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DISCUSSION

Supporting adjective learning by children with Developmental Language Disorder: Enhancing metalinguistic approaches

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Abstract

Background: Adjectives are essential for communication, conceptual development and academic success. However, they are semantically and syntactically complex and can be particularly challenging for children with Developmental Language Disorder (DLD). Surprisingly, language interventions have not typically focused on this important word class.

Aims: (1) To provide a supportive and accessible primer on adjectives for practitioners; (2) to explore how the SHAPE CODING™ system can be adapted to support adjective learning in DLD; and (3) to provide practical recommendations on how to support adjective learning in clinical practice and education.

Methods/Procedure: We synthesise linguistic and psychological research on adjective semantics, clinical insights into DLD and pedagogical practice supporting this population.

Main Contribution: We address the lack of specific training in the nature and acquisition of adjectives for speech and language therapists (SLTs) by providing an accessible primer. We also provide an innovative guide detailing how an established metalinguistic intervention might be adapted to support adjective learning.

Conclusions/Implications: Without targeted support for adjective learning, the communicative potential of children with DLD is compromised. Our recommendations can be used across a range of therapeutic and educational contexts to guide SLTs and teaching staff in developing practice in this area.

KEYWORDS

adjectives, vocabulary, Developmental Language Disorder, language intervention, shape coding

What this paper adds

What is already known on the subject

- Adjectives are an essential word class needed for effective communication. They are also vital to successfully achieve academic objectives across all curriculum areas. For example, most subjects require children to be able to describe, evaluate, compare and discriminate different events, objects or techniques. Children with Developmental Language Disorder (DLD) have deficits in various domains of language that can affect adjective learning and use.

What this paper adds to existing knowledge

- Despite the importance of adjectives, speech and language therapists (SLTs) and other professionals supporting language development rarely receive specific training regarding their structure and meanings, and how to teach and support their use. This article provides an accessible primer on the many subtypes of adjectives and how these behave syntactically and semantically. It explores how adjective teaching could be enhanced for children with DLD by adapting an established metalinguistic technique and provides practical recommendations for implementing this approach.

What are the potential or actual clinical implications of this work?

- By raising awareness of the complexities of adjectives and providing strategies to support their acquisition by children with DLD, this article will enable SLTs and teaching staff to improve their understanding and practice in this area and, with further research, to develop robust, effective interventions for children with DLD. This will contribute to enhancing the long-term academic, social and employment success of children with DLD.

INTRODUCTION

As they acquire language, not only do children need to learn the nouns that label objects in the world around them, they need to learn how to refine these labels and describe these objects by producing and understanding adjectives, for example, *the big one* or *the sock that's pink*. This allows them to specify, evaluate and discriminate between entities by highlighting certain properties. Although adjectives are not usually among the first words in children's productive vocabulary and represent a relatively small percentage of their early lexicons relative to nouns (MacArthur-Bates Communicative Development Inventories: Fenson et al., 2007; Wordbank: Frank et al., 2016), typically developing children master a wide range of adjectives long before they enter formal education around their fifth birthday. A search of seven major North American English corpora of child-produced speech (Child Language Data Exchange System (CHILDES): MacWhinney, 2000) yields over 300 adjective types by age three, the vast majority of which depend on context for interpretation (e.g., big/little, good/bad, hot/cold, hard, funny, pretty, etc.).

Children's emerging skills in descriptive language are essential for academic success. For example, a key target in mathematics at Key Stage 1 (UK Years 1 and 2; 5–7 year-olds) is to describe, compare and sort different shapes, and to compare different quantities such as length, mass, time, and money using appropriate vocabulary (DfE, 2014). In science, children must contrast familiar plants and animals, describe how to identify and group them, and compare different textures, sounds, and smells (DfE, 2014). Similar objectives exist across other subject areas, for example, geography, history, and arts, in which adjectives are used to discuss colour, size, texture and other properties. Children must also incorporate them into longer grammatical structures (i.e., syntax), modify adjectives using suffixes (i.e., morphology), and use them in

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appropriate contexts (i.e., pragmatics). Together, these skills are essential for a wide range of academic skills across a range of subject areas.

However, not all children follow the same developmental path. Adjectives are likely to be challenging for children with DLD due to the wide range of properties they pick out and the restrictions governing which types of words they can combine with (see Table 1). These complexities are rarely taught explicitly. An additional contributor to the challenge is that language interventions and clinical research have tended to focus on nouns or verbs (as noted by Justice et al., 2014 and Ricks & Alt, 2016), with only a handful of interventions targeting adjective learning, for example, Oetting et al. (1995), Leonard et al. (2019), Ebbels et al. (2022), despite adjectives being crucial for opening up the full range of meaning, sophistication in grammar, and access to the curriculum. Compounding this issue, speech and language therapists (SLTs) may not have received specific training in the semantic and syntactic rules governing adjective use. Consequently, practitioners may not be able to model or explain these rules during teaching or intervention.

Considering the importance of adjectives in communicative and conceptual development, the linguistic complexity they present, and their relative rarity in intervention, we argue that adjectives should be specifically targeted in populations that find word learning challenging. To enable practitioners to support adjective development, this article provides an accessible primer on the various types of adjectives and the relationship between their semantics and the syntactic structures in which they appear (Section "Adjective distribution and meaning: A linguistic primer for SLTs"). "Adjective growth in typical development" outlines what is known about the types of adjectives that appear early in typically developing repertoires and those which can be expected to appear later. This provides context for interpreting trajectories in DLD, as well as being useful for practitioners who teach cohorts of variable profiles and abilities. We then review research highlighting the challenges that DLD may present for adjective learning and make the case for greater attention on semantic aspects to benefit adjective learning ("Adjective production and comprehension in Developmental Language Disorder"). Drawing from our primer, we then explore how metalinguistic interventions can be adapted to incorporate the many subtypes of adjectives ("Interventions to support adjective learning"). We focus on how the SHAPE CODING™ system (a widely used strategy for visually capturing language structure; Ebbels, 2007) can be extended to support adjective learning. Finally, we present recommendations for SLTs and teachers introducing adjectives across a range of therapeutic and educational contexts ("Recommendations and conclusions"). In summary, we provide a user-friendly guide to the theory and practice of targeted support for adjective learning, and argue that without this discrete focus, children with DLD may miss out on a crucial aspect of language that not only supports their communication, but is critical for academic success.

ADJECTIVE DISTRIBUTION AND MEANING: A LINGUISTIC PRIMER FOR SLTs

In this section, we present a primer on adjectives: where they are found, what they look like, and what they mean. We first examine the syntax and morphology of adjectives: where do they appear within sentences and what is their internal structure? We then turn to what adjectives mean, focusing on four main features of adjective semantics: GRADABILITY, ENDURANCE, SUBJECTIVITY, and ANIMACY, and looking at how adjectives can form SEMANTIC DOMAINS (groups of lexically related items).

Throughout this section, we show that the syntax and semantics of adjectives are closely related. The position (or distribution) of adjectives relative to other words in a sentence, and the kinds of words they can or cannot occur with tells us a lot about their meaning. For example, if an adjective can be modified using *very* (e.g., *big*), it expresses a gradable property, or hearing that something *tastes delicious* or *looks pretty* reflects how the property described by the adjective is perceived. The corollary is that adjectives' meaning constrains their distribution (something cannot be *very extinct* or *taste open*). When acquiring language, children can track the linguistic environments in which words appear and use this distributional information to deduce word meaning. The phenomenon of using syntax to learn meaning is known as 'syntactic bootstrapping' (Gleitman, 1990) or 'structure mapping' (Fisher, 2002).[1] If educational or clinical interventions could use this two-way link between syntax and semantics, and the semantic/conceptual restrictions on co-occurrence, this could be an additional route to equipping children with the knowledge they need for communicative success.

Where do adjectives appear?

Adjectives appear alongside articles like *a* or *the*, quantifiers like *every*, and numerical expressions like *two*. They also appear immediately next to the noun they modify. Most adjectives in English can appear in both prenominal position (before nouns: 1a), and in predicative position (after a copular or a linking verb: 1b).

(1) a. That is a {**tall, strong, impressive**} gymnast.

b. That gymnast {is, appears} {**tall, strong, impressive**}.

While most adjectives appear in both positions, there are exceptions (see 2a, where '*' indicates an ungrammatical sentence). Note that adjectives with similar meanings (2b) can usually appear in either slot.

(2) a. The child is {**asleep, afraid**} versus *The {**asleep**, **afraid**} child.
b. The child is {**sleeping**, **frightened**}, The {**sleeping**, **frightened**} child.

Finally, adjectives can also be stacked: all of the adjectives in (1b) can appear together before the noun as in (1a), in a certain order (Scott, 2002).

The order that adjectives and nouns appear in varies across languages. For example, in English, adjectives primarily appear before the noun, but in French they mostly appear after it. In many languages, there is also morphosyntactic agreement between the adjective and noun. For example, in Romance languages like French and Spanish, they must agree in number and grammatical gender, for example, *une chemise bleue* (a blue shirt, feminine, singular) versus *les chemises bleues* (feminine, plural) versus *un chapeau bleu* (a blue hat, masculine, singular).

