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Discourse: Assessment and Therapy

Lucy T. Dipper and Madeleine Pritchard

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Abstract

Discourse is essential for interaction and for the expression of ideas, feelings and opinions. Telling personal stories, such as talking about your day or recounting what happened in the playground, is essential for communication and establishing relationships. However, due to their language impairments, people with aphasia (PWA) and children with developmental language disorder (DLD) often have problems with everyday discourse which impact on their lives more widely. While improvement in language skills is supported by speech-language pathology (therapy), it tends to focus on smaller linguistic components, such as single words and sentences. This chapter outlines how speakers construct discourse in everyday situations and focuses on the meanings that people use discourse to convey, as well as the lexical and grammatical resources they use to convey these meanings. Current methods for discourse analysis will be outlined and key developments in narrative discourse production therapy will be reviewed.

Keywords: discourse, narrative, connected speech, aphasia, language impairment, DLD, SLI

1. Introduction

Broadly speaking, discourse refers to the use of spoken or written language in a social context. However, in linguistics, the term 'discourse' is used to mean a unit of language longer than a single sentence [1]. In this chapter, we focus on this more narrow definition and use the term discourse to mean language beyond a single simple clause, used for a specific purpose or function. Using this definition, discourse is the basis for the vast majority of everyday communication. Everyday examples of discourse include: giving instructions about how to carry out a procedure, such as using a piece of computer software; recounting an experience, such as your day at work or school; or sharing an opinion, such as your views on social media use.

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Discourse, then, is fundamental to everyday communication and so when language impairment affects it, there is a knock-on effect to the person's life. Children need narrative to make sense of their experiences and take control of their lives, through reporting and describing things that have happened and to scaffold their literacy development. Adults need narrative to make and sustain friendships through the sharing of anecdotes, to express their opinions, and to enable others to see their perspective.

Narrative and discourse are increasingly the focus of clinical practice and research with both paediatric and adult client groups. The foundational work underpinning this clinical practice has been completed independently for child and adult groups. However, the advances made for each population have great potential to inform the other, and so in this chapter, we aim to synthesise the theory and findings from both fields. There is rationale for treating discourse in both health care and educational contexts. Discourse and narrative are given strong emphasis within early years and school curricula. For example, in the UK, the Early Years Foundation stage Statutory Framework [2] gives multiple examples of discourse and narrative production being prime early learning goals for children from birth to 5 years old. In the International Classification of Functioning, Disability and Health, from the World Health Organisation, difficulties with discourse reflect *body function* categories of impairment, including 'speaking' [3, 4] which impact on activities and social participation, such as 'telling a story' [3]. For example, a child with discourse impairment is likely to face challenges with accessing early years and school curricula, and an adult with discourse impairment is likely to have difficulty interacting with family, friends and colleagues. A broad range of everyday activities and social situations would be impossible without the skills to communicate information beyond single words and sentences. This chapter aims to provide the background for the assessment and intervention approaches for use by speech language pathologists (therapists) to improve discourse.

2. Discourse in people with language difficulties

Throughout this chapter, we will examine discourse through the lens of a number of seminal works because, although there have been recent advances in discourse measurement and treatment, the theoretical foundation is consistent. We will focus on the discourse of speakers with aphasia, a language impairment commonly arising following stroke, and developmental language disorder (DLD). DLD is the term agreed through expert consensus to describe children with language difficulties that create obstacles to communication or learning in everyday life, who are unlikely to catch up spontaneously and do not have language disorder arising from any other aetiology [5]. The evidence base we review is derived from English speakers. We examine discourse as a tool to convey meaning, focusing on three central components: (1) how language is used in discourse (lexical and grammatical resources), (2) what information is included in discourse and (3) how the information is structured. The relationship between these three components is not straightforward. To explore this complexity, we will refer to a model of discourse processing developed by Frederiksen et al. [6] and adapted as a framework for discourse production by Sherratt [7]. This model incorporates detail from a number of widely used and validated models of discourse and language production.

