's aphasia and right-sided hemiparesis at the age of 33 years. She is a speaker of African American English (proficient premorbidly) and was in a bachelor's level nursing program prior to her stroke. Tracy currently lives with her two children, and she is the primary caregiver of her family. Her mother lives next door and assists with daily activities as needed, such as helping Tracy's children with homework, managing appointments, and communicating with teachers. While Tracy is able to provide care for her children, she relies on her mother for communicating with her children about their daily activities and social/emotional well-being. Tracy expressed her needs for improved communication with her children. She had attended individual speech-language therapy sessions in a hospital outpatient setting; these sessions targeted the use of a speech-generating device. Because of her positive response to use of the speech-generating device, the clinician and Tracy sought more opportunities to expand her use of multimodal communication skills. Tracy was referred to the university research project targeting functional communication treatment at the age of 38 years (5 years after the stroke).

Assessment of Cognition, Language, and Communication-Related Quality of Life

Tracy's evaluation included various standardized tests in addition to discourse sample analysis. See Table 7 for the test scores and below for the description of her language skills. During the standardized testing, Tracy named common objects correctly (e.g., cup, knife) but missed tools (e.g., paper clip, hammer) and unfamiliar items (e.g., pyramid). She frequently produced phonemic paraphasias, and her repetition was limited to the one-word level. Spontaneous speech was characterized by effortful speech, incorrect responses to personal questions, and the use of single-word productions with severe word-

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Table 7. Standardized test scores (top panel) and pre- and posttreatment discourse results (bottom panel) for Tracy.

WAB-R AQ (pre to post)			**39.9 to 54.9/100**		
WAB-R aphasia classification			Broca's		
Naming skills					
Boston Naming Test–Short Form (pre to post)			6/15 to 9/15		
WAB-R object naming (pre to post)			34/60 to 44/60		
Pyramid and Palm Tree (picture)			27/52 (51.92%)		
CLQT+ Composite rating			Not available		
SAQOL-39					
Overall			3.64/5		
Communication subset			3.14/5		
		Picture description		**Conversation**	
		Pre-tx	***Post-tx***	***Pre-tx***	***Post-tx***
Verbal	Words per minute	11.8	17.27	13.2	15.4
	Percentage of correct information units	77%	90%	75%	89%
Verbal & nonverbal	Communicative success	[5] 1.7/4	3.5/4	2.4/4	3.4/4
	Percentage of successful communication breakdown resolution (%resolution)	[6] 32%	48%	43%	54%

Note. We also attempted to evaluate her cognitive skills with the CLQT+ (Helm-Estabrooks, 2017), but Tracy could not finish it because of her difficulty understanding task instructions. WAB-R = Western Aphasia Battery–Revised; AQ = Aphasia Quotient; Cognitive–Linguistic Quick Test–Plus = CLQT+; SAQOL = Stroke and Aphasia Quality of Life Scale–39.

finding difficulty in the picture description task. Tracy's comprehension skills were also limited. She could answer most yes/no questions correctly but showed difficulty with abstract concept questions (e.g., "Will paper burn in fire?"). She followed simple two-step commands but had difficulty with longer, more syntactically complex directions and identifying the left/right side of the body. On the Pyramids and Palm Trees (PPT) test, her semantic skills appeared limited as evidenced by her difficulty understanding the task and the relationships between pairs. On the Stroke and Aphasia Quality of Life Scale, Tracy expressed a moderate impact of aphasia on her ability to speak on the phone, get others to understand her, find the right words, and get others to understand even after repetition. Additionally, she indicated that she felt her language difficulties interfered with her family and social life.

Goals and Rationale for the Use of Discourse Analysis

To improve Tracy's communication with her family, we evaluated her (a) efficiency of verbal production and (b) functional communication skills using various communication modalities. Her discourse efficiency was evaluated by words per minute (WPM) and percentage of correct information units (%CIU) to ensure fluency and accuracy in the content in her verbal production. Her functional communication skills were measured by her ability to resolve verbal communication breakdowns using other communication modalities (e.g., writing, gesturing), captured with a communicative success rating (Leaman & Edmonds, 2019, 2020, 2021a), and percentage of successful communication breakdown resolution (%resolution). Improved functional communication skills would allow her to continue communicating with others when having word-finding difficulties.

The WAB-R picnic scene and a conversation were administered to obtain spoken discourse samples. Following the picnic scene description task, conversation was initiated with a topic related to the scene (e.g., "When was the last time you went to a beach?") and lasted for 5 min. During the two discourse tasks, Tracy was given a pen and paper and allowed to use any other device (e.g., a cell phone, communication book) to aid her spoken expression. In each task, the four measures described above were calculated as follows: (a) WPM, calculated as the total number of words produced divided by the total minutes; (b) %CIU and its calculation is described in the Appendix; (c) communicative success, calculated as the mean rating of how successful each utterance was in communicating the speaker's intent using any modality (1 = *not successful*, 4 = *successful*); and (d) %resolution, which measures the successful resolution of word-finding difficulties and is calculated by the number of successfully delivered alternative modalities divided by the number of word-finding difficulties (i.e., use of pauses, fillers, revisions, repetitions, circumlocutions, and paraphasias) during the task. Her language samples were manually transcribed and coded by a trained research assistant and then verified by another research assistant. Each utterance was segmented based on C-units (i.e., syntactic units consisting of an independent

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clause with all its modifiers or dependent clauses; Loban, 1976), and all transcripts were organized in an Excel spreadsheet for data calculation.

At the initial evaluation, Tracy produced isolated words (e.g., “dog,” “kite”) or short phrases (e.g., “boy run”), without appropriate morphological markers for plural, present progressive tense, and contractible copula. Thus, Tracy’s spontaneous speech was informative but agrammatic and lacking in efficiency related to difficulties in lexical retrieval and syntax. Her low WPM was mainly due to frequent pauses and effort to revise the produced words. Although she often showed word-finding difficulties, 40%–50% of the time, she resolved the difficulty by searching for words on her phone or by circumlocuting, but she did not utilize other modalities or methods. If those strategies failed, she often abandoned the word.

MCT in Discourse

Based on the above assessment results, intervention focused on increasing Tracy’s use of various communication modalities via MCT with a discourse task to improve her functional communication skills. Learning principles (i.e., errorless learning, fading of prompts, repetition, increasing context complexity) were incorporated into the practice portion of sessions. Tracy participated in three 1-hr sessions per week for 10 weeks, two individual sessions, and one group session with another person with aphasia. Sessions included training the multimodal communication strategy during word-level and discourse activities. For treatment, 20 person-centered common objects were selected with four objects trained for five different modalities (i.e., speaking, writing, drawing, gesturing, using a communication book) in each individual session across four sessions. Once training was completed at the word level, the target objects were presented in a photograph scene (e.g., a proposal scene for the target “ring”), and Tracy was asked to describe the scene including the target word using the various communication modalities. To increase ecological validity, Tracy also participated in group sessions where she interacted with another person with aphasia using various communication modalities while playing a game to communicate objects and creating joint narratives about picture scenes.

At posttreatment, Tracy produced longer phrases and short sentences (e.g., “They having a picnic,” “Boy flying kite”) and increased her WPM and %CIU, indicating improved communication efficacy (see Table 7). She attempted various modalities, with gesture being her most successful modality; consequently, her communication success rating and %breakdown resolution also improved (see Table 7).

Conclusions

Targeting increasingly complex expressive productions in five different modalities allowed Tracy to continue to contribute to conversations even when she encountered word-finding difficulties. Furthermore, her verbal fluency increased, and her verbal productions became more content relevant. Her nonverbal skills improved, especially her use of gestures and the communication book. These improvements collectively increased her communication success and breakdown resolution skills. Although standardized tests also documented Tracy’s improvement, the discourse data provided ecologically valid information regarding her daily communication skills and the impact of MCT. That is, the advantage of including discourse analysis is that it can yield information about functional communication in real-world situations (Doedens & Meteyard, 2022). Furthermore, treating at the discourse level and communicating in daily life activities is one of the principles for generalization (Mayer et al., 2024) and was impactful for Tracy.