Many adjectives allow speakers to make comparisons by placing them in DEGREE CONSTRUCTIONS, where they are accompanied by additional morphology, such as the comparative, superlative, and equative in (3), respectively.

(3) a. She is {**tall**er, more **clever**} than her sister.
b. She is the {**tall**est, most **clever**} in her class.
c. She is as {**tall, clever**} as her brother.

There are some common exceptions to these regular comparatives, for example, *good, better,* and *best.*

Many 'how' questions are also degree constructions, since they measure amounts or quantities of a property. When adjectives appear in such questions, they commonly appear before the copular verb (4a), in contrast to (4b), which elicits a description.

(4) a. How {**big, long, heavy**} is it?
b. How does it {feel, taste}?/What does it {feel, taste} like?

What forms do adjectives take?

As well as appearing in their root form (e.g., *big, quick*), adjectives occur with morphological affixes, for example, *-er*, *-ly*. Like nouns and verbs, adjectives take on INFLECTIONAL and DERIVATIONAL MORPHOLOGY. Regarding inflectional morphology, English adjectives frequently appear with the comparative morpheme *-er* and the superlative morpheme *-est* to transform the root to a form that explicitly compares properties, while retaining adjective status. Adjectives also take on derivational morphology that transforms them into adverbs (e.g., *slowly*, *quickly*) or verbs (e.g., *lighten*). Other adjectives have already been formed from other grammatical categories like nouns (e.g., *spotted*, *bumpy*) or verbs, as shown with the adjectival passives in (5) and (6).

(5) a. The lecture bored the girl. (verb, past tense)
b. The girl is **bored**. (adjectival passive)
(6) a. The tree broke the window. (verb, irregular past tense)
b. The window was **broken** (by the tree). (adjectival passive)

Still in other cases, a word can be lexically ambiguous, for example, *clean*, *dry*, *wet*, functioning as verbs as well as adjectives, disambiguated by the discourse context.

What do adjectives mean?

Saying that adjectives *describe* does not do justice to the range of adjective meanings children must acquire. Here, we focus on some of the main features of adjective meaning cued by syntax: GRADABILITY, TEMPORAL ENDURANCE/GENERALISABILITY, SUBJECTIVITY and ANIMACY. As with the surface-level distributions discussed in the section "Where do adjectives appear?", these features produce distinct semantic domains. These subtypes of adjectives, along with some examples and surface-level patterns that highlight the distinctions, are summarised in Table 1.

Gradability

Gradability is a core distinction among adjective meanings that is reflected in the syntax. Gradable adjectives (GAs) convey measurable properties and encode degrees or extents in their semantic representation, licensing them to appear in degree constructions as shown in (7).

(7) a. This pine tree is {**tall, old**}.
b. This pine tree is {**taller, older**} **than** that juniper tree.

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TABLE 1 Types of adjectives discussed in this paper (NB. '*' indicates an ungrammatical sentence)

Adjective category	Examples	Characteristics
Gradable	(see subtypes below)	Appearance in degree constructions: - *is ADJer than/is ADJest* - *is very/so/extremely/really/too ADJ* - *is ADJ enough* - *is as ADJ as*
Relative	*Tall, big, long, expensive*	Appearance with for-phrases - *tall for a preschooler* Restrictions on adverbial modification: - **slightly big* - **half big* - **completely big*
Absolute minimal	*Bumpy, spotted, fluffy*	Restrictions on adverbial modification: - *slightly bumpy* - *half spotted/spotted all over* - *?completely bumpy*
Absolute maximal	*Full, healthy*	Restrictions on adverbial modification: - **slightly full* - *completely full*
Non-gradable	*Wooden, plastic, extinct, coniferous*	Absence in degree constructions: - **is very wooden* - **is more plastic than/too plastic* - **is as extinct as*
Temporary	*Frustrated, happy, sleepy*	Flexible adverbial modification: - *is currently frustrated* - *was happy yesterday* No generalisation within kind: - *if one labrador is sleepy, no guarantee another will be too*
Durative/enduring	*Intelligent, British, friendly*	Restrictions on adverbial modification: - **is currently intelligent/British* - **was intelligent/British yesterday* Generalisation within kind: - *if one labrador is friendly, another might be too*
Subjective	*Strong, good, fascinating, difficult*	Flexible meaning depending on accompanying noun: - *Strong for a 7-year-old*

c. This oak tree is {**as tall as** that pine tree; **too old to** uproot}.

Other adjectives are not gradable: either the entity possesses the property or it does not. As a result, non-GAs are not licensed in degree constructions as shown in (8).

(8) a. This tree is {**coniferous, deciduous**}.
b. *This tree is more {**coniferous, deciduous, living**} than that tree.
c. *This tree is as {**coniferous, deciduous, living**} as that tree.
d. *This tree is too {**coniferous, deciduous, living**}.

As shown in Table 1, there are three main kinds of GAs, each with restrictions on modifiers they can combine with. First, **relative GAs** are defined relative to a contextually set standard of comparison. This standard is often expressed using a 'for' phrase (see 9).

(9) a. She is **tall** for a gymnast.
b. That's **expensive** for a latte.

On the other hand, **absolute minimal GAs** like *bumpy* or *dirty* are true when an object has some minimal presence of a property, like some number of bumps or amount of dirt. **Absolute maximal GAs** like *full/empty* or *healthy* encode a maximal endpoint.

The different types of GAs can be highlighted using comparatives. While (10–12a) may all be true, only the inference in (10b) is licensed.

(10) a. This road is **bumpier** than that one. (absolute minimal GA)

b. ⇻ This road is **bumpy**.

(11) a. This child is {**taller, older**} than that child. (relative GA)
b. ⇻ This child is {**tall, old**}.

(12) a. This bottle is {**fuller, cleaner**} than that bottle. (absolute maximal GA)
b. ⇻ This bottle is {**full, clean**}.

Adverbial modification of GAs also reveals these distinctions, due to the selectional restrictions of adverbs (Kennedy & McNally, 2005). An intensifying adverb such as *very* (or *really* or *extremely*) can appear with a wide range of adjectives, as shown in (13).

(13) a. The container is very **tall**. (relative GA)
b. The container is very **full**. (absolute maximal GA)
c. The container is very **dirty**. (absolute minimal GA)

Toddlers can recruit the presence of these modifiers and the restrictions they encode in adjective learning (Syrett & Lidz, 2010).

Since absolute minimal GAs like *dirty* denote the existence of a property, they can be modified by *slightly* or *somewhat*. The same adverbs sound odd with relative GAs like *tall*, or absolute maximal GAs like *full*, as shown in (14).

(14) a. The container is slightly **dirty**. (absolute minimal GA)
b. *The container is slightly **tall**. (relative GA)
c. *The container is slightly **full**. (absolute maximal GA)

Finally, an adverb such as *completely* (or *entirely* or *half*) can modify an absolute maximal GA that has a fixed end point, but not one like *tall*, as shown in (15).

(15) a. The container is completely **full**. (absolute maximal GA)
b. *The container is completely **tall**. (relative GA)
c. ?The container is completely **dirty**. (absolute minimal GA)

Temporal endurance

Some adjectives encode specific time properties in their semantics. Some of these properties are temporary, as in (16a), while others express properties that are enduring, as in (16b). These endurance properties dictate whether certain adjectives can combine with certain adverbial modifiers.

(16) a. The toddler {is (currently) **sleepy** (right now)/was **sleepy** yesterday}.
b. *Her father {is (currently) **British** (right now)/was **British** yesterday}.

Endurance also affects the extent to which we can generalise about other examples of a kind. For example, knowing that a dog from a particular breed is *friendly* or *loyal* (enduring properties) might invite an inference that others of the same breed are as well. However, knowing that the same dog is *sleepy* or *hungry* (temporary properties) does not trigger the same generalisation about others.

Subjectivity

Some relative GAs express a speaker's subjective view about something:

(17) a. {I think} this casserole is **delicious**.
b. This game is **fun** {for the whole family, for children}.

This subjectivity is illustrated in dialogue (18). Two speakers can make statements with apparently opposite truth values, though both can be asserting something true (this is known as 'faultless disagreement').

(18) A: This game is **fun**!
B: No, this game is not **fun.** It's **boring**!

Subjective adjectives often allow a 'for' phrase to express an agent's position relative to an event, further specified by the optional infinitival 'to' phrase (19) (Becker, 2017).

(19) This game is {**tough, fun**} (for him) (to play).

The meaning of a word that appears alongside a subjective adjective can tell us more about the adjective's meaning. For example, there are times when the noun that an adjective modifies actually specifies the meaning of the adjective, because the adjective itself is indeterminate, as in (20a). What counts as being 'good' or 'talented' at these professions varies wildly. For this reason, these adjectives can also be followed by a 'for' phrase featuring these nouns.

(20) a. She is a {**good, talented**} {dancer, butcher, accountant, pilot}.

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b. She is {**good, talented**} for a {dancer, butcher, accountant, pilot}.
c. She is {**tall, clever**} for a 7-year-old.

Animacy

The adjectives appearing in (21a) denote emotions or dispositions, and therefore can only be true of animate (or anthropomorphised) beings, making (21b) sound odd.[2] A learner must first know whether or not the entity referred to by the noun or pronoun is animate to know which adjectives can combine with it.