In Sherratt's discourse production framework, discourse starts as an idea which must be packaged for spoken language though a series of stages, which may take place repeatedly and/or simultaneously. First, the speaker identifies a meaning that they wish to communicate, for example, that they want to explain a specific procedure to someone. Next, the overarching discourse structure is identified (in this example, it would be a procedural discourse—see next section for more information on discourse types). The discourse structure guides both the information included and the structuring of that information. To include the key information, a speaker accesses semantic and episodic memory and then synthesizes and integrates information into the appropriate discourse structure. For example, in a procedural narrative instructing a friend about how to use a mobile phone to make a phone call, this could involve describing which buttons to press and the order in which to press them. Next, information is sequenced and edited based on the speaker's knowledge of context including the listener's background and world knowledge. For example, if the friend had never used a mobile phone before, you would give more information and include more steps in the procedure than you might when talking to someone more experienced. Next, the speaker assigns logical relationships to the ideas in the discourse, including foregrounding and backgrounding information, temporal sequencing, and causation and consequence. In the example, this may include a decision to first explain how to switch on the phone and find the appropriate buttons, before beginning the steps needed to make a phone call. Finally, the discourse is linguistically encoded and articulated.

Although there is evidence from child language development of a close link between overall language skills and discourse ability [8], the relationship is far from straightforward. The evidence base indicates that typically developing children aged 3–4 years old produce longer and more complex narratives if they are syntactically advanced, compared with children who are syntactically delayed. However, while some children with DLD and adults with aphasia have a relatively severe linguistic impairment, they are able to sometimes produce discourses containing a large amount of well-structured information. For example, a child or adult with a difficulty remembering or producing a particular word may be able to work around their impairment by using a close synonym, for example, replacing the word 'pony' with the word 'horse'. Such a substitution is unlikely to affect the overall organisation of the discourse. However, the reverse is also true, as some speakers with relatively mild language impairments produce discourse containing only limited information.

2.1. Discourse contexts, types, frames and genres

Discourse used for specific purposes often necessitates specific kinds of language, information and information structures. For example, a child describing their favourite meal and the story of *Rapunzel* would communicate different information in each discourse, use a different discourse structure and use different words. In the discourse literature, discourse 'purposes' have been described variously as 'contexts', 'types', 'frames' and 'genres' [1]. Throughout this chapter, we will use the term discourse *type*. Fields of study differ in their categorisations: for example, in education, discourse types (particularly written discourse, or text types) are commonly classified into narrative, report, recount, procedure, persuasion (exposition), description and explanation; whereas in linguistics, discourse genres are often exemplified

in more concrete terms, such as stories, lectures, conversations, speeches, interviews, protocols, notices, advertisements, novels and diaries. While these sets overlap, they do not align because of the different theoretical frameworks that underpin them. To map across the literature, the most common terms are outlined in **Table 1**.

Much of what we know about the discourse of children and adults with language impairment and the majority of the published clinical tools come from picture descriptions (for adults [18]) and fictional narrative discourse (for children). Consequently, there is little clinical information available about expository or personal discourse. Although there is no widely used clinical tool including a procedural discourse, there is more evidence in the research literature for procedural discourse than for expository or personal discourses. However, there is little consensus about how to analyse procedural discourse or the indicators of impairment. Developmental research suggests that discourse skills develop in narrative discourse ahead of other discourse types [19], and in the aphasia research, there is evidence that different discourse types elicit different language, information content and information structures.

Discourse type (& definition)	Elicited example(s)	Real world example(s)
Narrative discourse	Cinderella story [9]	Campfire ghost stories
	Bus story test [10]	
	Squirrel story narrative assessment [11]	
	'Frog, where are you?' [12]	
	Peter and the Cat [13] Expression, Reception and Recall of Narrative Instrument—ERRNI [14]	
Procedural discourse	Can you tell me how you make a cup of tea?	Giving instructions or explaining how to do something, e.g. getting up to the slide from the climbing frame, completing a maths problem, assembling flat-pack furniture, or using a specific function in an IT programme
	Can you tell me how you would wrap a box in paper for a present?	
	Tell me about what you normally do on Sundays?	
Personal discourse	Tell me about your stroke what did you do at the weekend?	Explaining a playground situation or argument; recounting your day; talking about life events (e.g. giving 'news' in class); taking something back in a shop
Descriptive discourse	'Cookie theft' picture description from the Boston Diagnostic Aphasia Examination [15]	Describing scenes observed, e.g. beautiful views from holiday, car crash on the way into work
	'Picnic scene' from the Western Aphasia Battery [16]	
Expository discourse	What is your favourite game or sport? Why is it your favourite game? [17]	Arguing, persuading and advising, e.g. political discourse or classroom questions that require a student to reason about a situation, identify cause and effect or justify their opinions

Table 1. Discourse types and examples.

