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Clinical Focus

A Tutorial on Expository Discourse: Structure, Development, and Disorders in Children and Adolescents

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Purpose: With the adoption of the Common Core State Standards, expository texts gain prominence at all grade levels and for all disciplines. Although the linguistic and cognitive complexities of exposition pose challenges for all children, they may create additional challenges for children and adolescents with language difficulties. Therefore, this tutorial provides background information for clinicians regarding the structure, development, and specific difficulties associated with exposition across the 4 modalities of listening, speaking, reading, and writing. This background is intended to help direct the attention of researchers and clinicians to needed advances in knowledge and skill if the profession is to adequately support the population of children and adolescents who struggle with language.

Method: This tutorial is based on an extensive narrative review of articles identified using a systematic search process. Cited research studies are discussed qualitatively, but intervention studies are also characterized in terms of the strength of their research designs. This method is undertaken to highlight the strengths and weaknesses of the current state of research on these topics.

Conclusions: Future research needs are proposed to promote discussion among researchers and to prepare clinicians for the kinds of evidence they should be demanding as a basis for their practice.

Discourse—the sequential organization of language beyond the sentence level—can be categorized as conversation, narration, persuasion, or exposition (Nippold, 2014; Scott & Windsor, 2000). Conversation is the discourse of everyday life, narratives are the discourse of storytelling, and persuasion is the discourse used to influence others' actions or thoughts. Exposition, sometimes called the "language of the curriculum" (Ward-Lonergan, 2010), is the discourse encountered in textbooks, classroom lectures, technical papers, and documentaries in which the goal is to impart information to a listener or reader.

Expository discourse recently has gained increasing academic prominence across grade levels and subject areas as part of the curricular recommendations incorporated in the Common Core State Standards (CCSS; Common Core State Standards Initiative, 2015). In addition to its academic importance, expository discourse has implications for social functioning because it is utilized when telling someone the steps in a new task or explaining the rules of a game. Thus, challenges in learning how to understand and produce expository discourse have academic and social repercussions for children and adolescents, including those with and without language disorders (LDs).

Little research has focused on the development of expository discourse despite its academic and social importance. Therefore, the goal of this clinical focus article is to synthesize the literature from several relevant disciplines (education and literacy, linguistics, psychology, and speech-language pathology) in order to present an overview of expository discourse as it relates to the language of children and adolescents for the benefit of research and clinical audiences whose work focuses on language development and disorders. This tutorial discusses expository discourse in four language modalities: reading, writing, listening, and speaking. Exposition is discussed in its written form (frequently referred to as *expository texts*) and more broadly in both written and oral forms (referred to here as *expository passages*).

Relevant articles were identified through broad computerized searches of the literature covering 2005 to 2015 using the following databases: PsycINFO, ERIC, PubMed, CINAHL, Web of Science, and Google Scholar. The search

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terms *expository, informational,* and *discourse* were used alone and in combination with the search terms *child*, student*,* and *adolescent*. Articles prior to 2005 were included when the historical background was needed to inform research questions in the current literature. Despite the systematicity of the search we performed, the review on which this tutorial is based does not follow other aspects of systematic review methodology (Marshall, Goldbart, Pickstone, & Roulstone, 2011), including our consideration of studies at various levels of evidence. Nonetheless, to promote transparency concerning these varying levels of evidence, we provide a levels-of-evidence table for intervention studies and use asterisks in the References to indicate all research studies (including developmental and comparative studies, for which a levels-of-evidence table would not be appropriate).

This tutorial is organized so that we first provide an overview of the distinctive characteristics of expository discourse, including how they are affected by the unique disciplinary demands facing children and adolescents in academic settings. Next, we discuss what is known about the development of exposition in written and spoken language. Last, we describe the nature of the challenges posed by expository discourse for children and adolescents with language problems. We end the tutorial by identifying specific research needed to provide a stronger evidence base on which valid assessments and treatments can be constructed.

The Nature and Distinctive Characteristics of Expository Discourse

Expository discourse is more linguistically complex than other forms of discourse and has been shown to be more challenging to comprehend and produce, even for adults and children with typical development (Nippold, Hesketh, Duthie, & Mansfield, 2005; Scott & Windsor, 2000). As a consequence, understanding its distinctive features and processing demands is particularly important for speech-language pathologists (SLPs) serving children and adolescents who may experience challenges with language overall or with written language in particular. In this section, we review the unique microstructural (lexical- and syntactic-level) and macrostructural (text-level) characteristics of well-formed expository discourse (see Tables 1 and 2 for examples), consider the cognitive processes necessary for its competent production and comprehension, and discuss the relationship of these characteristics to disciplinary literacy.

Lexical Characteristics

Because the information it conveys is often novel, exposition commonly includes low-frequency words associated with unfamiliar or abstract concepts (Nippold, 2014; Snyder & Caccamise, 2010). It also tends to contain more morphologically complex words (Nagy & Townsend, 2012), often created using prefixes and suffixes that can alter a word's more familiar meaning, its syntactic function, or both (Nippold & Sun, 2008). Other lexical challenges of exposition include copious use of technical vocabulary—words with meanings that are difficult or impossible to deduce from context (see Table 1; Fang, 2012; Schleppegrell, 2001) and that therefore depend heavily on prior knowledge for understanding.

Within the three-tier vocabulary hierarchy described by Beck, McKeown, and Kucan (2008), expository discourse differs from narratives and conversation in its higher proportion of vocabulary falling in the highest two tiers (Fang, 2008; Kinsella, 2013). Within that system, Tier 1 vocabulary consists of basic vocabulary used in everyday life that rarely requires instruction. In contrast, Tier 2 vocabulary consists of more advanced academic words with wide applicability across subject areas (e.g., *discuss, analyze*) and more specific vocabulary that describes objects and interactions (e.g., *antique, ancient*). Tier 3 vocabulary consists of rarely used words and discipline-specific, highly technical words that have limited usage outside of a given discipline (e.g., *osmosis, hydrolysis*). It is suggested that comprehension tends to be poorer for texts with a higher concentration of the vocabulary associated with these higher tiers (Beck et al., 2008; Fang, 2006). Yet using and understanding such sophisticated vocabulary is essential for later reading comprehension and writing abilities, as shown by studies documenting a strong, reciprocal relationship between both receptive and expressive vocabulary knowledge (or word recognition) and both later reading comprehension (Lee, 2011; Quinn, Wagner, Petscher, & Lopez, 2015; Wise, Sevcik, Morris, Lovett, & Wolf, 2007) and writing abilities (Dockrell, Lindsay, Connelly, & Mackie, 2007).