(21) a. She is (feeling) very {**sad, happy, tired**}.
b. #This chair is (feeling) very {**sad, happy, tired**}.

Knowledge about a subject's animacy could therefore help a learner work out the meaning of a novel adjective (Shablack et al., 2019). Animacy restrictions can also help when learning new nouns. A learner might not know what a 'dax' is in (22), but they could tell it is animate from the accompanying adjectives (Ferguson et al., 2014; Syrett et al., 2019).

(22) The dax is very {**sad, tired**}.

Semantic domains

Similarities in distribution and meaning allow adjectives that pattern similarly to form semantic networks or domains (Clark, 2018). Adjectives with similar meanings (synonyms) for example, *big, large, huge*, are linked together, but those with opposite meanings (antonyms) for example, *long, short,* are also related because they share similarities at their core, for example, extension along the dimension of length. Caregivers may provide surface-level cues about inferences related to these meanings via discourse connectives, as shown in (23).

(23) a. She is **small**, but she is **strong**.
b. She is **smart**, if not **brilliant**.

Adjective distribution and meaning: Relevance for clinical practice

While some of the points that describe the forms and functions of adjectives may already be familiar, others may be new to practitioners who have not been trained in theoretical linguistics and may present novel opportunities for clinical practice or Continuing Professional Development (CPD). We summarise these key linguistic points below. See also Table 1 for examples.

1. An adjective's **position in a sentence and the words it can co-occur with** tells us something about its meaning. Likewise, its meaning gives clues about where it can appear in a sentence and what it can combine with. Highlighting this bidirectional relationship may increase children's confidence with adjectives.
2. Adjectives can be **non-gradable** (where a property is present or it is not) or **gradable** (where a property can hold to a greater or lesser extent). GAs can be **relative** (where the adjective and property rely on a norm or standard, like *big* or *funny*), or **absolute** (where the adjective depends upon the presence or absence of a property, like *dirty* or *clean*). These different adjective types combine with different modifiers. As with point 1, making this modifier–adjective relationship explicit can provide extra clues about the type of adjective under study.
3. Some adjectives are **subjective** and speaker-dependent, allowing contradictions to exist in dialogue, for example, a drink can be both *delicious* and *disgusting* to different people. Highlighting the fact that speakers can have different views while still telling the truth can help children understand that some adjectives can be speaker-dependent and that an object and its property are sometimes separable.
4. Some adjectives express **temporary** properties (e.g., *sleepy*) and others express more **permanent** states (e.g., *introverted*). Temporal endurance also triggers inferences about the generalisability of adjectives to other members of the same class that possess that property. Highlighting each of these aspects can support children's conceptual development. As in point 2, highlighting that only certain adverbial modifiers can be used with temporary adjectives may scaffold children's understanding of which adjectives refer to transient properties.
5. Some adjectives (e.g., *happy, hungry*) can be true only of **animate** beings, and restrict the range of nouns they modify. Making this constraint explicit may help children deduce the meaning of both novel adjectives and novel nouns.

ADJECTIVE GROWTH IN TYPICAL DEVELOPMENT

As children's productive and receptive vocabularies develop beyond the first words, the number of nouns in their repertoires dwarves every other category, including

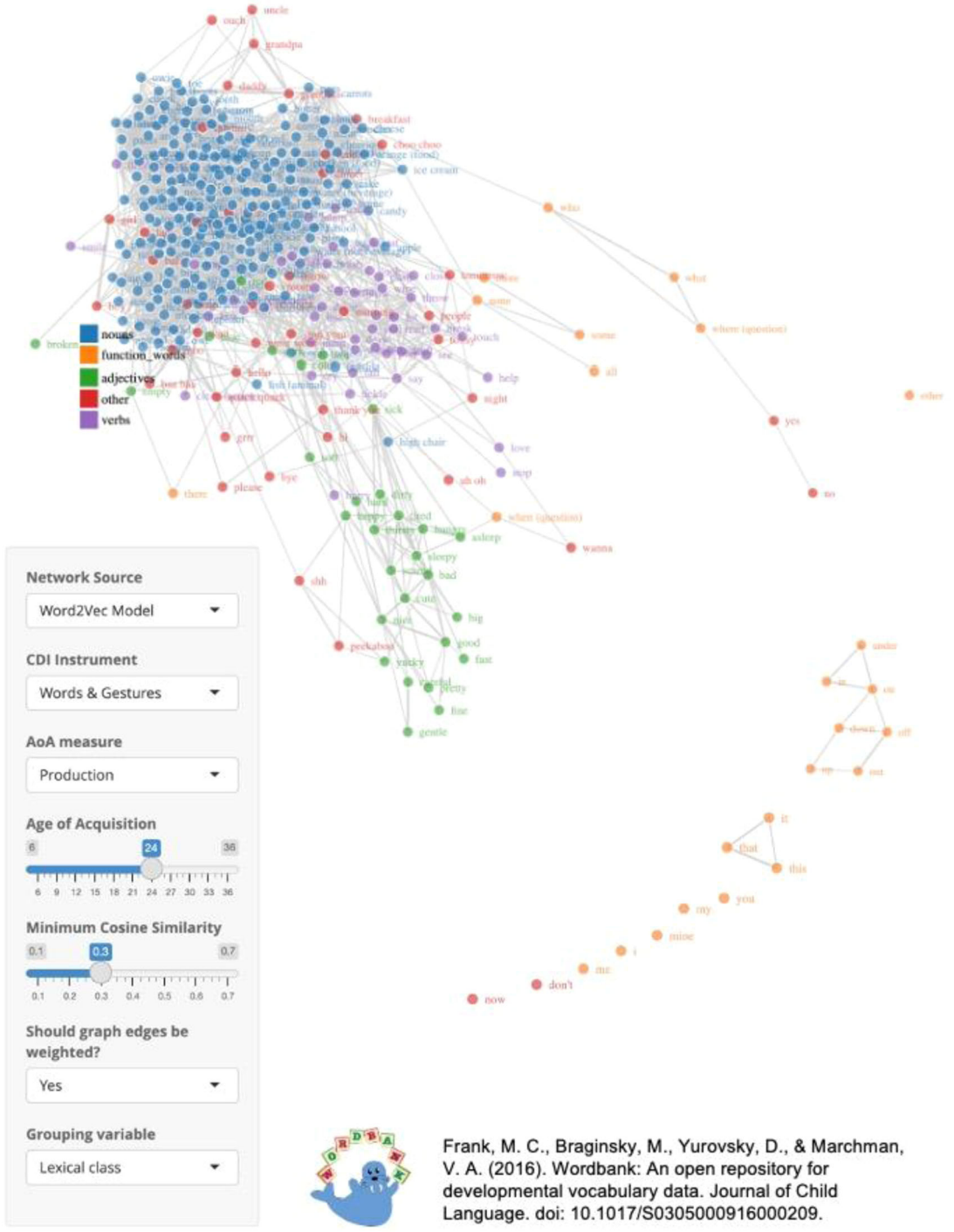

FIGURE 1 Semantic network illustrating word categories produced at 24 months of age (MacArthur-Bates Communicative Development Inventories (CDI)) [Colour figure can be viewed at wileyonlinelibrary.com]

verbs and adjectives (Gentner, 1982; see also Figure 1). By two and a half years of age, when the typically developing child produces over 600 words, nouns represent 40%–50% of their repertoire, while adjectives represent approximately 10% (Fenson et al., 1994). However, by three years of age, children produce and comprehend a wide range of adjectives. An extensive search of transcripts of child speech in English reveals adjectives denoting size (*big, little, wee*), others related to gradable, physical properties (*heavy*, *hot*, *hard*, *wet*), colour (*red, blue*), subjective perspective (*good*, *funny*, *pretty, nice*, *cute*), among others (CHILDES: MacWhinney, 2000). A semantic network generated in Wordbank captures this visually (Frank et al., 2016; see Figure 1). These same adjectives are also reflected

in the ambient language and child-directed speech (Davies et al., 2020).

While children's production is fairly consistent with the frequency of these items in the speech they hear, explaining some of the sequence of adjective acquisition, it is also the case that children benefit from the environments in which adjectives appear, taking advantage of contrastive focus between polar terms (*is this water hot or cold?*), syntactic frames in which adjectives appear (*are you as tall as Mommy?, you're a big boy to read that, it might be a little too large to go on there, it won't be difficult to get it out*), and adverbial modifiers (*you're making him all wet, busses are usually pretty clean, I'm very sleepy, that's very good*) to learn the meaning of adjectives and distinctions within this grammatical category. Those adjectives that are learned later are more abstract, infrequent, phonologically or morphologically complex, and impose more restrictions on the environments in which they appear.

ADJECTIVE PRODUCTION AND COMPREHENSION IN DEVELOPMENTAL LANGUAGE DISORDER

This section briefly reviews research investigating the challenges that children with DLD experience in morphology, syntax and word learning. Abilities in each of these domains are likely to affect their understanding and use of adjectives, and so we extrapolate from this relationship to inform our understanding of adjective use and intervention in DLD, which is very much in its infancy. Due to space constraints, we focus on surface manifestations of DLD across these linguistic domains. For key theoretical explanations of DLD, see for example, Leonard et al. (1997), Rice et al. (1995) and Ullman & Pierpont (2005).