2.2. Discourse development

Although standardised norms are lacking in the field, a large body of evidence about discourse development [20–23] provides normative evidence, meaning clinicians can assess children's discourse skills. Berman [19] summarises the evidence base that indicates that the development of discourse ability starts very early (by the age of 2 years) when children first start talking about events (although 2 and 3 year olds cannot construct a discourse autonomously without scaffolding from an external stimuli, such as a picture book or by responding to an older conversational partner). By 5 years old, general discourse structure has been established (beginning, middle, end), but is context and task dependent. For example, 5-year-old children find personal narratives easier than producing fictional narrative discourse because they have not yet developed the discourse skills needed to provide the necessary background information or evaluative comment (expected by 10 years of age but perhaps not fully proficient until adolescence). Within this evidence base, Berman [19] distinguishes three broad theoretical approaches to discourse development in which each give more detail on specific components of discourse. The three approaches focus either on (1) the relationship between linguistic form and discourse function; (2) elements of discourse content or (3) the structural features of a well-formed discourse. This distinction aligns with the approach taken in the whole of this chapter, in which we discuss (1) how language is used, (2) what information is included and (3) how the information is structured.

2.2.1. Development of the use of language for particular discourse functions

In this group of studies, the focus is the relationship between linguistic forms (words, phrases and sentence structure) and the functions that these forms perform in discourse (e.g. reference, temporality, connectivity). Much of the research in this area uses the 'Frog Story' wordless picture book as a means of elicitation [e.g., 21, 22]. In discourse, reference is a means of introducing participants and maintaining reference to them or shifting reference to other participants. Although the linguistic forms needed for referencing are available to pre-school children (e.g. proper nouns, indefinite and definite noun phrases, pronouns), the ability to make appropriate reference is a later-developing ability [24]. Referencing develops later because of the cognitive difficulty involved in keeping information in mind across the discourse. For example, the speaker needs to keep track of what/who has been mentioned, when and how (memory) and take into account shared speaker-listener knowledge. This provides listeners with appropriate amounts of information at each point in the discourse (drawing on theory of mind, memory and pragmatics). This field of research has also highlighted the use tense morphology for storytelling purposes [19]. For example, Berman and Slobin [22] identify an 'anchor tense' (typically past and/or perfect forms or, in picture book storytelling, on-going present tense) used consistently across the discourse by all children, with older children also varying tense for pragmatic effects such as foregrounding and 'flashbacking'. Another key finding relates to words marking connectivity in a discourse: as children develop, they increasingly supplement 'and' with other words such as 'because', 'so', 'next' and 'then' [22, 23]. This work on connectivity complements traditional school-based studies of written discourse based on 'T-Units' [25] or 'C-Units' [26], a count of the number of clauses as a proxy measure of syntactic complexity (a lower number of clauses representing more densely packaged clause structure and therefore a higher degree of syntactic complexity).

2.2.2. Development of discourse information content

Labov's work [27, 28] on 'narrative evaluation' is perhaps the best-known study to look at discourse information content. Labov and Waletzky [28] collected over 600 discourses from inner-city adolescents in the USA (asked to tell about a life-threatening experience) and analysed the temporal sequencing within them. Labov distinguishes 'referential information' (about the characters and events in the story) from 'evaluative information' (about a character's motivation, emotion or internal state). Referential elements form the 'plotline' of the discourse and usually move from background orientation via an initiating event to the central events in the discourse before the resolution is reached. In Labov's research, adolescent narrators typically marked resolution with evaluative comment [28]. Peterson and McCabe's [23] study of the personal narratives of 4–10 year olds built on Labov's work, identifying six patterns of personal narrative storytelling, with only the older children consistently using the full structure described by Labov, while younger children either ended in the middle of the discourse (at the complicating event or 'high point') or used a simple 'chronological' structure. They also found that, with age, children make reference to more, and more different types of, evaluative elements. A complementary body of work looking at the emergence of discourse content is provided by Applebee [20] whose work acknowledges that young children begin with producing discourse in a much less mature way because their language and cognition are still developing.