Case 2: Mike (Contributed by Author H.K.)

Background Information

In 2020, Mike experienced a left-sided embolic cerebrovascular accident at the age of 58 years. He is a monolingual English speaker and holds a 4-year college degree in business. Following the stroke, he was hospitalized for approximately 60 days, during which he received physical therapy, occupational therapy, and speech-language therapy as part of his rehabilitation. His medical history prior to the stroke is unremarkable, with no significant conditions that could have contributed to his stroke or impacted his recovery process. He has no prior history of other neurological diseases or depression. He has two children. Prior to his stroke, Mike worked as a consultant at a consulting firm, a role that required frequent presentations and high-pressure conversations with clients. Following his stroke, he was advised to retire from his job. As he had not considered retirement before the stroke, he wanted to receive speech-language therapy with the goal of returning to his job or retaining his employment. However, he was unable to access speech-language pathology services due to insurance coverage issues, despite having a very mild impairment that still affected his ability to return to work.

Assessment of Cognition, Language, and Communication-Related Quality of Life

Mike’s assessment was conducted by a student research assistant in author H.K.’s research lab. Given his prior role as a consultant and his desire to return to a similar position, the ability to listen, comprehend conversations, and respond appropriately to clients was essential for his job performance. Therefore, we evaluated his discourse-level comprehension, cognitive abilities, and language production, as these skills were crucial for his role.

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The Discourse Comprehension Test was administered, revealing solid auditory comprehension, even for more extended and complex discourse. Mike scored 22 out of 24 on the yes/no questions asked after each of the three stories. On the WAB-R (see Table 8), Mike achieved a perfect score on the spontaneous speech and picnic scene description sections; however, he did use fillers such as "uh," "oh," and "um," suggesting word-finding challenges. Other sections of the WAB-R, particularly the word-finding section, along with his Cognitive–Linguistic Quick Test (CLQT) Generative Naming subtest score, also indicated struggles with word retrieval. Although Mike did not exhibit noticeable attention deficits, a lower CLQT Design Generation subtest score suggested potential difficulties with high-level cognitive functions related to mental flexibility.

Additionally, during the interview, Mike expressed concerns about a lack of confidence in his communication skills. To further assess his communication-related quality life, we administered the American Speech-Language-Hearing Association (ASHA) Quality of Communication Life (QCL) scale. He reported moderate satisfaction with several key aspects of communication poststroke (e.g., "It's easy for me to communicate," "I am confident that I can communicate"). Mike's overall QCL score reflected a balanced, though somewhat challenged, communicative life poststroke, indicating areas of both strength and potential improvement. On the Communication Confidence Rating Scale for Adults, a self-assessment tool designed to measure a client's confidence in various aspects of communication, Mike demonstrated a moderate level of overall communication confidence. His scores suggested areas where he felt less confident in social interactions poststroke, particularly being included in conversations and being understood by others. The results highlighted the need for focused interventions to improve the client's confidence in these key areas of communication.

Goals and Rationale for the Use of Discourse Analysis

Because these standardized tests focused on structured, isolated language abilities, Mike's scores failed to capture the word-finding difficulties he was experiencing, which suggested very mild aphasia and which likely contributed to his reduced confidence in social interactions. To better characterize the full extent of his communication challenges, discourse analysis was conducted to gain insight into his subtle spoken language deficits related to word retrieval and mental flexibility within more naturalistic, real-world, dynamic communication (Cavanaugh & Haley, 2020; Fromm et al., 2017). Thus, two narrative tasks, the "Picnic" (McCully, 1984) and "Good Dog, Carl" (Day, 1985) stories, were employed. We evaluated his (a) lexical productivity and diversity, (b) informativeness, and (c) coherence within discourse. His lexical productivity and diversity were measured respectively by core lexicon (Kim et al., 2019, 2021) and MATTR, which captures the number of different words used within a moving window, thus controlling for discourse length. These measures permitted evaluation of his word retrieval ability by word class. Informativeness was measured by %CIU. Finally, coherence was measured with a 4-point global coherence rating (Wright et al., 2013). Insights into subtle language deficits in these areas were felt to be crucial in determining their impact on Mike's effective communication in everyday life. Mike's language samples were manually transcribed in the CHAT format. Core lexicon and lexical diversity (MATTR) were automatically calculated using CLAN, whereas %CIU and coherence were manually scored.

Table 8. Mike's performance on the aphasia and cognitive–linguistic tests (top panel) and discourse tasks (bottom panel).

WAB-R subtests	**Scores**		
Spontaneous Speech	20/20		
Auditory Verbal Comprehension	9.95/10		
Repetition	8.4/10		
Naming and Word Finding	8.7/10		
AQ	94.1/100		
CLQT+ subtests	**Scores (max)**		
Symbol Trails	10/10		
Symbol Cancellation	12/12		
Generative Naming	5/9		
Design Generation	4/13		
Discourse tasks	**MATTR**	**%CIU**	**Coherence**
Good Dog, Carl	0.867	74.4	3.61
Picnic	0.901	65.8	3.42

Note. WAB-R = Western Aphasia Battery–Revised; AQ = Aphasia Quotient; CLQT+ = Cognitive–Linguistic Quick Test–Plus; MATTR = moving-average type–token ratio (Covington & McFall, 2010); %CIU = percentage of correct information units.

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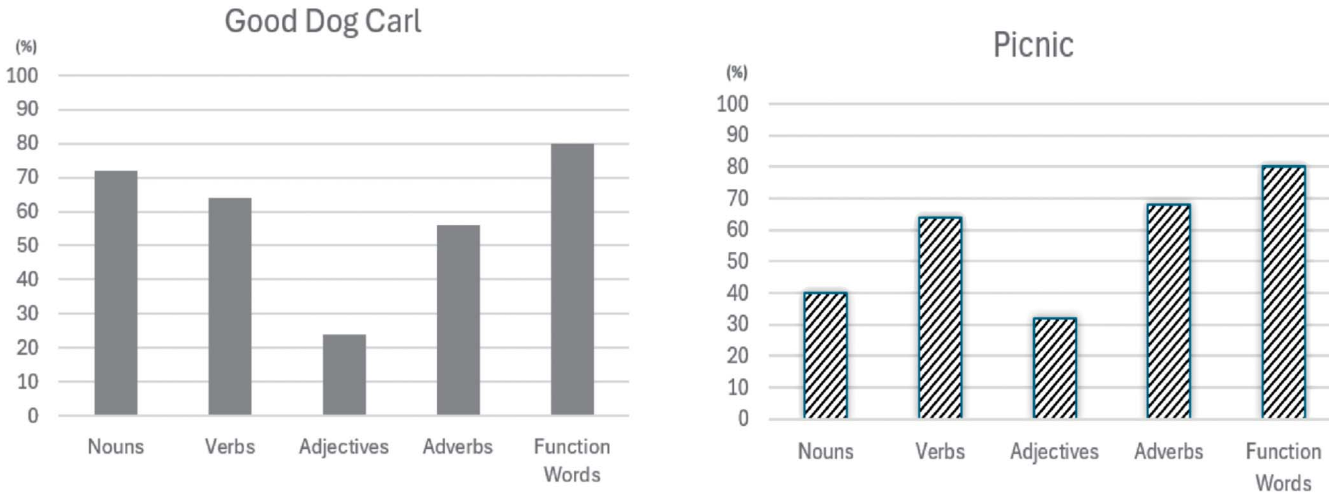
Figure 1. Mike's core lexicon performance for "Good Dog, Carl" (left panel) and "Picnic" (right panel).