At the level of individual sentences, the way in which vocabulary items are deployed through discourse passages is also more linguistically complex in exposition than in narratives and conversation. Compared with those discourse forms, exposition entails (a) higher lexical density (evidenced by a greater number of content words per clause; Schleppegrell, 2001) and (b) greater lexical diversity (evidenced by a greater number of unique words within the text; Fang, 2008; Schleppegrell, 2001; Westby, Culatta, Lawrence, & Hall-Kenyon, 2010). Thus, word by word and sentence by sentence, exposition surpasses other discourse genres in the lexical challenges it presents. Further, because these demands are even more pronounced in written than in oral language, their mastery increasingly is viewed as necessary for academic success (Beck et al., 2008; Kinsella, 2013).

Syntactic Characteristics

The expression of complex relationships and ideas in expository texts requires the use of more complex syntactic structures than those found in other discourse types (Westby et al., 2010), except perhaps persuasion. In fact, when compared with the most frequently examined discourse types—conversation and narration—expository passages are associated with greater syntactic complexity in both oral (Nippold et al., 2005; Nippold, Mansfield, Billow, & Tomblin, 2008; Scott & Windsor, 2000) and written (Berman & Nir-Sagiv, 2007; Scott & Windsor, 2000) modalities.

Table 1. Microstructural features characteristic of expository discourse, with examples from high school textbooks.

Expository characteristic	Example
Lexical	
Highly technical vocabulary	Members of the *phylum Sarcodina,* also called *sarcodines*, are animal-like *protists* that use *pseudopods* for feeding and *locomotion*. (Biggs et al., 2009, p. 550)
Syntactic	
Nominalization	Memory cells *protect* the body by reducing the likelihood of developing the disease if exposed again to the same pathogen. Sometimes temporary *protection* against an infectious disease is needed. (Biggs et al., 2009, p. 1089)
Pronominalization	Hard economic times put groups of Americans in competition with one another for a shrinking number of jobs. *This* [shrinking number of jobs] produced a general rise in suspicions and hostilities against minorities. (Cayton, Perry, Reed, & Winkler, 2007, p. 517)
Pre- and postmodification of nouns	*At dawn on D-Day, the day the invasion of Western Europe began, Allied* warships *in the channel* began a massive shelling of the coast. (Cayton et al., 2007, p. 606)
Subordination	
Nominal	Industry leaders worried *that the new regulations would be overly complex and costly to businesses*. (Cayton et al., 2007, p. 784)
Relative	The fears *of those who criticized Woodstock* came true at another rock festival held at the Altamont Speedway in California in December 1969. (Cayton et al., 2007, p. 780)
Adverbial	*Once the primers are bound,* DNA polymerase incorporates the correct nucleotides between the two primers as in DNA replication. (Biggs et al., 2009, p. 369)

Note. Examples come from high school science (Biggs et al., 2009) and ninth-grade history (Cayton et al., 2007) textbooks. Italicized text indicates those portions of the text serving as illustrations.

Several syntactic features may contribute to this complexity, including (a) nominalization and noun modification, (b) subordination, and (c) clauses that highlight the structure and importance of information (for a more detailed review, see Scott & Balthazar, 2010).

Nominalization is the use of a noun or noun phrase to convey meaning that may be more commonly expressed using a verb (e.g., *presupposition/suppose*) or adjective (e.g., *significance/significant*; Fang, 2008; Fang, Schleppegrell, & Cox, 2006; Schleppegrell, 2001). As in these examples, nominalization often involves the addition of a prefix or suffix to the root word, but in some cases no changes are needed (Nagy & Townsend, 2012; Nippold & Sun, 2008). For example, a verb may be nominalized to function as a noun, as in "The general *ordered* his troops to retreat. This *order* gave the advancing army a distinct advantage." Nominalization serves as a tool for summarizing previously presented information. As shown in Table 1, the noun *protection* allows the author to quickly summarize what has already been presented or is already known ("Memory cells protect the body…") so that additional, new information can be added or a description can be expanded. Pronominalization incorporates similar syntactic changes (Hall-Kenyon & Black, 2010), using a specific pronoun such as *this* or *these* to refer

Table 2. Descriptions of specific expository discourse macrostructures, with an example and signal words and phrases associated with each subtype.

Expository subtype	Description	Example	Macrostructural signal words and phrases
Descriptive	Provides information to describe an object, concept, or idea	The definition of global warming	For instance, an example of, to illustrate, such as
Procedural	Identifies steps required to complete a task	Procedures that could help slow global warming	First, second, then, last, following, next, until, at that time, during, before, after, meanwhile
Enumerative	Lists examples, ideas, or concepts related to a given topic	Physical changes to the earth that are examples of global warming	The following, additionally, another, likewise, besides, also
Cause/effect	Explains or gives reasons for particular events	Possible explanations for global warming	Because, as a result, effect of, consequently, so, therefore, in order to, may be due to, for this reason, if … then
Compare/contrast	Delineates similarities and differences between or among topics or events	An examination of the earth's climate today versus 1,000 years ago	However, also, similarly, as opposed to, both, instead of, either … or, on the other hand, but, despite, in comparison, in contrast, alike, unlike
Problem/solution	Identifies a problem and possible solutions	Possible solutions for a particular cause of global warming	Problem, reason, concern, issue, as a result, so that, possible solution, resolution

to previously presented content (see Table 1). Although nominalization and pronominalization foster cohesion within a passage by tying one sentence to another (Fang et al., 2006), they also present distinct challenges to listeners and readers. Nominalized words and phrases tend to be more abstract and removed from everyday experience compared with their verb or adjective counterparts. They also require a listener or reader to track referents carefully to ensure comprehension (Fang et al., 2006). It is not surprising, then, that comprehension can suffer for texts with a high proportion of nominalization, even among students who are typically developing (Fang et al., 2006; Scott & Balthazar, 2010).