2.2.3. Development of discourse information structure

The most widely used framework for looking at the structural features of a well-formed discourse is story grammar. While various story grammars have been proposed since the late 1970s, Stein and Glenn's [29] study is the most widely cited source. Story grammar describes both the speaker's knowledge of narrative discourse structure and the listener's internalized framework used to comprehend the discourse. The elements composing the discourse are defined as abstract categories (e.g. setting, episodes, outcome) with each episode having the potential to subdivide (e.g. into initiating event, goal, plot, resolution). Stein and Glenn asked first- and fifth-grade children (equivalent to key stage 1 in UK primary schools, which is age 6–7 years, and key stage 2, 10–11 years) to retell short simple stories they had heard. The older children remembered the stories better than the younger children, while the younger children recalled only referential information (mainly events), the older children also recalled evaluative comments [29]. Stein and Glen's research forms the basis of a large body of subsequent story grammar work, where consensus suggests that by 6 years, children can recount stories they have encountered in the expected (adult like) order of a story grammar, although they would not necessarily recall the exact wording of the original. It is important to note that story grammar research has generally focused on children's comprehension and recall of narrative discourse rather than on spontaneous narrative production and so does not deal directly with children's developing abilities in the construction of discourse. In their exploration of narrative discourse in adolescents with DLD, Wetherell et al. highlight the dispute in the literature about the age at which children complete development of narrative discourse [30]. Although some researchers argue that the development of narrative ability is achieved by 10 years old, some aspects of discourse skill—such as length, syntactic complexity, episodic density and evaluative comments—continue to increase throughout adolescence and into adulthood [21].

2.3. Discourse in healthy ageing

Successful discourse production relies on language and cognition, both of which are likely to change as a result of healthy ageing. Understanding how these changes affect discourse is paramount to recognising impairments. If discourse changes as a result of healthy ageing, we do not expect healthy adults to produce perfect discourses and so, our benchmark when considering clients with impairments is the imperfect discourse of healthily ageing adults, rather than a perfect discourse. Evidence suggests that in healthy ageing, we should expect changes in the length of a discourse; the syntactic structures a speaker uses; the cohesion of the discourse; the amount of information a speaker is able to communicate and also the overall coherence of the discourse.

2.3.1. How language is used in discourse

In general, older speakers produce longer discourses than younger speakers. In the following studies, 'older' is a term most often used for people aged 60 plus, and 'younger' most often means people younger than 40. Older speakers have larger vocabularies than younger speakers [31], although they are likely to have more trouble with confrontation naming tasks [32]. Older speakers are more likely to give more detail in their discourses and to provide more explanation than younger speakers [33], which may result in them producing longer discourses. However, discourse length may be affected by the discourse type: although Juncos-Rabadán et al. [34] found that older adults produce longer narrative discourses, Ulatowska et al. [35] found that the length of procedural discourses produced by younger and older adults was similar. Glosser and Deser [36] found no difference in lexical production errors between younger and older adults, suggesting that ageing is not associated with more lexical errors. Reduced syntax may occur as a result of healthy ageing. Walker et al. [37] found that older adults aged 60–91 years produced shorter sentences than college students, and that those shorter sentences also contained fewer embedded clauses; and Kemper and colleagues found a reduced range of complex syntax in older adults [38–40]. However, other studies suggest no difference between the syntax use of younger and older adults [41, 42]. This conflicting picture may be based on differences between discourse genres or on differences between sentence-level methods of measurement. Reduced syntax is therefore not necessarily an indicator of impairment.

2.3.2. What information is included in discourse (coherence)

Information content in a discourse can be measured in countable 'units' of information, in how relevant that information is or how logically it links together. Communicating information and marking how it relates to other information may change as a speaker ages. Older speakers are likely to produce discourses with less information, or less dense information content, than discourses produced by younger speakers [34, 35, 43]. Furthermore, when compared to younger speakers, older speakers are likely to produce discourses which are less coherent overall and more likely to contain irrelevant information [34, 36, 44]. Glosser and Deser [36] measured local coherence, using a method which focuses on how well each utterance relates to the previous utterance, and found that while older adults produced discourse that was less coherent overall, the coherence relationships between neighbouring utterances

were the same in younger and older adults. Taken as a whole, the evidence base suggests that the processes in a discourse which are most vulnerable to the ageing process are likely to be, the amount of information, relevance of information, and overall coherence of information in discourse.

2.3.3. How information is structured is discourse (cohesion)

Cohesion in discourse relates to the extent to which a text 'hangs together', a process which might be vulnerable in ageing. Grammatical cohesion is based on the structural content of language [45], for example, the ways a speaker uses language to create links between characters across more than one sentence (for example, Cinderella…. She… Her). Older adults use more ambiguous and non-specific references than younger adults [34, 46]. For example, Ulatowska et al. [46] focused on the difference in referential cohesion in younger and older adults and found that older adults had a greater quantity of *referential ambiguity*, such as in the utterance 'so the policeman talked to him for a short time, and then, he went on his way', where it is unclear whom the 'he' relates to. Therefore, some degree of incomplete or unclear referential cohesion may be a feature of healthy ageing in the discourse of older adults.