Mike's performance varied slightly across different story tasks. Core verb and function word production were similar between the two stories, but fewer core nouns were produced in the "Picnic" story than in the "Good Dog, Carl" story. A higher MATTR score for the "Picnic" story suggested that Mike used more varied lexical items to describe this story, but these items were not considered "core" for accurately describing the "Picnic" story. This was further supported by a lower %CIU and coherence rating for the "Picnic" story. Although Mike included various lexical items, they were unrelated to the story, which made listeners rate his discourse as less coherent (see Figure 1 and Table 8).

Conclusions

As Mike's case illustrates, individuals classified as having very mild aphasia are often overlooked or misjudged when only standardized language tests are used. In contrast, more naturalistic discourse tasks can capture subtle spoken language deficits (e.g., cohesion issues), with different discourse tasks, even those within the same genre, placing varying demands on language and cognitive processing and thus often revealing different aspects of PWA's communication abilities. For example, the two stories used in Mike's assessment have distinctive characters in their story structures. The "Picnic" story includes a spatially and temporally driven story structure, whereas "Good Dog, Carl" has a temporally driven story structure. Indeed, Mike's discourse varied across the stories. Although ideally, including additional discourse genres (e.g., expository) might have yielded deeper insight into Mike's ability to convey complex ideas or arguments, this case underscores the value of using more than one discourse task, particularly when assessing individuals with a latent aphasia profile.

Case 3: Zulfekar (Contributed by Authors A.B. and A.B.)

Background Information

Zulfekar was a 32-year-old, right-handed, Hindi–English bilingual man, who held a degree in mechanical engineering. He sustained a traumatic brain injury in a road traffic accident at the age of 27 years. While details are limited, he sustained a severe brain injury with a comminuted fracture of the left calvarium involving the frontal and parietal bones and extending through the mastoid air cells. His Glasgow Coma Score was 3/15 during his acute recovery. Zulfekar quit his job as an engineer following the brain injury and over the next 3 years received speech-language therapy. In presentation of Zulfekar's discourse characteristics, we provide his bilingualism profile generated using the adapted version of the Muñoz et al. (1999) questionnaires (e.g., language acquisition history, proficiency, usage and dominance) along with our decisions to ensure he could communicate to his full potential (i.e., discourse task selection, testing in unilingual vs. bilingual modes) and analyses of his bilingual behaviors (e.g., nature and frequency of code-switching). In terms of language background, he lived in Delhi, a predominantly Hindi-speaking region in Northern India with his family; he grew up in Bihar, where Hindi was his primary language. His schooling was in both Hindi and English, and he was equally proficient in both languages premorbidly, which was reflected in his equal oral language proficiency ratings[1] (listening and speaking at 6.25/7 for both languages). His pretrauma literacy skills were higher in English (6.25/7) than in Hindi (5/7). His language usage frequency[2] was 4.6/5 in Hindi and 2.5/5

[1]A higher score implies greater proficiency.
[2]A higher score implies greater frequency of usage.

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in English. Postmorbidly, this pattern remained largely unchanged, with Hindi at 5/5 and English at 2/5. Pretrauma, he used English primarily in his professional life and Hindi with family and friends. Posttrauma, he primarily spoke in Hindi and struggled to communicate in English, limiting his use of English to text messages and social media.

Assessment of Cognition, Language, and Communication-Related Quality of Life

Zulfekar had moderate Broca's aphasia in both languages. All assessments were conducted by the author, A.B., as part of a research study (Balasubramanian et al., in revision), who is proficient in both Hindi and English. WAB Spontaneous Speech scores were higher in Hindi (12/20) than English (9/20). There was frequent code-switching with English nouns used in Hindi narratives (e.g., "tree ə͡tʃʰaː hai" [*tree is good*]). Code-switching is common in bilingual communities such as India (Gafaranga, 2005), acceptable (Grosjean, 1998), but with greater heterogeneity even within homogeneous Hindi–English speaker groups (Si & Ellison, 2023). Code-switching in bilingual PWA, once labeled as "pathological" (Abutalebi et al., 2000; Fabbro et al., 2000), is now recognized as an effective communication strategy (Goral et al., 2019). Therefore, the type and frequency of code-switching is relevant when working with bilinguals with aphasia.

Goals and Rationale for the Use of Discourse Analysis

To gain a more comprehensive view of Zulfekar's communication skills in a culturally appropriate manner, narrative samples were elicited in both unilingual and bilingual modes. Discourse analyses evaluated (a) his lexical productivity in English and Hindi and (b) the type and frequency of his code-switching. His lexical productivity was measured by the total number of words and the number and proportion of nouns and verbs (both bare and inflected) in each language. Also, the frequency of two types of code-switching was identified (see Table 9): (a) alternation, occurring when a person switches between languages at the level of clauses or sentences, and (b) insertion, occurring when a lexical item from one language is incorporated into the grammatical structure of the other language. To enhance our interpretation of Zulfekar's discourse sample, these variables from Zulfekar's sample were compared to data from a bilingual control (BC) participant matched for age, gender, and similar language background. The results of these discourse analyses were critical for planning treatment. The narratives of both participants were manually transcribed. Narrative words were then extracted using the QPA (Berndt et al., 2000), irrespective of language, while excluding repetitions, self-corrections, examiner prompts, discourse markers, and nonwords. Subsequently, count variables were manually calculated for each language based on the frequency of different lexical categories within the extracted narrative corpus.

To obtain a richer discourse sample than the WAB picture, we chose the Frog Story (Mayer, 1969), a culturally appropriate and effective narrative retelling task for bilingual populations, including those from India (Bose et al., 2021). To ensure Zulfekar was given maximum opportunity to produce a narrative, he was instructed that he could use either language without constraints. Zulfekar successfully produced a bilingual narrative lasting 11 min 30 s (for an excerpt, see Supplemental Material S2, Table S1); in contrast, he was unable to produce a narrative in either language in unilingual mode, barely generating any productive output.

In terms of lexical productivity, Zulfekar produced fewer narrative words compared to BC (Zulfekar = 458, BC = 730). He mainly produced nouns in English (e.g., "tree is leaf," "ship boat") but both nouns and verbs in Hindi (e.g., /tʃʰo ʈaː bət͡ʃə pəʈ̠əŋ t͡ʃəlaː rəɦaː ɦɛː/ "Small boy is flying kite"; see Figure 2). There was a marked asymmetry in grammatical class performance pointing toward a language-specific semantic impairment in retrieval of Hindi nouns. Furthermore, Zulfekar more frequently used code-switching compared to BC, with each of his utterances containing at least one code-switch. Zulfekar only inserted English words in Hindi sentences, whereas BC used both insertions and alternations. Additionally, Zulfekar was inflexible in his code-switching and consistently used Hindi sentence structure.

Table 9. Analysis of the type and frequency of code-switching (CS) for Zulfekar and the bilingual control (BC).

CS	Zulfekar	BC
CS per utterance ratio (no. of CS/no. of utterances)	1.2 (**128**[a]/107)	0.26 (61/236)
CS pattern predominant	Insertion	Insertion & alternation
Matrix language of insertions	Hindi	Hindi & English
Insertion: word class dominant	Noun	Noun

[a]In Zulfekar's story narration, there were significantly more instances of CS per utterance than in BC's narrative.

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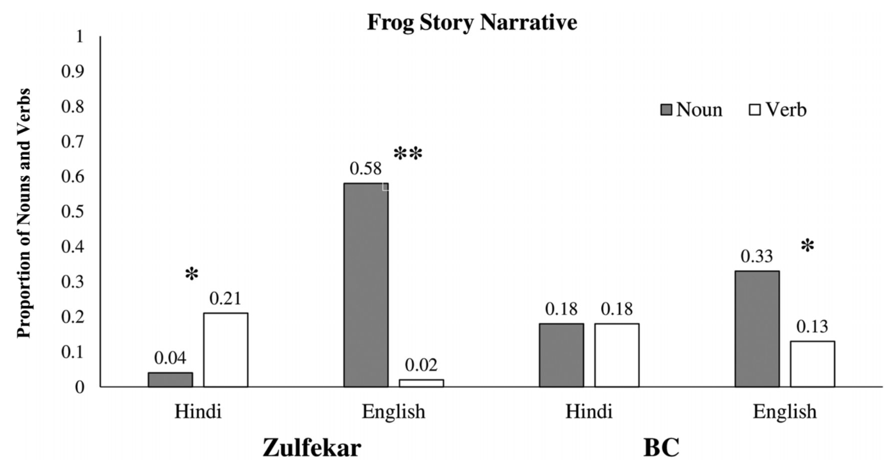
Figure 2. Proportion of the total number of nouns and verbs (out of the total number of narrative words) in Hindi and English in Frog Story narration for bilingual control (BC) and Zulfekar.