DLD has been defined as a language impairment that affects everyday life but is not associated with a known biomedical condition (Bishop et al., 2017). Children with DLD tend to show impairments in various domains of language including vocabulary and morphosyntax. As a consequence, these children may struggle to achieve academic objectives. Longer-term, DLD-related language difficulties can persist into adulthood, affecting academic and professional development (Conti-Ramsden et al., 2018).

Morphology in DLD

Morphological deficits (i.e., challenges with the internal structure of words such as word stems and affixes) are pervasive in DLD (Leonard & Deevy, 2020). In English, children with DLD tend to show errors of omission and commission when producing inflectional morphology such as past tense (*-ed*), third person singular (*-s*), and possessive (*'s*) (e.g., Bishop, 2014; Calder et al., 2021). These problems extend to adjective-noun agreement in gender and number (Bedore & Leonard, 2001; Leonard et al., 2001). For example, French-speaking children with DLD show more gender agreement errors in picture descriptions compared to their age-matched peers, for example, *la grenouille(f) vert(m)* (the frog(f) green(m)) (Royle & Reising, 2019).

Children with DLD produce more stem truncation errors (e.g., *tider, heavest*) when producing comparative (e.g., *tidier*) and superlative (e.g., *heaviest*) adjectives, and show more errors (e.g., *rocksy* instead of *rocky*) when producing adjectives with derivational morphology than their language-matched, typically developing peers (Marshall & van der Lely, 2007). They also tend to produce fewer comparatives and adverbial modifiers (e.g., *extremely, quite*) than age-matched, typically developing children (Tribushinina & Dubinkina, 2012). When asked to produce antonyms, Russian-speaking children with DLD gave more irrelevant answers (e.g., *big – with flowers*), produced more negations using 'not' rather than an antonym (e.g., *empty – not empty*), and more gender agreement errors than age-matched, typically developing children (Tribushinina & Dubinkina, 2012).

Syntax in DLD

Children with DLD are challenged by a range of syntactic constructions. While many children with DLD can comprehend and use sentences with a simple subject-verb-object order, sentences containing more complex structures such as modified noun phrases can cause communication breakdowns (Gillam et al., 2019). For example, children with DLD are less likely to produce complement clauses (Owen Van Horne and Lin, 2011), adverbial modifiers, and relative and coordinate clauses, which often incorporate adjectives (Marinellie, 2004), for example, *the cow that's big*. There is also evidence that they have difficulties using syntactic bootstrapping to support inferences regarding the meanings of new words (van der Lely, 1994; O'Hara & Johnston, 1997).

Vocabulary in DLD

Word learning can be particularly problematic for people with DLD. They have difficulties learning, retaining and using vocabulary (Gray, 2005; Kan & Windsor, 2010; McGregor et al., 2020) and thus tend to have smaller vocabularies (Leonard & Deevy, 2020) and a shallower understanding of the words they know (McGregor et al.,

2013). When learning new words, they need a higher number of exposures to the novel label and its referent (Rice et al., 1994; Storkel et al., 2019), meaning that they may learn words more slowly than their typically developing peers. Children with DLD are less able to derive new word meanings from context (McKeown et al., 1985, Cain et al., 2004), perhaps in part due to their syntactic bootstrapping difficulties. They also show disproportionate difficulties identifying visual properties such as colour, pattern or shape, especially when the visual information has to be processed in parallel with language (Alt & Plante, 2006). Thus, children with DLD are likely to need focused teaching of vocabulary, with multiple presentations and spaced retrieval practice with feedback distributed over several days or weeks. Indeed, studies have shown that such approaches support the learning and retention of new vocabulary in children with DLD (e.g., Gray, 2005; Haebig et al., 2019; Leonard et al., 2019; Riches et al., 2005; Storkel et al., 2017, 2019; Zens et al., 2009).

Implications for adjective learning, use and intervention in DLD

The wide-ranging difficulties exhibited by children with DLD with morphosyntax, semantics and word learning are likely to affect their learning of adjectives and ability to use them in grammatically accurate sentences, particularly given the complex nature of adjective semantics and their relationship with syntax and morphology. However, very few studies have investigated the ability of children with DLD to learn adjective meanings and use them accurately in sentences.

One study which taught novel adjective meanings and forms with multiple presentations and repeated spaced retrieval (Leonard et al., 2019), showed no significant difference between children with DLD and typically developing (TD) children, although the children with DLD derived more benefit from the repeated spaced retrieval than the TD children. Thus, it is likely that when this support is not provided, children with DLD might find adjective learning difficult. Another study (Oetting et al., 1995) indicated that young children with DLD may find adjective meaning harder to learn than noun meaning. Neither of these studies considered the use of adjectives in sentences. However, a recent intervention study with young adults with DLD and low vocabulary levels (aged 16–19 years, Ebbels et al., 2022), taught college-course-specific vocabulary and found a significantly greater effect of 1:1 SLT intervention over hearing new words in lessons. This intervention effect was similar for nouns, verbs and adjectives, and improved their ability to recognise and produce a definition and to use the words accurately in a sentence. This study did not compare the abilities of the young adults with DLD to TD controls and thus we do not know whether their response to intervention (or indeed hearing words in lessons) was different from TD young people.

Interim summary

A large body of research on DLD focuses on children's lexical and morphosyntactic abilities, providing useful theoretical and practical insights into their use of adjectives. In addition to solid skills in these domains, good semantic skills are required to fully understand the meaning of adjectives and to use them appropriately, for example, to correctly make comparisons or use adverbial modifiers (as shown in the section "Adjective distribution and meaning: A linguistic primer for SLTs"). Much less attention has been given to how children with DLD manage this aspect of vocabulary. In the section "Adjective production and comprehension in Developmental Language Disorder", we described some of the difficulties that children with DLD have with morphology, syntax and word learning, and how these may affect adjective learning and use. Given the complex nature of adjective semantics and the ways that it interfaces with syntax, plus the difficulties that children with DLD have in these domains, there is a significant need for research into how children with DLD understand and use adjectives in sentences, and the specific challenges they may face, both without and with intervention. Without such investigations, our understanding of language learning in DLD and how best to support it remains limited.

INTERVENTIONS TO SUPPORT ADJECTIVE LEARNING

Despite the lack of intervention studies solely focusing on adjectives, the properties represented by adjectives (e.g., colours, size, emotions) are often targeted in education and clinical practice, including as part of vocabulary interventions (e.g., Parsons et al., 2005; St. John & Vance, 2014). In many approaches, adjectives are presented as a way of facilitating children's knowledge of nouns, for example, using prompt questions such as "what does it look like?", but are not targeted explicitly as a word class in their own right. This implicit reliance on adjectives further emphasises the need for a firm understanding of adjectives by children with DLD.

Certain fundamental principles are key to the development of adjective skills. As the section "Adjective distribution and meaning: A linguistic primer for SLTs"

demonstrates, children need to know where adjectives appear in sentences, what kinds of meanings they convey, how they relate to other words – both other adjectives (e.g., synonyms and antonyms) and also to those linked via inflectional and derivational morphology, for example, *noise → noisy, create → creative, frighten → frightening/frightened*. They also need to understand not only the general features and processes that apply to all adjectives, but also those that are restricted to specific subtypes of adjectives.

We structure this section by considering first the general information that children need to know about adjectives: where they can appear (cf. "Where do adjectives appear?") and how they are formed (cf. "What forms do adjectives take?"). We then discuss how we might teach adjective semantics, incorporating the linguistic features discussed in "What do adjectives mean?". Drawing on our combined theoretical, therapeutic and pedagogical expertise, we describe how the SHAPE CODING system (Ebbels, 2007), a metalinguistic intervention, can be adapted to support adjective learning in children with DLD. We clarify which of these new approaches have been trialled in clinical practice and which are yet to be tried (noting that even those that have been trialled have not yet been fully evaluated in a research study). Our next steps are to trial and assess these ideas with children with DLD, adjusting them according to their response. We encourage clinicians to join us in these efforts and to share their results.

Teaching children with DLD where adjectives appear

Children need to know where adjectives appear for both expressive and receptive purposes, that is, so they can describe and specify objects, and so they can identify adjectives in sentences. As for all unfamiliar words, they need to be able to form hypotheses about a word's meaning, drawing on its position in the sentence (to work out its word class and to enable syntactic bootstrapping), the context (discourse, physical and visual), and its inflectional and derivational morphology.

Given the difficulties children with DLD have with many areas of language discussed in "Adjective production and comprehension in Developmental Language Disorder", and the potential implications for adjective learning and use ("Implications for adjective learning, use and intervention in DLD"), they may need to be explicitly taught the rules governing where adjectives can appear within sentences, the limitations on which adjectives (with which semantic features) can appear in which structures, and how these limitations can be informative about adjective meanings and use (cf. "Where do adjectives appear?").