The patterns in discourse produced by healthy children developing and healthy adults ageing are important for clinicians, so that they have a context against which to evaluate the discourse patterns in DLD and aphasia.

2.4. Discourse patterns in DLD and aphasia

2.4.1. Discourse patterns in DLD

Discourses produced by children with DLD are impaired in terms of their language content. Children with DLD produce shorter, less cohesive stories that are syntactically simple and contain frequent errors of syntax, semantics and morphology [47, 48]. Botting [49] compared the narrative discourse of children with DLD ($n = 5$) to children with autism. She found that children with DLD produced less 'socio-cognitive' and 'affective' vocabulary (which included mental verbs such as 'think' and 'know'). In terms of information content and information structure, some authors report a relative lack of difficulty with discourse production by children with DLD. For example, there is evidence of unimpaired cohesion (as measured by accurate referencing [50]). However, this finding is not unanimous, and the other research suggests that cohesion is a key factor distinguishing children with DLD and their typically developing peers [50]. With regard to global discourse structure, the evidence regarding children with DLD is also contradictory. Merritt and Liles [51] found that older children with DLD produced fewer elements of story structure than their age-matched peers; however, Liles et al. [48] found that global organization factors did not distinguish children with DLD from typically developing controls after local structure (i.e. cohesion) was accounted for. So while the evidence for language difficulties in DLD discourse is clear, the picture regarding communicating information is less so. This pattern is echoed in the evidence base about the discourse of people with aphasia (PWA).

2.4.2. Discourse patterns in aphasia

Speakers with aphasia produce discourse that is impaired in terms of syntax [52–55]. Evidence from retellings of the Cinderella story is a particularly rich source of information about syntactic difficulty for PWA [9, 55, 56]. Analysis of this fairy tale narrative discourse has revealed that aphasia reduces the proportion of narrative words, the elaboration of noun and verb phrases and complex syntax [9, 55, 56]. Whitworth [56] found that speakers with aphasia used a preponderance of semantically light verbs, such as 'go' and 'make', which lack semantically rich information. Cruice et al. [57] explored the language used by PWA in their responses to questions about their quality of life. Similar to the Cinderella discourses, in their quality of life discourses, PWA produced syntactically less complex sentences than healthy people. Turning to information content and information structure, there is some disagreement in the evidence base. There are a group of studies which suggest that PWA produces the *same* amount information in the discourse as healthy speakers; however, there is a larger body of evidence indicating that PWA produces *less* information that they and also that PWA link information *less clearly* to the overall topic (see the review by Pritchard et al. [58] for an evaluation of the quality of these studies). There is also evidence suggesting PWA produce varying amounts of information and that they structure it differently in different discourse types (narrative, procedural, expository, etc.) [58].

In summary, both PWA and children with DLD tend to produce discourse that is shorter, with fewer complex sentences and less diverse vocabulary, that may contain less core information and which may include fewer overt markers of informational structure when compared with the discourse produced by neurologically healthy adults and typically developing children. These characteristics of communication impairment indicate that all three central components of discourse *can* be affected (language, information, information structure). However, these components will not always be affected in impaired speakers, and there is evidence to suggest that abilities in the three components are not always correlated.

2.5. Discourse assessment and therapy

Discourse is a popular way to elicit language for the assessment of communicative skills for a broad range of reasons. Oral discourse provides a rich source of data about language use in a comparatively natural context and allows researchers and clinicians to assess multiple linguistic and discourse elements using relatively short language samples—elements that can be assessed in this way include how language is used, what information is included and how the information is structured. Discourses occur cross-culturally, both within conversation and in stand-alone contexts. We focus on monologic discourse because even though discourse and conversation are not entirely distinct entities, conversation is subject to additional processes (notably the input from the conversation partner). The assessment of discourse is recommended in many best practice guidelines for both adults with aphasia and children with DLD, numerous assessment tools and methods exist, and many of these methods are transferrable across client groups. However, there is little information to guide the clinician about how to choose between them. In the next sections, we outline a core set of the most common methods

and indicate of the theoretical framework and/or evidence base underpinning them. It is important to consider the theory and evidence base for assessment tools because the codes of practice governing speech and language pathology (therapy) worldwide state that clinicians should base intervention on the best available theory and research evidence.