Another syntactic characteristic of expository passages is the use of pre- or postmodification of a noun (or noun phrase), which increases the length and complexity of the affected subject or object noun phrase (Scott & Balthazar, 2010) and increases the cognitive demands of the expository passage. As shown in Table 1, postmodification of a noun can separate it from the main verb by one or more clauses, which may increase the burden on working memory (Fang, 2008) because the listener or reader must identify the noun and hold it in working memory in order to link it to the appropriate verb. Such modifications create lengthy, complex sentences whose comprehension requires significant processing capacity (Fang et al., 2006; Scott & Balthazar, 2010).

Increased use of subordination, achieved using embedded clauses, is another key syntactic feature that distinguishes expository from narrative and conversational discourse (Berman & Verhoeven, 2002; Nippold et al., 2005, 2008). In expository discourse, subordination facilitates the linking of ideas in a logical, hierarchical manner (Schleppegrell, 2001; Scott & Balthazar, 2010) rather than the linear, chronological fashion typical of conversation and narration. Table 1 provides examples of the three major types of subordinating clauses: nominal, relative, and adverbial. Increased use of subordination contributes to the greater syntactic complexity (Schleppegrell, 2001) needed to accommodate the potentially complex, descriptive, and relational information conveyed in an expository passage (Nippold, 2010). In turn, increased syntactic complexity (a) creates greater demands during the production of oral and written expository passages and (b) affects the comprehension of such passages by creating sentence structures that are less predictable, more difficult to segment, and, therefore, likely more taxing to working memory (Scott & Koonce, 2014).

Within sentences, clausal arrangement highlights informational importance and structure and constitutes an additional prominent syntactic characteristic of expository discourse. For example, consider the sentence "As the war ended, he [Harry Truman] introduced a 21-point program that included legislation designed to promote full employment, a higher minimum wage, greater unemployment compensation … and a variety of other items" (Cayton et al., 2007, p. 681). The use of an adverbial subordinate clause ("As the war ended") that precedes the main noun references already-presented (old) information and signals that new information is forthcoming (Scott & Balthazar, 2010). This clausal arrangement adds complexity by signaling the experienced reader or listener to recall what has just been imparted and allocate attentional resources differentially toward the end of the sentence, where important new information is shared (Schleppegrell, 2001).

Macrostructural Characteristics

Discourse macrostructure refers to how communications that are longer and more complex than a single sentence are organized. In contrast to narrative discourse, which is often organized using a chronological, agent-focused macrostructure (e.g., story grammar; Scott & Windsor, 2000; Snyder & Caccamise, 2010), expository discourse macrostructures vary depending on the subtype or purpose of the discourse (Schleppegrell, 2001; Ward-Lonergan & Duthie, 2013). Six subtypes typically are discussed: descriptive, procedural, enumerative, cause/effect, compare/contrast, and problem/solution (Bliss, 2002; Moran & Gillon, 2010; see Table 2). Each of these places different semantic and syntactic demands on production and comprehension (Scott, 2010) in both written and oral modalities. As a result, children and adolescents have been shown to perform differentially depending on a task's expository subtype and modality (Culatta, Hall-Kenyon, & Black, 2010; Ward-Lonergan, Liles, & Anderson, 1999).

Each subtype's macrostructure cues the listener or reader to focus on the specific information needed to determine the main idea of the passage (Gajria & Salvia, 1992) and identify key supporting details (Hall-Kenyon & Black, 2010). In both written and oral passages, expository subtypes frequently are indicated by specific vocabulary, whereas in written expository texts, subtypes may also be indicated by headings and subheadings (Westby, 2005; see Table 2). When reading an expository text, for example, a reader should understand that the phrase "as a result of" indicates a cause/effect text structure. Thus, knowledge of a particular macrostructure can cue the reader to identify and promote the integration of central points, over and above peripheral or extraneous ideas, to help facilitate comprehension, overall summarization, and later recall (Westby, 2005; Wolfe, 2005).

Background Knowledge and Cognition

Two particular cognitive domains or skill areas that interact with and underlie competent production and comprehension of expository discourse abilities are access and use of prior knowledge or domain-specific knowledge (long-term memory) and executive functioning (e.g., working memory, inhibition, shifting attention). Here we briefly discuss these processes as they relate to exposition.

Domain-specific background knowledge (Nippold et al., 2008; Snyder & Caccamise, 2010; Westby et al., 2010) must be accessed quickly and reliably for individuals to demonstrate competent production and comprehension of

expository discourse. Production requires access to background information if content of any complexity is to be produced, as a speaker or writer uses syntactic structures to draw attention to newly presented information. Comprehension similarly requires the integration of new information with previously learned, topic-specific knowledge so that the new content can be incorporated into memory (Nippold, 2010). It is not surprising that access to greater background knowledge has been shown to result in more syntactically complex oral productions (Nippold, 2009) and to support reading comprehension, even in more complex texts (McKeown, Beck, Sinatra, & Loxterman, 1992; McNamara & Kintsch, 1996). In production tasks, children with greater background knowledge and personal interest in a topic have been shown to generate expository samples with greater syntactic complexity than they demonstrated in conversational discourse samples (Nippold, 2009). In comprehension tasks, it has been suggested that ready access to previously learned knowledge may facilitate generation of the main idea and overall comprehension (Helder, van den Broek, Van Leijenhorst, & Beker, 2013; Westby, 2011). In fact, some studies have shown that prior knowledge plays a more significant role in recalling information from an expository text than from narratives, even when important cognitive factors such as working memory are held constant (Wolfe, 2005; Wolfe & Mienko, 2007; Wolfe & Woodwyk, 2010).

Prior knowledge also helps support a listener's or reader's ability to identify central ideas within a text or passage. The ability to recognize central ideas and suppress less relevant details is essential for identification of the main idea and key supporting details within a passage (Helder et al., 2013; Kim & Phillips, 2014; Miller & Keenan, 2009). Miller and Keenan (2009) summarized previous research findings with the term *centrality effect* and proposed that the more central an idea is to the main idea of the text, the more likely it is to be recalled, regardless of the passage's length or the reader's experience or reading ability. In a functional magnetic resonance study examining the neural correlates of expository discourse comprehension, Swett et al. (2013) further showed that the processing of central text ideas is neurologically distinct from the processing of peripheral ideas. Studies such as these have begun to identify the distinct cognitive–linguistic skills required for adequate production and comprehension of expository discourse, further emphasizing its unique role in communication.