FIGURE 2 Questions, shape and colour for adjectives [Colour figure can be viewed at wileyonlinelibrary.com]

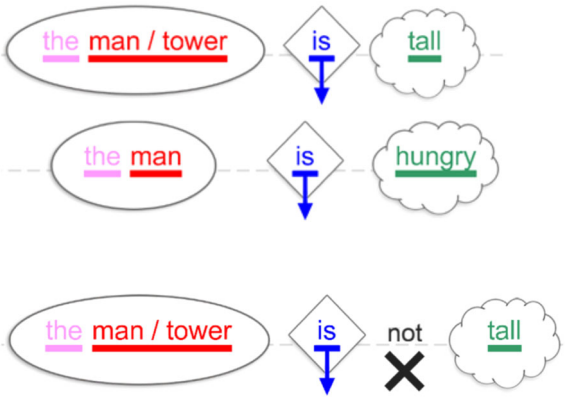

FIGURE 3 Sentence templates for adjectives following copular verb [Colour figure can be viewed at wileyonlinelibrary.com]

The SHAPE CODING system (Ebbels, 2007) is an explicit metalinguistic approach to intervention that uses shapes, colours, lines and arrows to depict and teach the rules of grammar (see also Balthazar et al., 2020 for an updated introduction). This system helps children to literally see the rules, thus enabling an adult to explain complex grammatical rules in an accessible way with minimal use of language. The SHAPE CODING system has been used successfully with children with DLD to enhance their understanding and production of a range of constructions including production of verb argument structure (Ebbels et al., 2007), comprehension of coordinating conjunctions within noun, verb and adjective phrases (Ebbels et al., 2014), and use of regular past tense (e.g., Calder et al., 2021).

In the SHAPE CODING system, adjectives are coded as 'green words' that appear in clouds and answer questions of 'WHAT (look/sound/smell/taste) LIKE?' and (for animate subjects) 'HOW FEEL?' (see Figure 2).

Children with DLD are taught the positions in which adjectives can appear. The first position that we teach is after the copular verb (diamond), where the cloud describes properties of the external argument (oval) – answering WHO or WHAT (see Figure 3). This is usually the subject of the sentence. The adjective thus describes either WHAT it is LIKE, or (if animate) HOW it FEELS. We also teach how to negate using *not* after the diamond.

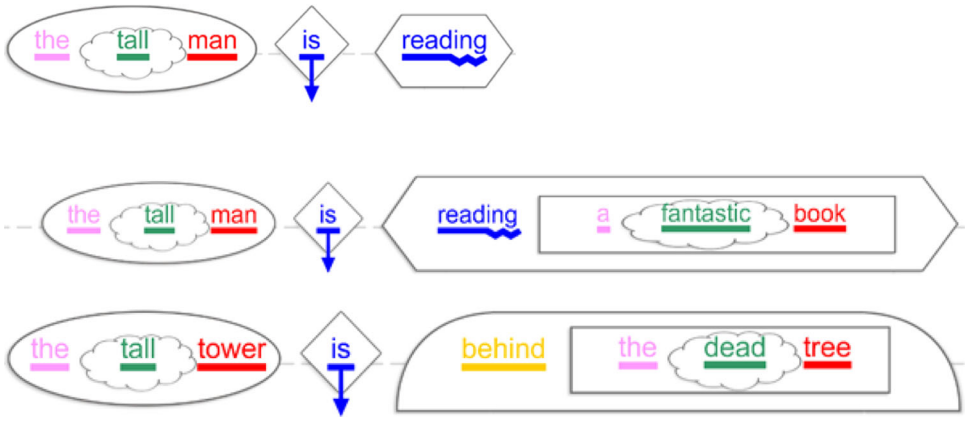

FIGURE 4 Sentence templates showing adjectives within noun phrases [Colour figure can be viewed at wileyonlinelibrary.com]

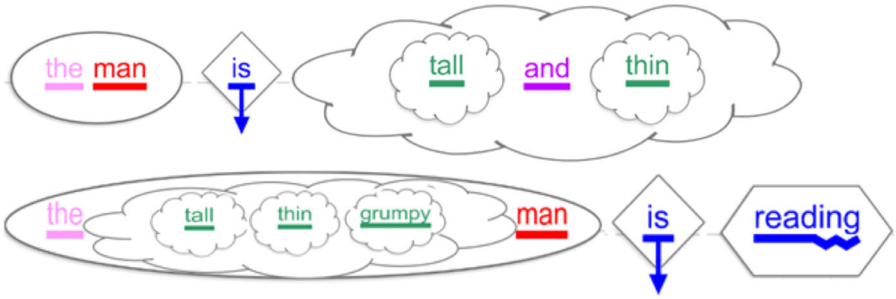

FIGURE 5 Sentence templates including coordination and stacking of adjectives [Colour figure can be viewed at wileyonlinelibrary.com]

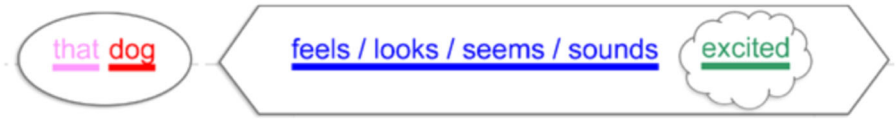

FIGURE 6 Sentence template with adjective appearing after perception verbs [Colour figure can be viewed at wileyonlinelibrary.com]

Next, we teach that adjectives can appear inside noun phrases (see Figure 4), whether this is an external (oval) or internal argument (rectangle). In English this is between the determiner (in pink) and noun (in red).

Coordination and stacking of adjectives might be taught as part of this step, where only identical shapes can be coordinated (see Figure 5).

Next, we might introduce adjectives after perception verbs (see Figure 6), or in degree constructions (Figure 7).

As explained in "Gradability", degree constructions can only be used with GAs, so we would discuss with the child which adjectives have the required semantic properties (see "Teaching children with DLD what adjectives mean, how they are related to each other, and their links with syntax"). Degree constructions often answer a question about HOW + ADJ (e.g., *how tall*) an object is. To show that the HOW in this case is asking about degree, we have added vertical lines to a black underline to indicate measurement (this could be thought of as a ruler or callipers). The degree modifiers are then marked with the same symbol (see Figure 7). This is a new addition to the SHAPE CODING system and has not been trialled in clinical practice.

The last two examples in Figure 7 often appear in structures such as those in (24a) and (25a), as the *too* and *not enough* express the degree relative to an agent and/or activity. Such structures can be very complex. Indeed, in (24a) *the tree* is both the subject of the main clause and the (unexpressed) object of the embedded clause. Thus, while these structures might be useful for typically developing children, they are likely to be too syntactically complex to be helpful for children with DLD. Therefore, we recommend that in order to provide the same information in a

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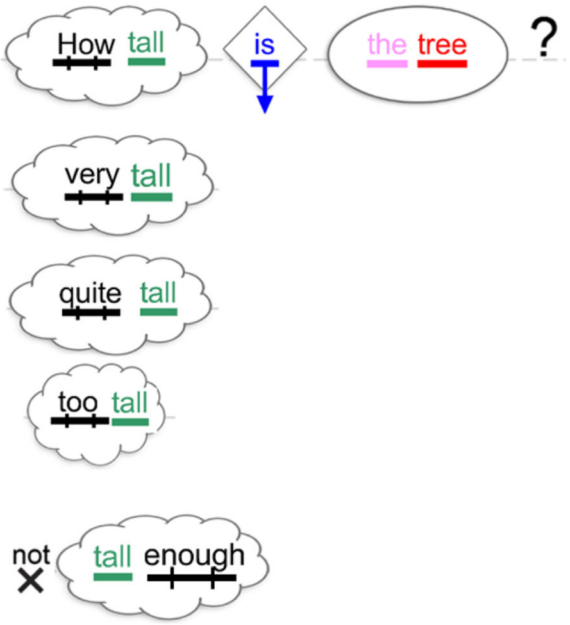

FIGURE 7 Coding of degree constructions and questions involving "how ADJ?" [Colour figure can be viewed at wileyonlinelibrary.com]

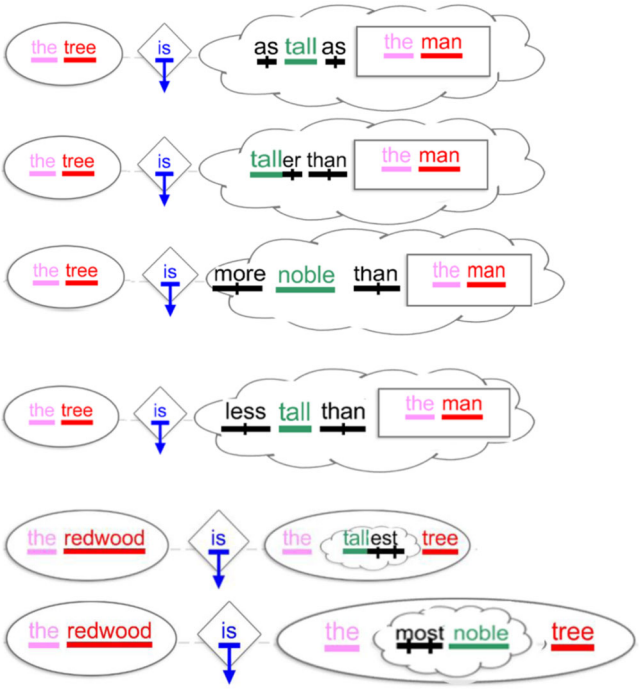

FIGURE 8 Sentence templates and coding for equative and comparative constructions [Colour figure can be viewed at wileyonlinelibrary.com]

less complex form, such sentences should be simplified, for example to (24b) and (25b), or even further to those in (24c) and (25c).