2.5.1. Discourse assessment for children with DLD

2.5.1.1. Assessment approaches and informal assessment methods

The discourse abilities of children with DLD have been analysed in two different ways: (1) focusing on the information content and information structure in the discourse and (2) focusing on the language content in the discourse. Approach (1) is sometimes referred to in the clinical literature as macrostructure analysis and approach (2) referred to as microstructure analysis. The two most widely used models of macrostructure are story grammar and high point analysis. Story grammars represent the speaker's knowledge of the elements that constitute a well-formed story [29]. These elements can be related to the early stage in the Sherratt's model (referred to at the beginning of Section 2) in which the choice of a particular discourse type constrains the choice of information included, as well as the structuring of that information. For example, if a speaker was choosing a narrative discourse, they would require some story grammar elements, while in procedural discourse, they would require different elements. Stein and Glenn's story grammar [29] is the most widely cited source and is based on evidence from an empirical study of school-aged children. These authors suggest that well-structured narrative discourses should contain a setting and one or more episodes (linked sequentially, temporally or causally), and that each episode has the potential to include an initiating event, an internal response, a plan, an attempt, a consequence, and a reaction. Other story grammars also include information about characters, place and time; and character responses, including internal states (emotions and mental states). Story grammar approaches are popular clinically to judge the quality of a discourse and this approach underpins many published clinical tools (see **Table 2**). Although the story grammar approach does not provide detailed developmental information, Stein and Glenn reported that the percentage of story grammar elements in a discourse increases with child's age (between US Kindergarten and third grade; UK pre-school and the beginning of key stage 2; between the ages of 5 and 9) and that the majority of the children of all ages used causal relations in their discourses, although older children use more. There are, however, no standardised norms for which elements of story grammar to expect at particular stages of development. High point analysis is broadly parallel to story grammar and is derived from Labov and Waletzky [28]. The elements used in high point analysis include information about setting and events but focus in particular on evaluation. Evaluation reflects these aspects of the discourse that the narrator highlights, including references to characters' internal states, use of dialogue and stress and intonation, which signal the story's climax or 'high point' and reveal which events are salient or meaningful to the narrator.

In children's discourse microstructure, the most commonly identified aspects of language in discourse assessment include vocabulary, grammar and cohesion—a term for the linguistic devices used to link sentences to one another, such as different noun phrases linked to each other or pronouns linked to noun phrases (e.g. the links between 'the poor servant girl', 'the beautiful girl in the blue gown', 'Cinderella', 'she' and the pronoun 'her' in the phrase 'her

Assessment	Type of discourse	Scoring	Norms	Age range
Bus story [10]	Narrative retell From heard story with pictures	*Macrostructure*—scores for (a) information (i.e. key content contained in the story) *Microstructure*—scores for (b) sentence length (c) complexity (i.e. subordinate and relative clauses) *Other*—scores for (d) independence (level of cueing/prompt).	Yes	3–8 years
Squirrel Story [11]	Narrative retell	*Macrostructure*—scores for (a) story structure and (b) story content (follows story grammar framework) *Microstructure*—scores for (c) vocabulary and (d) language level *Other*—scores for (e) listening and attention	Guideline scores based on sample of 100 children	3–6 years
Peter and the Cat [13]	Narrative retell	*Macrostructure*—scores for (a) story structure and (b) story content (follows story grammar framework) *Microstructure*—scores for (c) specific words/vocabulary (conjunctions, adjectives, adverbs) and specific phrases (adverbial prepositional phrases) (d) for reference chains	No	5–9 years
Expression, Reception and Recall of Narrative Instrument [14]	Narrative generation and recall (i) from picture sequence and (ii) recalled after 30 min delay	*Macrostructure*—scores for (a) story content *Microstructure*—scores for (b) mean length of utterance *Other*—scores for (c) story comprehension probe questions (three literal and six requiring inference)	No	4 year-adult