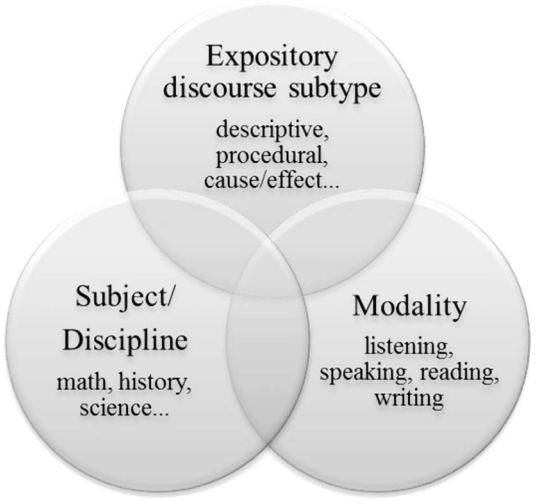
Complex linguistic behaviors (e.g., discourse) are highly dependent on other cognitive systems requiring executive control (e.g., processing capacity that affects speed of processing, working memory, attention; Ewing-Cobbs & Barnes, 2002; R. B. Gillam, Hoffman, Marler, & Wynn-Dancy, 2002). In fact, many of these cognitive abilities have been found to be related to expository discourse comprehension specifically (Berninger et al., 2010; St. Clair-Thompson & Gathercole, 2006). In order to process expository discourse passages in a timely, efficient manner, listeners and readers must demonstrate effective executive control, focusing primarily on key details and updating domain-specific background knowledge with new information held in working memory, while also processing complex linguistic information at both the micro- and macrostructural levels.

Disciplinary Literacy and Its Relationship to Micro- and Macrostructural Language Patterns in Expository Discourse

Variations in expository discourse characteristics by subject area can also affect a student's ability to manage discipline-specific texts and oral discourse—a source of challenge for young learners that is often addressed in the literature as *disciplinary literacy* (Ehren, Murza, & Malani, 2012; Fang, 2012; Shanahan & Shanahan, 2008, 2012). Widespread appreciation of disciplinary-related language demands has been instantiated in the CCSS through its adoption of a unique set of standards for major subject areas (Ehren, Lenz, & Deshler, 2014; Scott, 2014). However, such disciplinary-related language demands are not of interest just to educators whose primary focus is the bulk of young students who are developing oral and written language typically. SLPs must also recognize the crucial interaction of subject area (e.g., math, science, history), modality (reading, writing, speaking, listening), and expository discourse subtype (e.g., compare/contrast, procedural, cause/effect) because each of these elements can be a contributing factor to a student's difficulty with academic language. Sensitivity to these potential sources of challenge must underpin planning for assessments and interventions that will allow children with language difficulties to achieve academic competence. Figure 1 illustrates these sources of variation and complexity.

Microstructural features (lexical, syntactic) associated with exposition vary across disciplines, increasing the discipline-specific challenges of exposition (Fang, 2012; Fang & Schleppegrell, 2010). Within the three-tier vocabulary model of Beck et al. (2008), even though many disciplines

Figure 1. The complex interactions among modality, expository discourse subtype, and subject area.



share a considerable amount of Tier 2 vocabulary, each discipline also has a unique, technical vocabulary comprising Tier 3 words. In addition to word-level differences, syntactic differences are found across subject areas (Fang, 2006). For example, the specific syntactic features associated with middle school science texts include the frequent omission of relative pronouns (*that, which, who*) and auxiliary verbs (*be*) at the beginning of sentences, resulting in the use of verbs that might be mistaken for the main verb of the sentence (e.g. "Small subpopulations [that are] isolated from the main population have a better chance of diverging than those living within it"; Biggs et al., 2009, p. 438). In addition, nouns and noun phrases are lengthier in some disciplines (e.g., history, science) than in others (e.g., math), creating further heterogeneity across disciplines (Fang, 2012; Fang et al., 2006; Scott & Balthazar, 2010).

Macrostructural features associated with exposition vary across disciplines as well. Certain expository subtypes are more commonly associated with certain disciplines compared with others (Fang, 2012; Ward-Lonergan & Duthie, 2013). For example, history or social studies texts depend heavily on sequencing of events and description of causes and consequences of various actions. In contrast, science texts rely more heavily on compare/contrast and descriptive expository subtypes. Further complexity is added as many texts and passages incorporate not just a single expository subtype but a mix of two or more (Meyer & Poon, 2001). For example, a history text may incorporate a sequential organization of events with a cause/effect explanation. In addition, science texts are more apt to require the integration of information presented in the text with that presented in tables and diagrams, whereas disciplines such as math and history may differentially focus on text or graphic content (Ehren et al., 2012; Fang, 2012).

In summary, expository discourse is an important discourse genre, with distinctive micro- and macrostructural characteristics as well as critically supportive cognitive processes that make it an important focus for SLPs. The particular lexical, syntactic, and organizational properties of exposition are further complicated by the interplay of modality, discourse subtype, and subject area, which each place unique demands on children and adolescents, especially those with language difficulties. Understanding the development of the language and cognitive skills required to meet these challenges surely will play a major role in the development of appropriate clinical methods.

The Development of Expository Discourse

Preschoolers and kindergarteners are able to create simple expository passages (Donovan & Smolkin, 2002), generalize simple learning strategies taught during lessons focusing on specific expository subtypes (e.g., problem/solution or cause/effect; Culatta et al., 2010), and understand that expository passages differ from narrative stories (Donovan & Smolkin, 2002; Duke & Kays, 1998). Nonetheless, these achievements are still quite primitive in comparison with later achievements deemed necessary for academic and vocational success. How do these young children become students who are able to read, write, and discuss complex academic texts? Clues to the nature of this complex process and its relation to expository discourse have only recently begun to surface in a variety of psychological, educational, and communication disorder literatures.