Conclusions

We provide three main take-home messages from this case:

- *Use of discourse tasks in cross-cultural settings:* Access to high-quality standardized tests for bilingual clients is difficult, and constructing a reliable and robust one requires substantial resources. Discourse tasks allow use with diverse populations as long as culturally appropriate materials are chosen. Using an appropriate discourse task across languages allows for averting the difficulties of matching linguistic stimuli on various linguistic properties. The discourse task in the bilingual mode offered a deeper understanding beyond traditional unilingual assessments. Zulfekar struggled with narrative production in the unilingual mode, and continued use of this approach might have led to incomplete or inaccurate observations of his abilities. In contrast, the bilingual task enabled a more nuanced analysis by examining lexical productivity and code-switching patterns within the context of his sociolinguistic background. Thus, clinicians assessing bilingual individuals with aphasia should consider whether standardized tests provide a complete picture of language abilities. If standard assessments prove insufficient, considering the individual's sociolinguistic context and using discourse tasks, particularly in the bilingual mode, might be useful.
- *Use of different elicitation modes for bilinguals as well as using code-switching as a communicative strategy:* Assessing a bilingual client in various modes (e.g., unilingual, bilingual) allows the clinician to gain insight into the individual's abilities. If a specific mode (in our case it was the bilingual mode) yields a richer sample or better communication, clinicians can use this information to identify facilitating communicative strategies for bilingual clients. If a client is able to use common bilingual behaviors (e.g., code-switching), then intervention should build on using them as a compensatory strategy to communicate (Muñoz et al., 1999).
- *Importance of language combination used by bilinguals*: If a client uses structurally similar languages, such as Spanish–Catalan, versus structurally distinct languages as in our case, Hindi–English, the expected profile of impairment across the two language pairs would be very different. Therefore, understanding the similarities and differences between languages can help us better understand how impairment manifests and, in turn, inform treatment planning.

Case 4: James (Contributed by Authors K.G., A.E.R., and C.C.)

Background Information

James was a 67-year-old, right-handed male who retired from his work with computers and had been very active in his community church ministry. He was a monolingual English speaker who had completed some college. Over the past 2 years, a history of mild neurocognitive disorder evolved, possibly indicative of semantic or logopenic variant PPA, though he had not received that diagnosis. Previous neuropsychological evaluations documented notable declines in language, learning, and memory over a year and a half prior to our evaluation. Neuroimaging indicated age-related atrophy along with supratentorial white matter hyperintensities likely secondary to small vessel ischemic changes. James reported difficulty finding words and decreased interest in

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reaching out to friends, resulting in diminished social engagement and increased isolation. James and his wife recently relocated from another state and lived next door to their adult son's family. He had been attempting to settle into his new home and enjoying time with his grandchildren.

Assessment of Cognition, Language, and Communication-Related Quality of Life

Standardized evaluations of language, cognition, and narrative discourse were collected at two time points over a 13-month period. James attended university-based treatment services in the intervening time, provided by graduate student clinicians with support from their academic instructor (A.E.R.) and clinical supervisor (C.C.), but that intervention is not the focus of this report. Rather, this case demonstrates the correspondence of change in standardized measures as they may be reflected in metrics of narrative performance. A consistent battery of assessments was administered at both visits (see Table 10).

At Visit 1, despite little word-finding difficulties in social greetings and informal interactions, on confrontation naming tests (WAB-R Object Naming, Boston Naming Test [BNT]), James exhibited long response delays (> 45 s), limited stimulability to phonemic cues, and unsuccessful self-cue attempts with circumlocution or use of carrier phrases (e.g., "scare somebody with a … " for *mask*). Repeatable Battery for the Assessment of Neuropsychological Status (RBANS) scores indicated difficulty with immediate and delayed memory for linguistic and visual

Table 10. Standardized testing was conducted at Visit 1 and again 13 months later at Visit 2.

Test		Visit 1	Visit 2
WAB-R			
Spontaneous Speech		14	16
	Content	5	8
	Fluency	9	8
Auditory Comprehension		8.6	5.85
	Yes/no questions	60	45
	Auditory word recognition	57	34
	Sequential commands	55	38
Repetition		7.2	6.2
Word Finding		4	1.4
	Object naming	20	7
	Word fluency	2	1
	Sentence completion	8	2
	Responsive speech	10	2
Aphasia Quotient		67.6	58.9
Boston Naming Test–Short Form[a]		4	1
Pyramids and Palm Trees raw score		40	25
Repeatable Battery for the Assessment of Neuropsychological Status index scores[b]			
	Immediate memory	40	40
	Visuospatial/constructional	84	50
	Language	DNT	40
	Attention	DNT	49
	Delayed memory	52	48
Behavior Rating Inventory of Executive Function–Adult T-scores			
Behavioral Regulation Index		47	45
Metacognitive Index		61	70
General Executive Composite		55	60

Note. Based on Hula et al. (2010), the WAB-R is reliable for moderately severe persons living with aphasia like James with a standard error of measure of ~2. Thus, the decrease in the Aphasia Quotient is clinically relevant with significant declines in Auditory Comprehension and Word Finding. For the RBANS, all index scores < 60 are considered extremely low. On the BRIEF-A, only self-report scores are provided, but informant-report (spouse) aligned well with James's reports indicating self-awareness of deficits. James's and his spouse's responses indicated no significant difficulty with emotional control, self-monitoring, or inhibition, but severe difficulty with planning/organization, task monitoring, working memory, and shifting. WABR-R = Western Aphasia Battery–Revised; DNT = did not test; RBANS = Repeatable Battery for the Assessment of Neuropsychological Status; BRIEF-A = Behavior Rating Inventory of Executive Function–Adult Version.

[a]The 60-item Boston Naming Test was administered at Visit 1, and the 15-item Short Form was administered at Visit 2. [b]No scaled score for RBANS Line Orientation, List Recall, or List Recognition, raw score reported.

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information. James and his spouse had similar responses on the Behavior Rating Inventory of Executive Function–Adult Version (BRIEF-A), reporting difficulty with metacognitive skills to a greater extent than behavioral control.

At Visit 2, James was again interactive, and his word retrieval in natural interaction appeared easy, despite significantly poorer performance on standardized word retrieval measures (i.e., all WAB-R word-finding subtests, BNT). Another striking difference at Visit 2 was the lack of circumlocution or self-cueing efforts and, in concert with a reduced PPT score, indicated a loss of conceptual knowledge. In terms of overall language abilities, James' Aphasia Quotient declined from 67.6 at Visit 1 to 58.9, and his aphasia classification changed from anomic to Wernicke, due in large part to a decrease in auditory comprehension scores. There was a significant drop in visual perception and immediate/delayed memory on the RBANS, which aligned with the self- and informant-reports on the BRIEF-A of more severe difficulty with planning and organization, task monitoring, and working memory and emerging difficulty with organization of materials and initiation.