(24) a. *The tree is too tall for the boy to climb.*
b. *The boy wants to climb the tree, but the tree is too tall.*
c. *The boy (is sad. He) can't climb the tree. The tree is too tall.*

(25) a. *The boy is not tall enough to reach the sweets.*
b. *The boy wants to get the sweets, but he is not tall enough.*
c. *The boy wants the sweets. He can't get the sweets. He is not tall enough.*

For equatives (e.g., *the tree is as tall as the man*) and comparatives, we split the black measurement symbol between {*as…as; -er…than; more/less …than*} (Figure 8). This allows us to show the children why ***more** tall**er than*** would be incorrect as there are too many degree markers (three instead of two). In clinical practice, we have previously worked with comparatives and equatives using the shapes, though without the black measurement symbol – this had previously been coded green as part of the adjective. We hope that this innovation will improve clinical outcomes in this area and help children link comparatives and equatives to other degree modifiers, which may in turn help them to use and understand these in the curriculum.

Teaching children with DLD what forms adjectives take

In the SHAPE CODING system, different word classes appear in different colours. For words which are superficially ambiguous as to their word class, we show children that they can be different colours and hence go in different positions in the sentence. For example, *clean* could appear in blue (verb) or green (adjective), and *metal* can appear in red (noun) or green (adjective); see Figure 9.

Adjectives with inflectional morphology (e.g., for gender and number in languages with agreement, see "What forms do adjectives take?") do not change word class from the root form and hence still appear in green. However, where it is helpful to show plurality we use double versus single lines and for gender solid versus dashed (vs. dotted) lines. Likewise, adjectives with inflectional morphology for comparison do not change word class. Here the comparative affix or degree modifier is shown with the black measurement symbol, as in Figure 8.

Because adding derivational morphology changes the word class (cf. "What forms do adjectives take?"), the modified word appears in a new colour. So, we teach children with DLD rules such as;

- Adding *-ly* turns a word from green (adjective) to brown (adverb): *slowly, quickly*

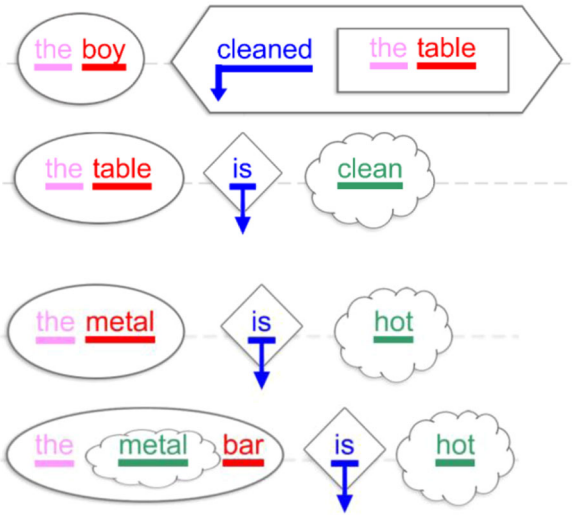

FIGURE 9 Distinguishing word classes using the SHAPE CODING system [Colour figure can be viewed at wileyonlinelibrary.com]

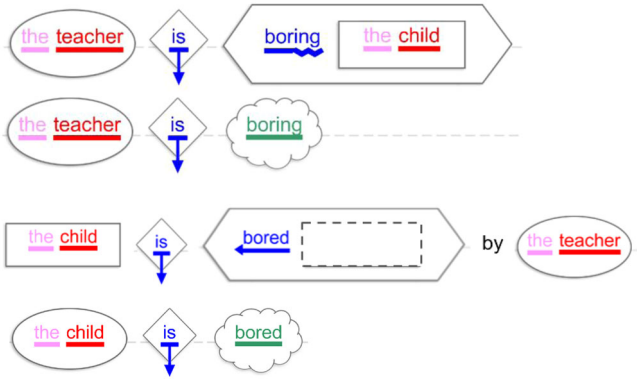

FIGURE 10 The relationship between verbs in active and passive and adjectives [Colour figure can be viewed at wileyonlinelibrary.com]

- Adding *-en, -ise* turns a green word into a blue word (verb): *lighten, modernise*
- Adding *-ness* or changing *-t* to *-ce* turns a green word into a red word (noun): *darkness, silence*
- Adding *-y, -ic, -ous, -ly, -ful, -less* turns a red word into a green word: *bumpy, artistic, dangerous, friendly, beautiful, powerless*
- Green words (adjectives) can be created from blue words (verbs), but these are tricky; adding *-ive, -ing* describes the person (in the oval) doing the action*: creative, accepting, interesting, boring,* whereas adding *-able, -ed, -en,* describes the person or thing in the rectangle: *acceptable, interested, bored, broken.*

We then teach children to find and separate any suffixes in unknown words, as this may lead them to a familiar root word, which they could use to guess the meaning of the new derived word from the root plus suffix, for example, "*bumpy* looks like a word I recognise: *bump*, plus a suffix I have learned: *-y*, so I can guess that *bumpy* means it has some bumps" (see Glisson et al., in prep; Ebbels et al., 2022).

In the SHAPE CODING system, for transitive verbs, the external argument (in the oval) is the AGENT and the internal argument (in the rectangle) the PATIENT. Thus, we can show that some adjectives relate to the participant in the oval of the sentence containing the transitive verb and that some relate to the one in the rectangle (see Figure 10). We can also show that the adjectival passive is linked to the passive sentence where the Patient (in the rectangle) has moved to the front of the sentence and the Agent (in the oval) to the end and the passive morphology is added to the verb.

Teaching children with DLD what adjectives mean, how they are related to each other and their links with syntax

Section "What do adjectives mean?" described the semantic properties of adjectives in terms of animacy, temporal endurance, subjectivity, gradability and semantic domains. Here we discuss how these linguistic phenomena could be taught to children with DLD, together with a suggested order. However, while these suggestions are based on the semantic properties described in "What do adjectives mean?", their efficacy in supporting adjective understanding and learning in children with DLD remains to be tested.

Animacy and temporal endurance

As introduced in "Teaching children with DLD where adjectives appear", children need to learn that only animate subjects (answering WHO) can have emotions and therefore can combine with adjectives which answer a HOW FEEL question. For example, people and animals, but not towers or trees, can feel *hungry*, *tired* or *bored*.

As noted in "Temporal endurance", only adjectives that signal temporally bound (not enduring) properties may be used with certain adverbial modifiers. For example, *hungry* is a transient property that can be true at a certain time, but false at others. When using temporal adverbials with children with DLD, we use arrows to indicate tense (blue arrows on verbs) and time (black arrows on the time adverbial triangle): on the left for past and in the

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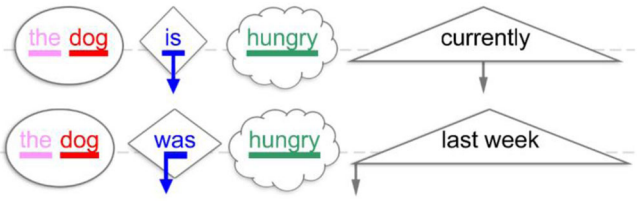

FIGURE 11 Sentence templates including time adverbials [Colour figure can be viewed at wileyonlinelibrary.com]

middle for present tense and time (see Figure 11). Some children might need to be taught that enduring adjectives such as *British* or *intelligent* cannot be modified by certain temporal adverbials (e.g., *currently* or *last week*).

Gradability, semantic domains and subjectivity

Due to their close interrelationships, we consider gradability, semantic domains (especially synonyms and antonyms), and subjectivity together. We suggest a possible order for teaching adjectives involving these features. It will be important for professionals to show children with DLD how adjectives are divided into gradable (particularly useful in maths and science) versus non-gradable and relative versus absolute categories, and how these affect the syntactic structures in which they appear. This section contains wholly innovative ideas: the visuals and ideas below have not yet been trialled with children with DLD.

We propose that non-GAs may be the easiest to learn because the properties are either present or not; there is no degree, comparison or subjectivity involved. We suggest starting with non-GAs with no single antonym, so that the child needs to decide only if the property is present or not. Science-based adjectives could be particularly useful here, for example describing the materials that an object is made of, for example, *this chair is (not) plastic/wooden/metal* (see Figure 12). In this visual, we show antonyms on opposite sides of a hard dividing line.

Some children might need to be explicitly taught that these adjectives cannot appear in degree or comparative constructions (see Figure 8). For contrast, this might best be done after GAs have been introduced.

Gradable adjectives are crucial to maths and the areas of science that require measurement. Children need to understand and use these in degree, equative (*as… as*) and comparative constructions (*more/less…than*). We suggest a stepped approach to teaching these, starting with absolute minimal GAs (Section "Gradability"). Because these have a minimal presence of a property required (e.g., *dirty, sick, bumpy*), they might be easier to explain semantically; if there is even a small amount of dirt, sickness or bumps present, then these adjectives can be used. The derivational morphology link between the noun and adjective could also be highlighted where relevant; see "Teaching children with DLD what forms adjectives take".