Assessment	Type of discourse	Scoring	Norms	Age range
Narrative subtest of the assessment of comprehension & expression—ACE [59]	Narrative retell, using eight picture cards. Immediate recall	*Macrostructure*—none *Microstructure*—count of (a) the number of target words and phrases the child includes in the story retell; and (b) the number of syntactic forms and discourse features, such as tense, direct speech and questions, a child uses in the story retell	Y: Standard scores calculated from raw scores	6–11 years
the discourse analysis profile—DAP [60]		*Macrostructure*—(a) topic maintenance; (b) informativeness; (c) event sequencing (d) referencing. *Microstructure* (e) The correctness and range of conjunctions; (f) Fluency (the manner of production, including phrase and word repetitions, abandoned utterances, lexical substitutions, pauses and fillers) For (a)–(f), a subjective judgment of appropriate/inappropriate must be made		

Table 2. Summary of commonly used paediatric discourse assessments.

glass slipper'). The linking of pronouns back to a noun phrase is referred to in the literature as a reference chain. Microstructure is not a feature of either story grammar or high point analysis, and there is no integration between macrostructure and microstructure in these approaches. Clearly, both microstructural linguistic features and macrostructure are of key interest in a clinical evaluation because both are essential for creating a coherent, meaningful discourse. The existing models of discourse production support this contention that integration is key to coherent discourse production.

2.5.1.2. Clinical assessment tools

There are a number of widely used published clinical tools for assessing discourse, each with clear and structured scoring protocols relating to some or all of the macrostructural

and microstructural elements of discourse outlined above. In **Table 2**, we provide a detailed description of each. The most widely used tools in **Table 2** assess only narrative discourse, and so clinical assessment of other types of discourse must be done using informal means.

2.5.2. Discourse therapy for children with DLD

In the paediatric field, there is a growing body of literature about interventions to both improve elements of discourse macrostructure and to facilitate the microstructural linguistic components (i.e. words and sentences) used in discourse. Petersen [61] completed a systematic search for *narrative* discourse intervention for children with language impairment, reviewing nine studies published since 1980. We ran a search in 2017, expanding the criteria to all discourse types, not just narrative discourse. In both reviews, the search terms used were intended to capture studies in which discourse therapies were described. In other words, we were looking for studies describing interventions using *discourse techniques* rather than interventions which aimed to improve discourse but which used *language techniques*. While there are a large number of studies that work on language with the ultimate goal of improving discourse, there are fewer studies that work directly on discourse. Our own review identified seven studies, three of which overlapped with the Petersen review. Therefore, the coverage of the combined reviews includes 13 interventions. This means that there are only 13 studies published in the past 40 years that outline intervention programmes aimed at improving the information content and structure of children's discourse. This is despite the fact that discourse is the basis for the vast majority of everyday communication, such as talking about your day or sharing an opinion.

The combined review of the literature captured a broad range of therapy approaches including both classroom-based intervention and individualized therapies. There was some overlap in the use of materials across the reviewed intervention studies, with the majority using single photos or pictures to elicit narratives and around half using a wordless picture book and/or role playing. Perhaps surprisingly, there was little overlap between the intervention protocols of the studies. Procedures included the modelling of narrative discourses to the child, for them to practise and re-tell [62, 63]. Other interventions required the child to generate their own narrative discourse, either spontaneously or from a stimulus such as a picture cue [62]. Another procedure involved asking the child 'probe questions', to elicit missing discourse information (missing story grammar components), such as asking 'What happened then?', 'Why?' and 'How did that make her feel?' [63]. And finally, there were interventions in which children were given key sentences to repeat and then use in a discourse [64]. These combined reviews also uncovered important evidence that narrative discourse intervention for children with DLD is effective. The vast majority of the reviewed studies resulted in positive discourse outcomes for the child [62–67]. In particular, the evidence suggests that there are two key components to successful discourse intervention with this group of children: (1) interventions should involve encouraging a child to repeatedly retell targeted discourse and (2) interventions should emphasise discourse information content elements. The evidence base indicates that such an approach will facilitate improvement in both discourse macrostructure and some aspects of language because it will improve the child's ability to use language for discourse purposes. These findings should encourage clinicians to treat narrative discourse as a functional language target as well as a format through which language can be remediated.