Goals and Rationale for the Use of Discourse Analysis

While individual profiles vary, the semantic and logopenic variants of PPA demonstrate declining integrity of conceptual knowledge over time, resulting in a loss of independence (Hardy et al., 2024) and less frequent social exchanges due to difficulty conveying these concepts in discourse. Thus, assessment across discourse genres was employed (cf. Gallée et al., 2023, 2024) over time to facilitate understanding of how changes in impairment-based metrics may be reflected in more naturalistic contexts. To assess these declines, we evaluated (a) overall productivity; (b) lexical productivity, diversity, and richness (see Figure 3) as well as word finding in the context of connected verbal production; (c) mental state term use (Greenslade, Honan, et al., 2024); and (d) vagueness (Greenslade, Ramage, et al., 2024). Overall productivity was measured in terms of MLU. Lexical productivity was measured with the percentage of open and closed class words and core lexicon; lexical diversity was measured with type–token ratio (TTR). Mental state term use is a metric that provides insight into a speaker's ability to share their own or others' perspectives (Byom & Turkstra, 2017; Stronach &

Figure 3. Mean length of utterance (MLU), type–token ratio, open–closed words ratio, and core lexicon words for each narrative identify variance across narrative genres. *Exceeding the minimal detectable change (MDC; Stark & Cofoid, 2022). PB&J = peanut butter and jelly sandwich.

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Turkstra, 2008), with such social cognitive elements often being impaired in the discourse of individuals with PPA (Gola et al., 2015). Vagueness was defined as the use of unclear and/or inaccurate referents, nonspecific lexical selection, and omission of contextual information (with appropriate/inappropriate topic maintenance and change; Prutting & Kittchner, 1987). Analyses were intended to gather additional information beyond standardized test results, to identify communication challenges as well as appropriate treatment strategies to address those challenges, and to identify metrics for monitoring communication declines that might impact interactions with his wife and family.

Our standard discourse assessment protocol included the AphasiaBank (MacWhinney et al., 2011) standardized elicitations for narratives (see Supplemental Material S2, Table S2). James's life event monologue at Visit 1 was informative and relatively complete, and therefore, that event was queried again during Visit 2 to assess social cognitive elements, specifically mental state term use and vagueness, at both time points. In addition, discourse samples were transcribed in CHAT and evaluated using automated CLAN analyses (MacWhinney, 2000; MacWhinney et al., 2011) to facilitate objective measurement of overall productivity, lexical productivity, diversity, and richness (see Figure 3) as well as word finding. Mental state term use and vagueness variables were analyzed manually. Transcription procedures are reported in Ramage, Greenslade, et al. (2024). Differences for these measures across narratives were of interest given the potential for differing cognitive demands between genres and stimuli. For example, the Cat Rescue picture is considered more complex than others as it requires some inference about the interactions among its elements (Nicholas & Brookshire, 1993). The Refused Umbrella picture sequence also tends to elicit different perspective-taking from the speaker, assuming the perspective of the characters in the scene, which requires shifts in verb tense (Richardson & Dalton, 2016).

James's spoken narratives did not demonstrate the kind of decline evinced on standardized testing. MLU and TTR differed over time, exceeding the minimal detectable change (MDC; Stark et al., 2023). Furthermore, James produced more open than closed class words for the Refused Umbrella and Broken Window. This indicates that while James's utterance length was shorter at Visit 2, the diversity of the words he used increased, but this was reflected through a greater number of open class words. The MDC has not yet been established for core lexicon words, and therefore, the differences between visits may only be considered qualitatively (see Supplemental Material S2).

At Visit 1, James' Important Event narrative included 73 mental state terms out of 707 total words (10.3% mental state words). At Visit 2, there were 49 mental state terms out of 669 total words (7.3% mental state words). This decrease in mental state term use may reflect declining social cognitive abilities or a decrease in his use of abstract language, despite a lack of change in the total number of words or variety of words used. At Visit 1, 40 of 90 (56%) of utterances were *vague*; 0% of utterances were *tangential*. At Visit 2, 34 of 77 (44%) coded utterances were *vague*, and 34 of 77 (44%) were *tangential*, with some utterances being both vague and tangential. A total of 72% of utterances were *vague and/or tangential*.

Conclusions

This PPA case demonstrates large discrepancies between standardized language test scores and discourse performance: For James, word finding for confrontation naming was severely impaired, but word finding in social interaction was much better. Over a 13-month period, several cognitive–linguistic test scores declined, but microstructural measures of his narrative productions only declined consistently for two of the five narrative tasks (i.e., Refused Umbrella, Cat Rescue). Interestingly, the picture stimuli for these two tasks have been considered unique for their tendency to have the speaker take another's perspective or be more complex given the need for inferencing and conceptualization (Hameister & Nickels, 2018; Richardson & Dalton, 2016). Similarly, despite there being no measurable changes in microstructural measures (e.g., MLU, core lexicon) for the Important Event personal narrative, there was a substantial increase in James's use of off-topic language, which was also evident on the Cat Rescue at Visit 2 (see Supplemental Material S2, Table S2 *italics*). In fact, it was the combination of tangential and vague language that made his Important Event narrative at Visit 2 particularly challenging to follow. Thus, in this case, standardized language tests identified severe impairments that were not as evident in the microstructural assessment of the discourse samples, but the addition of social cognitive metrics was more sensitive to the influences of declining language and cognition on functional communication. Importantly, while transcription revealed declining use of mental state terms and permitted line-by-line analysis of tangential and vague language, meticulous transcription in CHAT and analysis in CLAN were not essential in this case. Thus, when clinicians can identify key measures of interest prior to conducting analyses, they may be able to save time through more rapid automated transcription methods.

The information gleaned from the assessments led to clinical decisions to address conceptual knowledge through a modified semantic feature analysis approach (Boyle, 2004; Tilton-Bolowsky et al., 2023) and implementing alternative modes (use of a communication/memory book)

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to facilitate memory recall and narrative construction. A secondary goal was to improve the quality of conversations between James and his care partner. James's wife completed the Zarit Burden Interview (Zarit et al., 1980), which uncovered her feelings of social isolation, uncertainty, stress about the future, and a negative impact on her mental and physical health. Thus, treatment included counseling and education for James and his wife about PPA, providing educational resources and the benefits of expanding support systems to include local support groups and additional care assistance. In addition, James and his wife reported a decline in his communication initiation, resulting in diminished social engagement and increased isolation. Therapy sessions shifted to include conversational coaching (Hopper et al., 2002) to facilitate identification and application of verbal and nonverbal strategies to facilitate successful information exchange. The strategies were tailored to the patient's current communicative abilities, focusing on initiating, maintaining, and concluding conversations effectively—areas that discourse analyses identified as challenges, namely, the use of vague and tangential language.

General Recommendations and Considerations

Despite its clinical significance, many limitations and factors affect spoken discourse analysis. First, unlike standardized language tests, which come with manuals that describe their psychometric properties, some discourse language analysis measures have been used without psychometric evidence of their validity and reliability (i.e., how well the raters accurately and consistently measure data, respectively; Messick, 1989). Low validity and/or reliability may result in failure to identify a problem and consistently capture changes in discourse over time or in response to treatment, especially if the measure itself is unstable (Nunnally & Bernstein, 1994; Stark et al., 2020). Therefore, using measures with strong psychometric evidence supporting their use for their intended purpose is important. Tables 3, 4, and 5 describe various spoken discourse variables with information pertaining to their psychometric quality to help clinicians when making decisions regarding which measures to include in the analysis of their given client's discourse. Whereas review of Tables 3, 4, and 5 suggests that the psychometric properties of a growing number of discourse measures have been examined, it should be noted that, thus far, the focus has been on interrater reliability, with few measures having evidence of other forms of reliability or of validity. Relatedly, among the studies reporting the psychometric properties of these discourse measures, most have involved English speakers. Accordingly, more psychometric research is needed involving speakers of different languages, dialects, and cultures to assist clinicians when making decisions regarding discourse analysis measures and tools for these populations.

Second, although this tutorial provides a summary of recommended discourse tasks and measurements, it is important to keep in mind that not every recommended task or measure may be suitable for every individual, regardless of their aphasia profile. Instead and as demonstrated through the previous cases, the decision of which discourse tasks and measures to use should be purposely selected for each client, depending on their abilities, needs, and communication goals. For example, syntactic complexity measures are unlikely to yield valuable information when evaluating clients with severe aphasia whose output is limited to isolated words or short phrases. As another example, for clients in need of reducing circumlocutions and increasing the efficiency of their verbal output, core lexicon, %CIU, or both might be useful to monitor changes over time.