A first step would be to show the difference between having and not having the property (see dotted boundary in Figure 13) and then showing that there can be increasing and decreasing degrees of the property (arrows in Figure 13). Degree modifiers such as *slightly* and *very* can be taught to indicate the degree (note that *completely/almost/nearly* cannot be used as there is no maximal constraint – see below). Synonyms (below the arrow in Figure 13) could then be associated with the degree. Figure 13 shows that there is no limit to how *dirty* an object can become (no double line at the right-hand side), whereas there is a limit to how *not dirty* it can be (double line at left-hand side). The dividing line is less definite (dashed) when compared with the non-GAs (solid line), as there is a certain level of subjectivity and comparison to other similar objects (e.g., football kits vs. wedding dresses) when deciding whether something is *dirty* or not.

Once these adjectives have been introduced, it would be possible to introduce comparatives (*X is dirtier than Y* and equatives *X is as dirty as Y;* see Figure 8). We recommend introducing these with absolute minimal GAs first because these entail that the object in subject position has the property, for example, *X is dirtier than Y* entails *X is dirty,* which is not the case for all GAs.

A next step might be to introduce absolute maximal GAs such as *clean, healthy*. We can show the maximal constraint with a double line at the end of the arrow (see Figure 14) and explain that this licenses the degree modifiers *completely/almost/nearly*. We could also discuss that since most of the variation is on the *not clean* side, comparatives where one object is *more clean* than the other, do not necessarily entail that either object is actually *clean*, just that one is closer to the *clean* side of the boundary than the other.

Next, we could introduce antonyms for GAs that have a single antonym (such as *clean* vs. *dirty*), by showing how they vary along the same dimension, but in opposite directions (see Figure 15, which shows the addition of *dirty* and its synonyms to Figure 14, which has been greyed out for clarity). This would be clearer to explain initially with antonyms where the boundary is in the same place, such that *clean = not dirty* and *dirty = not clean.*

Other pairs of absolute maximal and minimal GA antonym pairs could then be introduced where the boundaries do not fall in the same place (e.g., *healthy* and *sick*). Using a visual such as Figure 16, we could show that *not sick ≠ healthy*, and *not healthy ≠ sick,* as there is a gap where

FIGURE 12 Visuals for non-gradable adjectives [Colour figure can be viewed at wileyonlinelibrary.com]

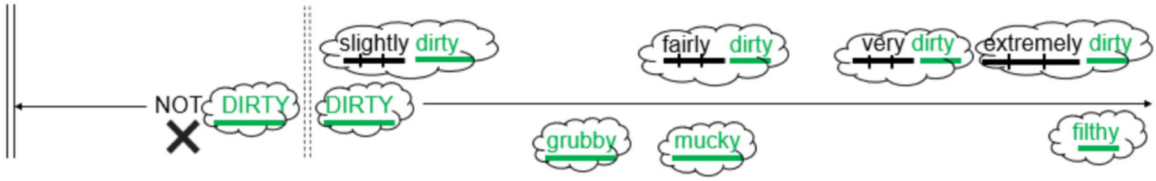

FIGURE 13 Visual for absolute minimal gradable adjectives [Colour figure can be viewed at wileyonlinelibrary.com]

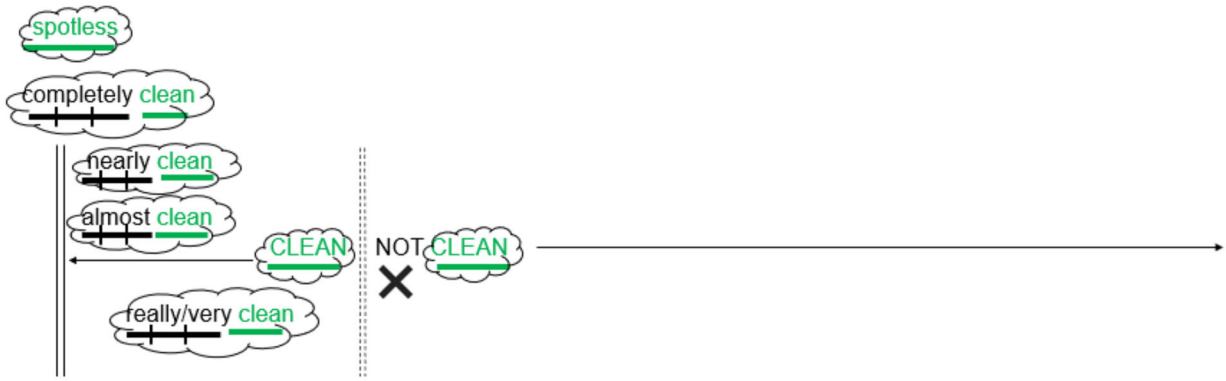

FIGURE 14 Visual for absolute maximal gradable adjectives [Colour figure can be viewed at wileyonlinelibrary.com]

it is possible to be both *not sick* and *not healthy*. This also means that in comparatives, if *X is sicker/healthier than Y*, neither X nor Y need to be *healthy/sick*.

Some antonym pairs are both absolute maximal GAs (such as *full/empty*). This can be shown by the double lines at both ends of the distribution (see Figure 17). Because both ends of the distribution are limited, it is possible to have fractional modifiers such as *half* and also to use the degree modifiers *completely/almost/nearly* for both of the antonyms.

Relative GAs (see "What do adjectives mean?") are likely to be the most difficult for children with DLD to use and understand accurately as the boundaries change with context and relative to typical cases (so a *tall jockey* is probably still shorter than a *short basketball player*, as shown by the use of *tall for a jockey, or short for a basketball player*) and also with the subjective judgement of the speaker. Because these have no maximal constraints (no double lines in Figures 18 or 19), it is not possible to use the degree modifier *completely,* or fractional modifiers such as *half*. In Figure 18, we show that an individual could be described as both *tall/not short* and *short/not tall*, depending on who you compare them to.

Because the boundaries can move dramatically with context, we would recommend starting with individual objects to establish the concept of the adjective meaning and the dimension along which it varies. For example, regarding size, we could start with a single object (such as a pencil) and present an average length pencil and then decide from a selection of other pencils, which are *long,* which are *not long* and which are *a bit long* or *very long*. Then, a range of other items with different prototypical lengths (e.g., rulers or paperclips) could be introduced, showing that the boundary is relative to a typical item and does not relate to an absolute value. In addition, it may be necessary to show that the boundary can move relative to a purpose, for example: *the boy wants to climb the tree, but it is too tall (for him to climb).*

Synonyms of GAs could be taught where they relate to different degrees (Figure 19). Whether these synonyms themselves have minimal or maximal constraints (e.g., *completely devastated*) could also be discussed. Antonyms could then be introduced; it will be necessary to show that there could be non-overlapping boundaries, so there is a 'gap', where someone could be neither *happy* nor *sad* (see Figure 19).

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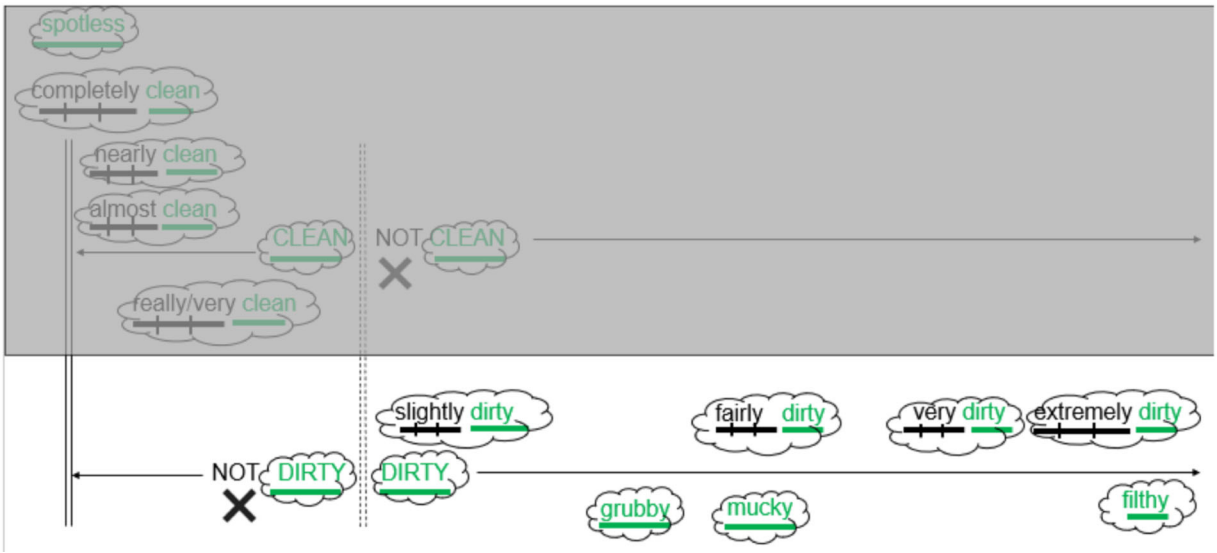

FIGURE 15 Visual for gradable adjectives with a single antonym with a boundary in the same place [Colour figure can be viewed at wileyonlinelibrary.com]