Westby (1985) introduced the idea of an oral-to-literate continuum, wherein children progress from simple speech focusing on concrete, "here and now" topics to later stages where they are able to demonstrate proficiency in abstract, increasingly complex oral and written communication. More recent discussions have emphasized the idea that development along this continuum is dynamic and influenced by both cognitive and linguistic factors (Ehren et al., 2014; Scott, 2005). For example, in the simple view of writing (Berninger et al., 2002, 2010) and the simple view of reading (Gough & Hoover, 1990), an individual's ability to produce or comprehend text is seen as dependent on the interaction of foundational skills (e.g., orthographic skills or word decoding) and cognitive and language abilities (e.g., fluency in production, overall comprehension). The importance of these complex interactions has been reinforced by later studies (e.g., Catts, Adlof, & Weismer, 2006; Catts, Fey, Tomblin, & Zhang, 2002).

The interaction of oral and written language development is supported by findings that show that early language skills predict later reading achievement for children both with and without typical language development (Catts, Fey, Zhang, & Tomblin, 1999; Wise et al., 2007). Receptive vocabulary has been found to predict later reading comprehension (Quinn et al., 2015) over and above expressive vocabulary skills (Wise et al., 2007). Further, receptive vocabulary and reading abilities have been shown to significantly predict writing performance (Dockrell et al., 2007). Through all of these findings, speaking, listening, reading, and writing are seen as developing in a complex, interactive manner. In this section, we provide an abbreviated synopsis of the development of key micro- and macrostructural skill areas supporting expository discourse as well as the general cognitive processes that underlie their development.

Vocabulary and Complex Morphology

Vocabulary development occurs incrementally over time through multiple exposures to a word in meaningful contexts (Dougherty Stahl & Bravo, 2010), with receptive competence generally preceding production (for a review, see Dougherty Stahl & Bravo, 2010). Nagy and Townsend (2012) summarized previous research and estimated that by around the ages of 10 to 12 years, children who are typically developing should be able to demonstrate general proficiency in the use and understanding of an "academic lexicon" (which we can roughly compare to the Tier 2 vocabulary discussed previously). It has been suggested that development of this sophisticated lexicon is especially dependent on exposure, usually in the form of direct instruction (Fang, 2008) and active involvement with the meaning and uses of new words (Beck et al., 2008), though empirical evidence

supporting these claims is lacking. Although explicit instruction may be helpful for oral language, it may be more essential for the development of reading comprehension. As Beck et al. (2008) noted, the comprehension of written text is highly dependent on understanding the lexicon of the passage, which lacks the "richness of clues to meaning" (p. 8) found in the intonation, gestures, and situational context of oral language.

On one hand, systematic, frequent presentation of Tier 2 vocabulary may support growth in a student's academic lexicon, which is then available to help him or her handle a variety of texts and subject areas (Beck et al., 2008; Kinsella, 2013). On the other hand, when fewer expository texts are used in class, the teacher's academic lexicon has been shown to be less diverse and to comprise fewer high-tier vocabulary words (Price, Bradley, & Smith, 2012), thus reducing students' exposure to such words. Studies unfortunately have also shown that exposure to expository texts may differ across schools on the basis of the socioeconomic background of its students (Duke, 2000). Such studies suggest that increased educational attention to exposition—and the complex lexicon associated with it—may benefit a variety of children with typical development, including those at risk for problems in academics and literacy achievement due to socioeconomic factors. However, studies are needed to investigate this relationship more directly.

Complex morphology is attained relatively later than other linguistic skills, with development continuing into adolescence (Nippold & Sun, 2008). In one study, Nippold and Sun (2008) showed that compared with fifth graders, eighth graders could better choose the correct word to complete a sentence for both derived nouns and adjectives (a root word plus a prefix or suffix that transformed the part of speech of a target word into a noun or adjective; e.g., *wrestle+er*, *accept+able*). However, both groups of students demonstrated better performance on sentences with derived adjectives compared with sentences with derived nouns, a finding that is consistent with the suggestion that increased nominalization may add complexity to the processing of expository discourse passages (Fang & Schleppegrell, 2010). Further, Nippold and Sun (2008) hypothesized that morphological development likely continues beyond eighth grade, given that the adolescents they studied did not achieve ceiling scores on this experimental measure. Their study also identified greater success rates with derived nouns and adjectives that occurred more frequently in print, suggesting that increased exposure to these morphologically complex words improves the comprehension and use of such forms (Nippold & Sun, 2008). For SLPs and educators, it is clinically relevant to note that children appear to require exposure to the sophisticated lexicons of exposition if they are to use and comprehend these complicated morphological forms in oral and written discourse.

Syntax

In addition to a maturing lexicon, increasingly complex syntax is needed in order to comprehend and produce expository discourse in oral and, especially, written forms. Donovan and Smolkin (2002) showed that kindergartners were able to demonstrate understanding of basic genre differences between narratives and expository passages, producing simple examples of each genre verbally and in writing. Likewise, Westerveld and Moran (2011) found that 6-year-olds were able to produce oral expository samples in a language sampling task in which they were asked to describe the procedures involved in their favorite game or sport. Yet as children develop more complex thoughts, they require more complex language to communicate those ideas (Nippold, 2010). As a result, increases in syntactic complexity have been found to continue into adulthood and are often exemplified by increases in phrase and sentence length, grammatically correct word sequences, and greater use of subordination (Berman & Verhoeven, 2002; Nippold et al., 2005; Nippold & Sun, 2010).

By the age of 11 or 12 years, students have demonstrated the ability to write sentences typical of more complex expository texts—that is, texts that demonstrate increased syntactic complexity, including up to five or six clauses per sentence (Verhoeven et al., 2002). However, it has been suggested that students usually do not learn to write these complex syntactical forms by reading alone; most children (and many adults) may require explicit instruction and practice (Westby & Clauser, 2005). The nature of the explicit instruction provided may be an important factor affecting the development of these skills. A meta-analysis (Graham & Perin, 2007) examining writing interventions for adolescent students (Grades 4–12) found that grammar instruction (i.e., teaching parts of speech) alone was not an effective strategy for improving writing competence (average weighted effect size = –.32). Sentence-combining instruction, however, where students were taught to combine two or more simpler sentences into a single sentence, had a moderate effect on students' writing (average weighted effect size = .50). Although the CCSS incorporates the introduction of informational texts to children as early as kindergarten, research suggests that many of the complex syntactic skills (e.g., increased subordination) are not regularly incorporated into a student's own oral and written discourse until middle or high school (Nippold et al., 2005; Verhoeven et al., 2002). Future research is needed to clarify what instructional methods may be the most effective in encouraging the growth of complex syntax in children and adolescents.