Third, whereas this tutorial has focused on spoken discourse in the context of aphasia, it is important to consider that nonverbal communication abilities such as drawing or gesturing may also contribute to the discourse success or difficulties of PWA (e.g., see Case 1). There are some standalone assessment tools such as the Pragmatic Protocol (Prutting & Kittchner, 1987) and Communicative Success (Leaman & Edmonds, 2019, 2020, 2021a) that involve rating use of both verbal and nonverbal modalities within monologic and conversational contexts. Furthermore, discourse samples can be quantitatively analyzed for multimodal strategy use by coding the frequency and types of strategies employed (e.g., number of times drawing and gesturing were used; Azios et al., 2021; Dutta & Mohapatra, 2024). Therefore, clinicians should consider both multimodal communication and spoken discourse measures when aiming for a comprehensive evaluation of discourse performance among PWA.

Related to the previous consideration, it is important to recognize that written discourse plays a significant role in many daily communication activities (e.g., texting, e-mail). Similar to spoken discourse, writing impairments can negatively affect an individual's personal, social, and vocational participation (Dietz et al., 2011; Kim et al., 2024). Although some of the sampling and analysis procedures developed for spoken discourse can be applied to written discourse, further research is needed to establish their reliability and validity when used to evaluate written discourse. Additionally, it would be beneficial to explore more contemporary genres of written communication such as texting, which may have unique qualities (e.g., mixing written text with emojis), to gain a more comprehensive

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understanding of how PWA use various forms of discourse in their day-to-day lives.

Last, it is important to acknowledge the various biases that can arise related to using spoken discourse assessments in aphasia, particularly for speech-language pathologists working with a diverse clinical caseload. In the survey study by Stark et al. (2020), many clinicians and researchers perceived that spoken discourse was not sufficiently aligned with functional communication goals or outcome measurement needs and therefore did not implement discourse analysis in their work. To address this misconception, it is essential to emphasize the importance of discourse-level communication during graduate speech-language pathology education and ongoing professional development. To further support speech-language pathology students and clinicians in building confidence with discourse assessments, researchers should consider making their study protocols—such as documentation on data collection and analysis procedures—available. This transparency would help current and future clinicians familiarize themselves with evidence-based discourse assessment tools. As previously mentioned in this tutorial, several training materials are hosted by developers (e.g., see https://aphasia.talkbank.org/discourse/), which clinicians and speech-language pathology educators are encouraged to explore and utilize. Biases may also influence our selection of discourse assessment tools themselves. For instance, it is common practice to use single-picture description tasks as part of traditional aphasia assessments, often seen as a standard approach to "discourse analysis" regardless of the severity of aphasia. However, relying solely on these narrow tasks can lead to overlooked impairment patterns (e.g., fail to capture more complex morphosyntactic deficits or fail to identify milder forms of aphasia, such as latent aphasia; Stark et al., 2025). Moreover, as noted above, discourse output varies with the stimuli used, and therefore, use of more than one discourse task/genre, particularly those that align with the PWA's daily discourse activities, is recommended (Stark, 2019). As clinical caseloads become increasingly diverse, it is essential to select culturally sensitive discourse stimuli and tasks for assessment. Many existing discourse assessment materials and tools have been designed for or validated with monolingual English speakers, and cultural differences in discourse have been studied to a limited extent, highlighting the need for further investigations to ensure more inclusive and representative discourse assessment methods (Marcotte et al., 2024). Additionally, while discourse analysis is a cost-effective tool for assessing communication skills across cultures, clinicians must be aware of cultural and gender differences that may influence performance. For instance, Sharma et al. (2019) found that women scored significantly higher than men on connected speech fluency and information content on the WAB-R. Similarly, discourse tasks should be carefully modified based on the individual's linguistic and cultural background. For instance, asking individuals to describe topics that are not common in their cultures (e.g., describing the process of making a peanut butter and jelly sandwich) may lead to insufficient responses, not due to aphasia but because of unfamiliarity with this procedural discourse stimulus.

Summary and Conclusions

This tutorial offers clinicians a comprehensive guide to collecting and analyzing the spoken discourse data of PWA, including an overview of the psychometric properties of common discourse measures and key considerations for their use. We also present four distinct case studies representing a range of aphasia profiles, demonstrating how discourse analysis can provide insights into real-world communication abilities that go beyond what standardized language assessments can capture. Clinicians are encouraged to use this tutorial as a resource to enhance their understanding of discourse assessment and to apply the evidence-based practices outlined here to inform their clinical decision making.

Data Availability Statement

The articles cited in this tutorial are available digitally through ASHAWire (https://pubs.asha.org) for ASHA journals, through university library portals for non–ASHA-affiliated journals, and via the Google Scholar search tool. Information reported in the article, supplemental materials, and case-specific data can be accessed upon request by contacting the corresponding author at mdutta@pdx.edu.

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Appendix (p. 1 of 3)

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)

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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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Appendix (p. 3 of 3)

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.

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Supplemental Material S1. Reliability and validity evidence supporting the use of spoken discourse variables at different cognitive-linguistic levels.

MICROSTRUCTURAL VARIABLES			
Category	**Discourse Variables**	**Reliability**	**Validity**
Productivity			
Sample length	Total number of words (Murray et al., 1998; Nicholas & Brookshire, 1993)	Test-retest reliability* (ICC = .82-.83, Stark et al., 2023) Intra- and inter-rater reliability (ICC = 1, Stark et al., 2023) Minimal detectable change at 90% confidence (Stark et al., 2023)	Construct validity: ● Expected group differences (*p* = .0002 with controls > PWA, Stark et al., 2023)
	Total number of utterances (Murray et al., 1998; Saffran et al., 1989)	Intra- and inter-rater reliability (Murray, 1998; Stark et al., 2023; in Broca's aphasia: ICC = .96; Rochon et al., 2000)	
Speech rate	Words per minute (Saffran et al., 1989)	Test-retest reliability* (ICC = .97 for PWA, .79 for controls; Stark et al., 2023) Minimal detectable change at 90% confidence (Stark et al., 2023)	Construct validity: ● Expected group differences (*p* < .0001 with controls > PWA, Stark et al., 2023)
Utterance/ sentence length	Mean Length of Utterance	Test-retest reliability* (ICC = .94 for PWA, .66 for controls; Stark et al., 2023) Minimal detectable change at 90% confidence (Stark et al., 2023)	Construct validity: ● Expected group differences (*p* < .0001 with controls > PWA, Stark et al., 2023)

Lexical			
Lexical productivity	Proportion of open or closed class words (Stark, 2019)	Inter-rater reliability in Broca's aphasia (ICC = .98; Rochon et al., 2000)	
	Open-closed class words ratio	Test-retest reliability* (ICC = .70 for PWA, .41 for controls; Stark et al., 2023) Minimal detectable change at 90% confidence (Stark et al., 2023)	Construct validity: (evidence against use): ● Lack of expected group differences (*p* = .08, Stark et al., 2023)
	Nouns or verbs per utterance (Stark, 2019)	Test-retest reliability for verbs per utterance* (ICC = .91 for PWA, .56 for controls, Stark et al., 2023) Minimal detectable change at 90% confidence (Stark et al., 2023)	Construct validity: ● Expected group differences (*p* = .0003 with controls > PWA, Stark et al., 2023)
	Core lexicon (see Dalton et al., 2020 for checklists; see Kim & Wright, 2020b for tutorial)	Intra- and inter-rater reliability (Kim & Wright 2020)	Construct validity (Dalton & Richardson, 2015; Kim et al., 2022) ● Concurrent validity (Kim & Wright, 2020) ● Responsiveness (Kim et al., 2023)
Lexical diversity and richness	Type-token ratio (TTR)	Test-retest reliability* (ICC = .91 for PWA, .76 for controls, Stark et al., 2023) Intra- and inter-rater reliability (Stark et al., 2023) Minimal detectable change at 90% confidence (Stark et al., 2023)	Construct validity (evidence against use): ● Lack of expected group differences (*p* = .249 for controls vs. PWA, Stark et al., 2023)