2.5.3. Discourse assessment for adults with aphasia

A large field of literature explores the discourse of adults with aphasia (see review by Linnik et al. [18]), with speakers experiencing challenges at single word and sentence levels as well as with cohesion, coherence and general discourse organisation. Difficulties with information content and organisation may be related to difficulties with language [68]. For example, a speaker with anomic aphasia may be unable to find the specific words required for the discourse and so may leave information gaps. A number of different clinical aphasia batteries each includes a discourse component, which is commonly a task requiring a speaker to describe a black and white line drawing: the Western Aphasia Battery [16], for example, has a scene depicting people having a picnic, some children and a house beside water. Where an overall aphasia profile is available from such assessment batteries, performance on the discourse task is often a substantial component of this overall score. The weight given to discourse in the batteries underlines the fact that discourse production is likely to be a core difficulty for speakers with aphasia. In the aphasia batteries, picture description tasks are generally scored in terms of the language a speaker uses, and the information they are able to communicate. To take the Western Aphasia Battery as an example, for the 'spontaneous speech' task, a 1–10 scale is used for rating a speakers' fluency, grammatical competence and paraphasias, and a 1–10 scale is used for information content (yielding a maximum 'spontaneous speech' score of 20). The aphasia test batteries provide a useful starting point for describing discourse in speakers with aphasia and for identifying a difficulty with information content or language. However, further assessment or analysis will be required to pinpoint the source of a speaker's difficulty or to measure change as a result of therapy. The research literature offers an extensive catalogue of methods for assessing discourse, including discourse-language measures (e.g. assessments of syntactic complexity and counts of narrative words) [69] and discourse-information measures (e.g. story grammar and ratings of coherence) [58]. Although the psychometric properties of discourse measures are still under investigation [58], it is likely that such measures will provide a finer grained evaluation of discourse impairment than will aphasia batteries. Discourse elicitation methods for PWA in the research literature include picture descriptions, narrative discourse retelling (from memory or wordless picture books), personal narratives (e.g. the story of when they had their stroke), procedural discourses (e.g. how to change a light bulb) and expository discourse (e.g. the reasons for political affiliation). These elicitation methods are likely to produce discourses that are structured differently, for example a descriptive discourse may contain more listing than a fictional narrative. Therefore, it is important to reflect on how we expect different discourse types to appear, before selecting an elicitation method for assessment. For example, if we hypothesise that a client has difficulty with cohesion, we should select a discourse that is likely to use cohesion, such as a narrative discourse with multiple characters, in order to test this hypothesis. Due to the number of aspects of discourse which can be measured, a hypothesis-testing approach is likely to be appropriate for clinical use. There are 58 methods for measuring the information content and information structure in the discourse of speakers with aphasia [58] and 565 methods for measuring language used in discourse by speakers with aphasia [69]. The sheer number of different

methods for measuring how language, information and information structure is measured increases the importance of using clinical judgement.

2.5.4. Discourse therapy for adults with aphasia

In the field of aphasia, as in the paediatric literature, there is a much larger evidence base about discourse assessment methods than about discourse intervention approaches. We reviewed the literature and identified studies that described both discourse treatment and discourse-based outcomes of interventions (as opposed to those studies in which a language intervention is evaluated with a discourse-based outcome, of which there are many more). The studies on discourse intervention that we found comprised three distinct approaches to the improvement of discourse (in some studies, more than one approach is used). One approach targets word and sentence production (simple and complex clauses) within discourse [56, 70–74]; another involves massed practice of whole discourses, using AphasiaScripts [75–77] and a third focuses on supporting participants to improve their discourse macrostructure using story grammar [56, 64, 68, 78]. Overall, the findings from these studies were positive, with clients' improving in language use, the amount and quality of information conveyed, and how the information was structured, although it was not the case that all three elements improved in every case. Specifically, intervention improved those areas which were focused upon in intervention. This suggests that to make an impact on discourse, specific targeting of challenging features is likely to be appropriate.

2.6. Summary and conclusions

This chapter has outlined how speakers construct discourse in everyday situations in terms of the language used; the information included; and the way the information is structured. Current methods for discourse analysis were outlined and key developments in narrative discourse production therapy were reviewed. Currently, there is sufficient evidence to be sure that certain elements are crucial to consider in the assessment and treatment of discourse. First, it is likely that discourse type affects the skills that speakers are able to demonstrate. Second, macro and microstructure are likely to differ, and assessment and therapy should target both. Third, clinical judgement should be used to select from the myriad of published assessments in the field. Finally, emerging multi-level therapies are proving to be successful and are likely to be the best approach to addressing difficulties with discourse. There is some consensus beginning to arise from the evidence base on essential targets for intervention and effective methods for improving discourse, and overall discourse is a promising area for speech-language pathology and therapy.

Author details

Lucy T. Dipper* and Madeleine Pritchard

*Address all correspondence to: l.t.dipper@city.ac.uk

City University of London, London, United Kingdom

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