Discourse Macrostructure

Like the ability to handle microstructural elements of exposition, the ability to produce and comprehend the macrostructural elements (organizational structures) of expository discourse also shows slow, incremental maturation. Using and identifying text-structure clues, such as those shown in Table 2, are skills required for summarization. When summarizing, the reader or listener focuses on the central ideas in a discourse passage and incorporates text-specific structures to identify relationships between these central points and the supporting details (Leopold,

Sumfleth, & Leutner, 2013; Westby et al., 2010). Brown and Day (1983) found that when students in elementary school were asked to read a text and then generate a written summary, they typically used strategies of deleting irrelevant facts but did not show efficient use of other summarization skills (e.g., substitution of superordinate terms for lists of items or actions, selection of a topic sentence). Studies examining summarization development have shown that when students as young as fourth grade are taught explicit text-structure organization, they demonstrate statistically significant improvement in their ability to produce written summaries of expository texts compared with uninstructed students, with effect sizes ranging from small to large depending on topic (Westby et al., 2010).

Summarizing also depends on inferencing abilities (e.g., determining the main idea and using context clues to link newly learned information with previously learned facts) and strategy development (e.g., eliminating irrelevant information and synthesizing ideas to restate in their own words). These skills are needed to create a summary with both local coherence (i.e., sense of consistency and logical connection) between sentences and global coherence that relates the passage to general world knowledge (Catts & Kamhi, 2005; Graesser & Li, 2013). In order to support overall comprehension, skilled readers must integrate higher level summarization and inferencing skills with lower level skills, such as orthographic and phonological processing skills (Helder et al., 2013). As children develop more sophisticated language and cognitive networks, these basic skills become more automatic, enabling them to devote more resources to higher level skills such as inferencing. The skills underlying summarization continue to develop through middle school and into high school and college, when summarization skills are used more effectively (Brown & Day, 1983).

Cognition

The key cognitive skills necessary for production and comprehension of expository discourse (e.g., memory, attention) also continue to develop during adolescence and into early adulthood, as shown by research in neuroscience and neuropsychology focusing on the frontotemporal regions of the brain—key areas known to be responsible for executive functions (Brookshire, Levin, Song, & Zhang, 2004; Horton, Soper, & Reynolds, 2010; Luna, Garver, Urban, Lazar, & Sweeney, 2004). These linguistic and cognitive skills appear to develop in tandem in children and adolescents who are typically developing, allowing these children to handle more complex expository discourse as they progress through school (Montgomery, 2002; Westby & Clauser, 2005). Readers interested in specifics detailing the developmental trajectory of executive functions can see such works as Best and Miller (2010); Huizinga, Dolan, and van der Molen (2006); St. Clair-Thompson and Gathercole (2006); and Westby (2014).

In summary, studies have shown that the complex microstructural (lexical, syntactic), macrostructural (summarizing), and cognitive abilities required to produce or comprehend expository discourse are gradually developing during the school years and continue to develop into early adulthood. Their development depends on an individual's increasing abilities to use background information as well as growing awareness of the special discourse demands presented by different disciplines.

Expository Discourse in Children With LDs

Because of its complexity and protracted development, oral and written expository discourse predictably challenges children with LDs that affect oral and/or written communication, regardless of the specific diagnosis (Catts & Hogan, 2003; Ehren et al., 2014; Moran & Gillon, 2010; Nippold, 2014; Nippold et al., 2008; Scott & Windsor, 2000; Ward-Lonergan et al., 1999). As a consequence, the growing literature on difficulties in expository discourse production and comprehension focuses on children with diagnoses such as specific language impairment (SLI) and language learning disorder as well as the broader category of reading disability. Because of the presumed, focal phonological processing deficit present in dyslexia (e.g., Navas, Ferraz, & Borges, 2014), studies including children with that deficit are excluded from this tutorial in order to focus on children with reading problems associated primarily with vocabulary, grammar, and text-level processing (Catts & Kamhi, 2005). In the section that follows, where findings across these remaining groups are discussed, we use the term *LD* as an expedient cover term (McCauley, Fey, & Gillam, in press).

Language Mechanisms Underlying Expository Discourse Challenges

Vocabulary

As mentioned previously, vocabulary is a key building block for reading and writing (Lee, 2011; Wise et al., 2007). Expository discourse, with its heavy reliance on technical vocabulary, poses significant challenges for students with LD, who have been shown to have smaller vocabularies and poorer ability to access the words they do know compared with their peers who are typically developing (e.g., Coady [2013] for verbal tasks; Mackie & Dockrell [2004] for written tasks). In addition, receptive vocabulary (Dockrell et al., 2007) and expressive vocabulary (Dockrell & Connelly, 2015; Dockrell, Lindsay, & Connelly, 2009) have been found to be predictors of writing proficiency in school-age children and adolescents with LD. Likewise, struggling to identify and understand vocabulary in a written text may interfere with reading fluency and may affect a student's ability to process the main idea of the passage, thus limiting overall comprehension (Adlof & Perfetti, 2014). It has been suggested that for children and adolescents who struggle with the vocabulary composing an oral or written discourse passage, comprehension may suffer when they require more processing capacity to understand key terms, thereby leaving less processing capacity for

comprehension and retention of key facts or integration of several facts into a single main idea (Beck, McKeown, & Kucan, 2013; Fang, 2006).