	Propositional density	Test-retest reliability* (ICC = .94 for PWA, .22 for controls, Stark et al., 2023)	Construct validity: ● Expected group differences (*p* = .004 with controls > PWA, Stark et al., 2023)
Morphosyntactic			
	Verb inflection index	Inter-rater reliability (96%; Milman et al., 2008)	
Syntactic complexity	Proportion of embeddings	Inter-rater reliability in Broca's aphasia (ICC = .89; Rochon et al., 2000)	
	Proportion of well-formed sentences	Interrater reliability in Broca's aphasia (ICC = .96; Rochon et al., 2000)	
Semantic			
Informativeness	Correct information units (CIU; Leaman & Edmonds, 2019b, 2021a; Nicholas & Brookshire, 1993)	Test-retest reliability (*r* = .96; Leaman & Edmonds, 2019b; Nicholas & Brookshire, 1993) Inter-rater reliability (ICC > .90, Leaman & Edmonds, 2019b; > 90% Nicholas & Brookshire, 1993) Intra-rater reliability (97%, Murray et al., 2007; 92%, Murray et al., 1998) Internal consistency (Cronbach's alpha > 0.90, Altman et al., 2014)	
	Informativeness (%CIU; Leaman & Edmonds, 2019b, 2021a; Nicholas & Brookshire, 1993)	Test-retest reliability - mixed (good: Nicholas & Brookshire, 1993; Stark et al., 2023; below the threshold [> .75]: Boyle 2014; Capilouto & Wright 2006)	Construct validity: ● Expected group differences (*p* < .0001 for controls > PWA, Stark et al., 2023) ● Expected improvement following discourse

		Intra- and inter-rater reliability - best with longer samples (Stark et al., 2023) Intra-rater reliability [> 90%] (Brookshire & Nicholas, 1994; Cameron et al., 2010; Jacobs, 2001; Leaman & Edmonds, 2024) Minimal detectable change at 90% confidence (Stark et al., 2023)	treatment (3 of 4 participants showed large effect sizes when comparing CS at pre/post intervention; Leaman & Edmonds, 2024)
	Number of utterances with new information	Inter-rater reliability Internal consistency (Cronbach's alpha > 0.90; Altman et al., 2014)	
Non-Informative Output	Non-word and non-CIU output (Brookshire & Nicholas, 1995; Murray, 2010)	Inter-rater reliability (≥ 85% for each non-word and non-CIU category; Brookshire & Nicholas, 1995)	
	Unsuccessful utterances or %unsuccessful utterances (Murray et al., 1998; Murray, 2010)	Intra- and inter-rater reliability (97% and 96%; Murray et al., 1998)	
Efficiency	Efficiency (CIU/min)	Test-retest reliability (Boyle, 2014; Capilouto & Wright, 2006; Nicholas & Brookshire, 1994, 1995; Stark et al., 2023) Intra-rater reliability (95-96%; Ballard & Thompson, 1999; Murray et al, 2004) Minimal detectable change at 90% confidence (Stark et al., 2023)	Construct validity: ● Expected group differences ($p < .0001$ with controls > PWA, Stark et al., 2023)

MACROSTRUCTURAL VARIABLES

Category	Discourse Variables	Reliability	Psychometric Quality
Main concepts (Nicholas & Brookshire, 1993, 1995; Kong & Wong, 2018; Kong & Yeh, 2015; Richardson & Dalton, 2016, 2019)	Overall main concept score	Inter-rater reliability for main concept coding (90-100%, Richardson & Dalton, 2016; 96.8%, Richardson et al., 2021) Intra-rater reliability for main concept coding (91-100%, Richardson & Dalton, 2016)	Construct validity: ● Expected group differences (*p* < .001 with controls > PWA with medium to large effect sizes across subtypes, Richardson et al., 2021; similar in Dalton & Richardson, 2015) ● Age-related differences (significant differences with 20-59 years > 60^{+}, Richardson & Dalton, 2016) ● Concurrent validity with CoreLex ($r_s = .783$, $p < .001$ for PWA; $r_s = .630$, $p < .001$ for controls, Dalton & Richardson, 2015)
	Accurate complete (AC) main concepts	Test-retest reliability (Boyle, 2014; Capilouto & Wright, 2006; Nicholas & Brookshire, 1994, 1995)	
	Absent main concepts	High test-retest reliability (Boyle, 2014; Capilouto & Wright, 2006; Nicholas & Brookshire, 1994, 1995)	
	Number of main concepts	Inter-rater reliability (kappa > .80, Andreetta et al., 2012; Greenslade et al., 2020; macrolinguistic rubric: ICC = .95, Dutta et al., 2024)	

		Intra-rater reliability (macrolinguistic rubric ICC =. 97, Dutta et al., 2024)	
Main events	% main events	Inter-rater reliability (85%, Capilouto et al., 2006)	
Organization	Story grammar: # clauses in setting/storyline (Whitworth, 2010)	Inter-rater reliability (80-96%, Altman et al., 2012)	
	Story grammar: #information components: who, is doing, what, when, where, why	Inter-rater reliability (> 80%, Capilouto & Wright, 2009)	
	Story grammar: # complete episodes in a story (initiating event + action + direct consequence)	Inter-rater reliability (96%, Coelho et al., 1994)	
	Main Concept, Sequencing, and Story Grammar (MSSG; Greenslade et al, 2020; Richardson et al., 2021) – Total episodic components and episodic complexity scores	Inter-rater reliability (kappa = 0.99-1.00, Greenslade et al., 2020; >80%, Richardson et al., 2021)	Construct validity: ● Expected group differences (*p* < .006 with controls > each aphasia subtype, small to large effects depending on subtype, Dalton & Richardson, 2015) ● Age-related differences (significant differences with 20-59 years > 60^{+}; Greenslade et al., 2020)
	Coherence (Leaman & Edmonds, 2021a, 2021b; Linnik et al., 2022; Wright & Capilouto, 2012)	Inter-rater reliability (90%; Ulatowska et al., 2003)	

	% local coherence errors	Inter-rater reliability (*K* = 0.783, Andreetta & Marini, 2015)	
	% global coherence errors	Inter-rater reliability (*K* > .80, Andreetta et al., 2012; *K* = .783; Andreetta & Marini, 2015)	
	Global coherence (Leaman & Edmonds, 2020; Wright & Capilouto; 2012)	Inter-rater reliability (94%, Coelho & Flewellyn, 2003; in conversations: 83%, Leaman & Edmonds, 2020) Intra-rater reliability (100%, Coelho & Flewellyn, 2003)	
Sequencing	Main Concept, Sequencing, and Story Grammar (MSSG; Greenslade et al, 2020; Richardson et al., 2021)	Inter-rater reliability (*K* = .99, Greenslade et al., 2020; 98-99%, Richardson et al., 2021)	Construct validity: ● Expected group differences ($p < .001$ with controls > each aphasia subtype, medium to large effects, Dalton & Richardson, 2015) ● Age-related differences (significant differences with 20-59 years > 60^+; Greenslade et al., 2020)
Cohesion	Index of cohesiveness (Andreetta et al., 2012; Andreetta & Marini, 2015)	Inter-rater reliability (ICC = 0.88; Zhang et al., 2021)	