Syntax

In addition to impoverished lexical knowledge, children with LD tend to produce less syntactically complex oral and written language than children who are typically developing (Dockrell et al., 2007; Mackie & Dockrell, 2004; Scott & Windsor, 2000). Although children with LD can show increases in linguistic complexity when talking about complex topics (e.g., those requiring procedural and problem/solution exposition) compared with general conversation, their ability to produce more complex sentences with greater subordination still lags behind that of children who are typically developing (Nippold et al., 2008; Nippold, Mansfield, Billow, & Tomblin, 2009). In one large longitudinal study, Nippold et al. (2008, 2009) showed that students with a history of language impairment through the eighth and 10th grades demonstrated persistent deficits in their ability to produce spoken sentences with the same complexity as their peers who were typically developing. Children with various LD diagnoses have also been found to produce shorter sentences overall (language learning disorder; Scott & Windsor, 2000) and to show significantly poorer ability to comprehend complex sentences compared with their peers with typical language skills (SLI; Montgomery & Evans, 2009).

Syntactical deficiencies have also been noted in the writing of children with LD. These children have been shown to exhibit reduced grammatical complexity (as measured by words per T-unit; Scott & Windsor, 2000) as well as increased grammatical errors compared with their peers with typical development, especially in sentences with two or more clauses (R. B. Gillam & Johnston, 1992). As yet, it is not completely clear what aspects of (or combination of) complex syntactic elements result in the greatest breakdown in performance for children with LD, as most studies focus only on one syntactic feature (e.g., use of subordination; Scott & Koonce, 2014).

Discourse Macrostructure

Little research has focused on whether and how children with LD differ in their processing of macrostructural features of expository passages compared with children with typical language development. In one study, high-achieving fourth-grade readers demonstrated better abilities than low-achieving students (identified as students with learning difficulties) to monitor comprehension. As a result, the high-achieving students produced more organized summaries (Kinnunen & Vauras, 1995). It has been suggested that students with learning disabilities may struggle to understand the relationships between concepts in an expository passage unless the relationships are explicitly stated (DiCecco & Gleason, 2002). DiCecco and Gleason (2002) found that when students with learning disabilities were taught to use graphic organizers to explicitly identify relationships among facts and concepts, these students included significantly more relational knowledge statements in their written summaries of social studies texts than did students who did not receive this explicit teaching. Together, these studies lend preliminary support to the idea that students who struggle with the language demands of the classroom may struggle with summarization and overall comprehension and may require explicit teaching regarding the organizational structure and relationships expressed within and among different expository passages. However, more work in this area is needed to clarify how students with language difficulties perform given expository passages with different macrostructural organizational schemas (e.g., compare/contrast or cause/effect).

Cognitive Mechanisms Underlying Expository Discourse Challenges

Cognitive challenges of children with LD may also help account for some of the struggles exhibited by these students in challenging expository discourse tasks. Studies in children with SLI have shown key links between language performance and cognitive abilities, especially related to executive functions such as memory and reasoning (e.g., Henry, Messer, & Nash, 2012; Lum, Ullman, & Conti-Ramsden, 2015; Marini, Gentili, Molteni, & Fabbro, 2014). For children with LD, deficits in executive function may affect their ability to produce and comprehend more complicated discourse. Montgomery (2002) synthesized theories of working memory (Baddeley, Gathercole, & Papagno, 1998; Just & Carpenter, 1992) to suggest that deficits in the language processing of children with SLI may be related to impairments in verbal working memory. Montgomery (2002) proposed that the linguistic difficulties seen in comprehension tasks by children with SLI are "the consequence of a complex interaction between the intrinsic capacity of the information processing system of the child, including the verbal working memory system, and the nature of the processing requirements of the task" (p. 85). In support of this idea, Leonard, Deevy, Fey, and Bredin-Oja (2013) found that compared with children who were typically developing, children with SLI demonstrated significantly poorer comprehension for syntactically complex sentences where stimuli varied in cognitive capacity demands (on the basis of the nature of interference from foils competing with the target picture). Leonard et al. reported that, on the basis of the task presented, cognitive capacity appeared to play a larger role than syntactic complexity in the observed difficulties for children with SLI. Thus, the increased difficulties experienced by children with LD on expository discourse tasks—which have been shown to be more cognitively demanding than other discourse tasks (e.g., Baretta, Tomitch, MacNair, Lim, & Waldie, 2009)—may stem from reduced verbal working memory or a poorer ability to inhibit responses in tasks with significant cognitive interference (R. B. Gillam et al., 2002; Kinnunen & Vauras, 1995; Leonard et al., 2013). This idea may help explain why students with LD who experience deficits in executive functions (e.g., working memory, inhibition, shifting attention)

may be particularly susceptible to difficulties in expository discourse production and comprehension (Dockrell, Connelly, Walter, & Critten, 2015; Kendeou, van den Broek, Helder, & Karlsson, 2014; Perfetti, Stafura, & Adlof, 2013).

The ability to identify central ideas and to relate newly learned information to background knowledge also appears to be an area where children and adolescents with LD differ from their typically developing peers. In one study (Miller & Keenan, 2009), despite showing some evidence of recalling central or main ideas more frequently than peripheral ideas, poor readers demonstrated a significantly poorer ability to recall central ideas from a passage relative to good readers, making poor readers more susceptible to associated deficits in summarization and later recall of new information. However, this deficit was lessened if the poor readers had increased background knowledge about the topic on which they were reading. Wynn-Dancy and Gillam (1997) postulated that the combination of reduced background knowledge and deficiencies in working memory makes children with LD especially inefficient in their attempts to retrieve and organize new facts with previously learned ideas. R. B. Gillam et al. (2002) proposed that "central executive mechanisms would appear to be the linchpin of processing between sensory stimuli and higher order cognitive processes and could, in fact, prove to be a critical bottleneck in the information processing systems of children with language impairments" (p. 40). As a result, children and adolescents with LD may experience rapid deterioration in performance with increased task demands that require faster processing, multiple mental steps, activation of prior knowledge, and/or integration of new facts with previously learned knowledge (Cain, 2013; R. B. Gillam et al., 2002).

In summary, children and adolescents with LD may experience a confluence of difficulties in language and cognitive processes that affect their abilities in production and comprehension of expository discourse relative to their peers with typical development. Therefore, professionals who assess, treat, and educate such children need to understand these limitations and how they may affect students' skills with expository discourse tasks in and outside of the classroom.