CONVERSATIONAL VARIABLES

Discourse Variables	**Reliability**	**Validity**
Brief Assessment of Transactional Success (Kurland et al., 2023, 2024)	Test-retest on repeated stimuli: acceptable Interrater reliability (transcripts + main concept scoring): acceptable	Construct validity: ● Age-related differences on MC composite (young vs. middle-aged: $p = .007$,

		young vs. older: p = .002, Kurland et al., 2023)
The Pragmatic Protocol (Prutting & Kirchner, 1986)	Inter-rater reliability (controls: 100%; disorders: 91-100%; Prutting & Kirchner, 1986)	Construct validity: ● Expected group differences (similar scores and ranges for cases with left vs. right hemisphere damage, but different profiles of identified weaknesses)
Topic initiation (Leamon & Edmonds, 2020)	Interrater reliability (coding of non-verbal communication accompanying TI utterances: 96%; Leaman & Edmonds, 2020)	
FUNCTIONAL/SOCIAL VARIABLES		
Discourse Variables	**Reliability**	**Validity**
Communicative success (CS; Leaman & Edmonds, 2019, 2020, 2021)	Test-retest reliability (ρ = .798 in PWA, Leaman & Edmonds, 2021) Interrater reliability (92%, Leaman & Edmonds, 2019; 83%, Leaman & Edmonds, 2020; ρ = .895 in PWA, 99% in controls, Leaman & Edmonds, 2021; > 90%, Leaman & Edmonds, 2024)) Alternate forms reliability (i.e., stability across conversational conditions: r = .959, Leaman & Edmonds, 2019; across genres:	Construct validity: ● Expected improvement following discourse treatment (3 of 4 participants showed large effect sizes when comparing CS at pre/post intervention; Leaman & Edmonds, 2024)
Conversational strategies	Inter-rater reliability (acceptable; alpha = .81 to .98, Azios et al., 2021)	

Basic Outcome Measure Protocol for Aphasia (BOMPA; Kagan et al., 2021)	Inter-rater reliability (among SLPs: ICC = .65-.96, comparing SLPs to experts [within 0.5pts]: 87-97%: Kagan et al., 2021)

Note: ICC = intraclass correlation, PWA = people with aphasia. Test-retest reliability is reported if considered high (r > .80), unless otherwise indicated. Inter-rater reliability is reported if considered high (i.e., point-to-point/percent agreement or ICC > .80), unless otherwise indicated.

* Per Stark et al. (2023), test-retest reliability for total number of words, words per minute, mean length of utterance, open-closed class words ratio, verbs per utterance, type-token ratio, propositional density, informativeness (%CIU), and efficiency (CIUs/minute) varies based on the specific task (i.e., Cat Rescue, Cinderella, Sandwich, Broken Window, Refused Umbrella) and group (PWA, controls). For a complete list of references for the cited studies, please see Supplemental Material S3.

Supplemental Material S2. Discourse sample excerpts from Cases 3 (Zulfekar) and 4 (James).

Table 1. Excerpt from Zulfekar’s Frog Story narrative.

First five utterances of the story narration
1. home में था | /hoʊm meɪn t̪ʰɑ/ ‘He was at home’
2. boy और dog बैठा था | /bɔɪ ɔːr dɒg baɪˈʈʰa t̪ʰɑ/ ‘Boy and dog was sitting’
3. और monkey नहीं | /ɔːr ˈmʌŋki nəhiːŋ/ ‘and not monkey’
4. frog बंद बैठा | /frɒg bənd̪ baɪˈʈʰɑ/ ‘frog closed sitting’
5. frog बैठा था | /frɒg baɪˈʈʰa t̪ʰɑ/ ‘frog was sitting’

Table 2. Sample excerpts from James’s Refused Umbrella and Cat Rescue narratives at Visits 1 and 2. **Bold:** core lexicon words; *Italics* = utterances that were not part of the Core Lexicon transcript and considered tangential.

Visit 1	Visit 2
Refused Umbrella	
*PAR: okay . *PAR: this is a sister or the **mama** not sure which telling a **boy** you gotta carry this &-um so you don't get **wet** . *PAR: &-um i don't have the word . *PAR: and looks like the same thing again +"/. *PAR: +" **take** this with you . *PAR: like he's **going to** school or something like that . *PAR: and I guess he either pretends that he's **taking** it **with** him . *PAR: or he decided not to because in the third one **he's** not holding anything to keep **him** from **getting wet** . *PAR: so oh what's wrong ? *PAR: <you go down here now **he's** got well> [//] oh i know maybe [/] maybe it's <number four> [/] number four he's getting **wet** . *PAR: so he goes back to **mama** or sister . *PAR: and he's a mess +"/. *PAR: +" and **she** probably says something like I told you to **take** this with **you** . *PAR: so now **he takes** it with him this time *PAR: so **that's** what I think is **going** on .	*PAR: Oh **it** is **raining** . *PAR: **I didn't** know that was **going to** happen. *PAR: **My mother** is upset . *PAR: **That** must be **a little boy** . *PAR: Let's see . *PAR: Oh, I think this is what you care [: carry] [* p:w] with you when it's **raining** . *PAR: That's what I think **it** looks like . *PAR: **So** oh we've **got** numbers too . *PAR: **So do** this . *PAR: **and not** too happy . *PAR: but I **am** smiling now . *PAR: I **don't** know **the** difference . *PAR: &-um **and he's walking** outside . *PAR: and here **it** comes again . *PAR: He **got** very **wet** +"/. *PAR: +" and **mama said you** should **have** come **in** faster .
Cat Rescue	
*PAR: okay . *PAR: **there's** a **little** creature . *PAR: what are you ?	*PAR: Yeah . *PAR: Somebody **climbed up** here &-um . *PAR: <I never> [/] I never would **go up** here .

*PAR: <you are a> [//] (00:11.33) it's **not** a

dog it's **a** +...

*PAR: if I don't **have** a **dog** I have a (00:06.74) kitty **cat** .

*PAR: that's what we used **to** say .

*PAR: is that **the** right word ?

*PAR: a cat .

*PAR: **so there's** a **cat** .

*PAR: **and** there's a person either **to get** the cat +"/.

*PAR: +" or maybe

this **little girl** sends the cat **up to** that person

and says I'll help you .

*PAR: that nice **little girl** has a bicycle .

*PAR: <&-um maybe **the** guy that's **up there**>

[//] maybe he dropped **the** thingy +//.

*PAR: when I say thingy **to** my wife I

say it too many times .

*PAR: +, this &-um something allows us to walk **up** from

the bottom of something to where **he** is .

*PAR: looks like there's a dog **there** too .

*PAR: and they wanna help .

*PAR: **so** somebody saw that somebody was **in** trouble .

*PAR: and they worked .

*PAR: but I don't know who **went** and got them .

*PAR: maybe they made a telephone **call** and asked the gentleman **to come**

and help this man that's kinda **stuck up there** and doesn't want to

hurt **himself** .

*PAR: I was afraid of falling **down** <even if> [/] even if I was tall .

*PAR: &-Um **so he climbs up** .

*PAR: **and** this is **the dog** .

*PAR: What kind of **dog** is **he** ?

*PAR: There's different ones .

*PAR: &-um looks like **he's** hungry .

*PAR: Oh, <he got or> [//] me **got stuck** here . [+ gram]

*PAR: **So the** good people had **to get** here right away **to come up** here **and**

get him down .

*PAR: **and** looks like they're **going to** school or **a** truck .

*PAR: I guess because it's **a** truck +"/.

*PAR: +" **And** that's **his** sister saying we'll help you .

*PAR: +" or &-um what are you doing ?

*PAR: +" we're gonna tell mommy **and daddy** +".

**PAR: <I really was> [//] I was older .*

**PAR: It was hard for me to do anything .*

**PAR: And in my life two or three times I did have problems here .*

**PAR: and then I had to stay home and everyday work on this .*

**PAR: and I couldn't walk to school &-um .*

**PAR: But that got taken care of so .*

*PAR: &-um and **there's** a **little** bird **up** there &-uh making noise hoping that somebody will come and help him . *PAR: i don't know . *PAR: &-uh that's **the** best I can do **so** . *PAR: that would be a great one for **the** kids	

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