Clinical and Research Needs

The content presented up to this point was designed to help readers appreciate the complex linguistic and cognitive attainments required to support the development of competent expository discourse skills—receptive and expressive, oral and written, across diverse academic subject areas—even for individuals with typical language development but particularly for those with any condition undermining basic linguistic development or cognitive functioning. Table 3 summarizes all of the expository discourse interventions (including exploratory studies; Fey, 2002) identified in our review. Examination of Table 3 illustrates that the majority of the literature investigating expository discourse interventions has been expert opinion and nonexperimental studies. As a consequence, substantial additional work is needed to produce an evidence base upon which clinicians can identify relevant and valid assessments and effective interventions to use with children who struggle with this complex discourse genre.

The increased use of expository texts at all grade levels associated with the adoption of the CCSS, and the difficulties such texts and passages pose to students with LD, represents a significant challenge for SLPs who are expected to support children and adolescents in their journey to becoming educated, literate citizens. Struggling readers and writers currently may not be receiving targeted interventions focusing on those specific areas of deficit (Fallon & Katz, 2011). In fact, older students, whose language difficulties may be less well understood (Scott, 2014), may often be underidentified, which is particularly concerning given the evidence that continued language, literacy, and cognitive development during this period is critical for academic success (Catts, 2013; Catts et al., 2006). Studies have shown that there are negative long-term emotional, behavioral, and social consequences of persistent academic difficulties or language impairments (Joffe & Black, 2012; Lindsay & Dockrell, 2012), reinforcing the lifelong implications that these difficulties might have for children and adolescents. Thus, we should consider it a priority to provide increased education to SLPs regarding later language development and its relation to disciplinary literacy so that they may more efficiently and effectively assess and treat expository discourse difficulties within the school and clinic environments. Greater understanding will also help provide guidance in assessment and treatment for children and adolescents who may demonstrate difficulties in academic tasks related to expository discourse but may not have conventional developmental language disorders (e.g., students with attention-deficit/hyperactivity disorder or traumatic brain injury).

If SLPs are expected to utilize language sampling in order to assess the expository skills of children and adolescents, as suggested by prominent leaders in the field (e.g., Nippold, 2014; Westby, 2011), evidence-based protocols and analysis techniques need to be developed to make the task more manageable, especially if optimal assessment involves multiple modalities, content areas, and expository subtypes. Very promising steps have been taken already with the development of the Expository Scoring Scheme in the Systematic Analysis of Language Transcripts software (Miller & Iglesius, 2010). In collecting their samples to create this database, Heilmann and Malone (2014) asked elementary school students to describe how to play their favorite game or sport. The use of this particular prompt aligns with prior work on exposition (e.g., Nippold et al., 2005; Westerveld & Moran, 2011) and is consistent both with the idea that choosing a topic of interest to school-age children is important and with academic guidelines for physical education (Heilmann & Malone, 2014). Although the development of the Expository Scoring Scheme database is an important first step, it allows only the analysis of procedural discourse passages, a subtype of expository discourse that may not challenge the language abilities of students enough to show variability that could help in the identification of problems in this area

Table 3. Levels of evidence for intervention studies of expository discourse in children with typical development and language impairments.

Level	Description	References
Ia	Meta-analysis of more than one randomized controlled trial	Graham & Perin (2007)[a]
Ib	Randomized controlled study	DiCecco & Gleason (2002); Gajria & Salvia (1992); Kinnunen & Vauras (1995); Leopold et al. (2013); Meyer & Poon (2001); Wolfe & Mienko (2007)
II	Controlled study without randomization, quasi-experimental study	McKeown et al. (1992); McNamara & Kintsch (1996)
III	Nonexperimental studies (i.e., correlational and case studies)	Culatta et al. (2010); Westby et al. (2010); Wolfe (2005); Wolfe & Woodwyk (2010)
IV	Expert committee report, consensus conference, clinical experience of respected authorities	Hall-Kenyon & Black (2010); Moran & Gillon (2010); Nippold (2010); Scott & Balthazar (2010); Snyder & Caccamise (2010); Ward-Lonergan & Duthie (2013); Westby (2011); Wynn-Dancy & Gillam (1997)

Note. Adapted with permission from the Scottish Intercollegiate Guidelines Network (2014). Adaptations made (May 2015) include collapsing levels IIa and IIb into one level (II).

[a]Includes experimental and quasiexperimental studies.

(Nippold, Mansfield, & Billow, 2007). As shown in at least one study examining complex syntax in children, adolescents, and adults with typical language development (Nippold et al., 2007), a problem/solution expository stimulus elicited responses with greater syntactic complexity than did a procedural discourse task for the three age groups. Because expository discourse encountered in today's classrooms covers many other subtypes and subject areas, researchers should develop similar databases covering additional subtypes of expository discourse to provide valuable information about students who generally are doing well in the classroom as well as norms that can be used to understand children who are struggling academically.

The development of valid assessments for expository skills is further hampered by the relatively rarity of comparisons between groups of students who are typically developing and those with LD (e.g., S. L. Gillam, Fargo, & St. Clair Robertson, 2009; Nippold et al., 2008, 2009; Scott & Windsor, 2000; Ward-Lonergan et al., 1999). Although these studies provide preliminary evidence that differences between groups can be identified, variations in their protocols and the expository subtypes they examined make it difficult for clinicians to draw any firm conclusions without additional research.

Research is also needed to develop evidence-based guidelines for expository discourse interventions targeting difficulties encountered in school-age children and adolescents. Clinicians require a better understanding of what interventions may be most effective given a specific area of difficulty, including guidelines concerning dosage. Methodologically rigorous studies are needed to demonstrate the efficacy and effectiveness of the interventions recommended by leaders in the field, such as sentence combining to promote comprehension and use of complex syntax (Fang, 2008; Scott & Balthazar, 2010).

In conclusion, a strong research base that can support evidence-based practice does not yet exist for guiding clinicians in their efforts to help children and adolescents struggling with expository discourse (Ehren et al., 2012). Researchers, clinicians, and educators must continue to focus on this important topic, especially as we work together to strengthen the academic performance of students who struggle with the "language of the curriculum."

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