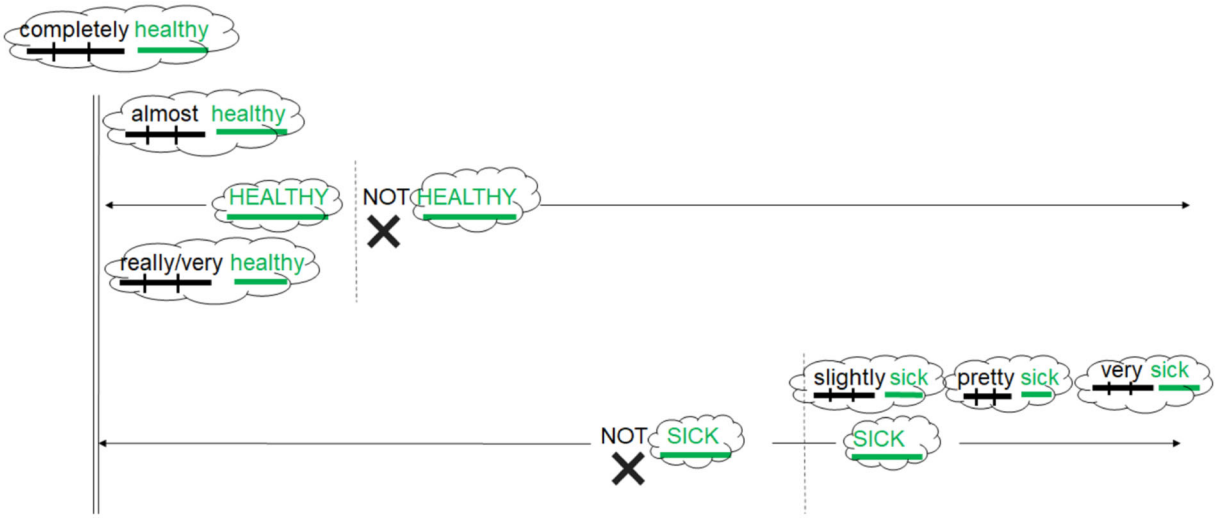

FIGURE 16 Visual for antonym pairs where boundaries are in different places [Colour figure can be viewed at wileyonlinelibrary.com]

Later stages of adjective teaching could include discussing subjective adjectives with speaker-oriented boundaries such as *fun/boring* or *delicious/disgusting*, highlighting the fact that two different speakers can have different views on these and both be telling the truth (see "Subjectivity"). This might be particularly important for children with pragmatic difficulties who may have difficulty interpreting the differing perspectives of different speakers.

Vague subjective GAs (such as *good*) could also be discussed, perhaps in the context of English lessons where use of such adjectives is often discouraged. The child could be shown that the dimension on which they vary is determined by the noun rather than by the adjective. For example, while the minimum absolute GA *dirty* depends on the presence of dirt, *good* depends on the positive aspects of the object denoted by the noun, whatever that may be, and however assessed by a speaker: a *good* cake is tasty, a *good* book is gripping/funny/short, a *good* holiday is relaxing/active/fun, etc. Therefore, when precision is encouraged, alternative adjectives are preferred.

Once children have learned the rules and patterns for some adjectives, they may be able to extend these to deduce the meaning of new adjectives used in similar linguistic environments, or be taught to do this. For example, if they hear that an object is *completely blicked*, they can infer from presence of the degree modifier *completely,* that *blicked* is gradable and an absolute maximal GA. From the

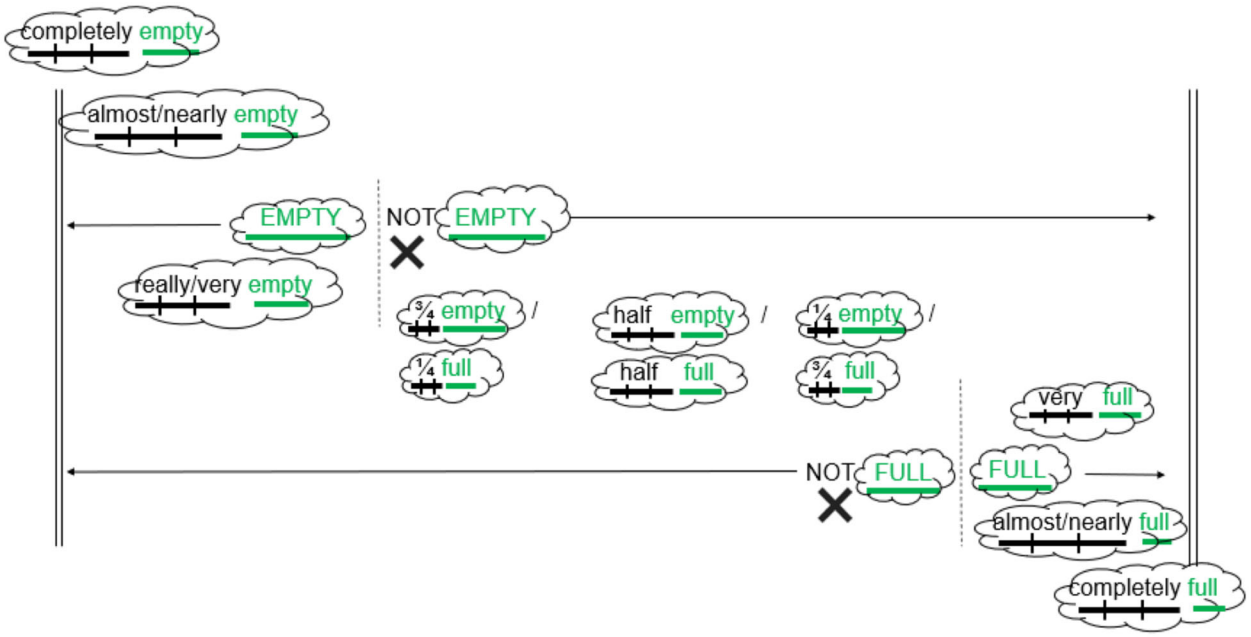

FIGURE 17 Visual for antonym pairs where both are absolute maximal gradable adjectives [Colour figure can be viewed at wileyonlinelibrary.com]

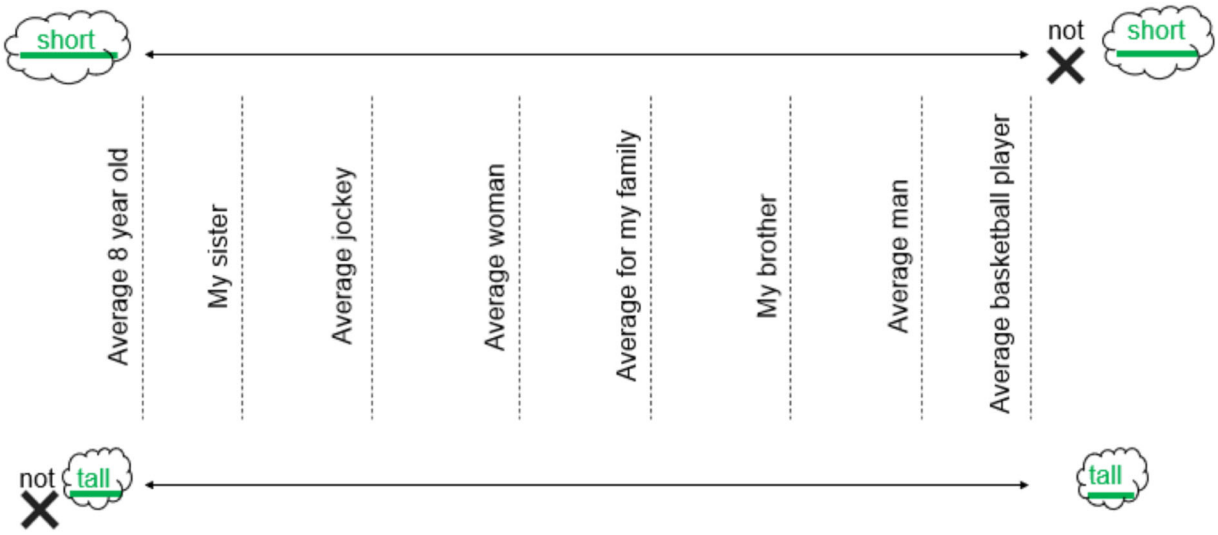

FIGURE 18 Visual for relative gradable adjectives, showing many different possible boundary positions [Colour figure can be viewed at wileyonlinelibrary.com]

derivational morphology, they can infer that it may also be an adjectival passive derived from the verb *to blick*. Conversely, once they are familiar with the nuanced semantics of an adjective, they can harness this knowledge to use it in appropriate linguistic environments.

RECOMMENDATIONS AND CONCLUSIONS

By highlighting the importance of adjectives in communication and education, their linguistic complexity, and their likely challenge for children with DLD, we have made the case for developing interventions that specifically include adjectives in a structured way. To enable this, we first provided a primer for practitioners on how adjectives function, and second, a detailed explanation of how the SHAPE CODING system can be adapted to incorporate the complexities of adjectives. As a final step for SLTs and teachers, here we present operational recommendations for teaching adjectives.

"Gradability, semantic domains, and subjectivity" describes a stepped approach to introducing the gradability of adjectives to children (see also Table 1 in "What do

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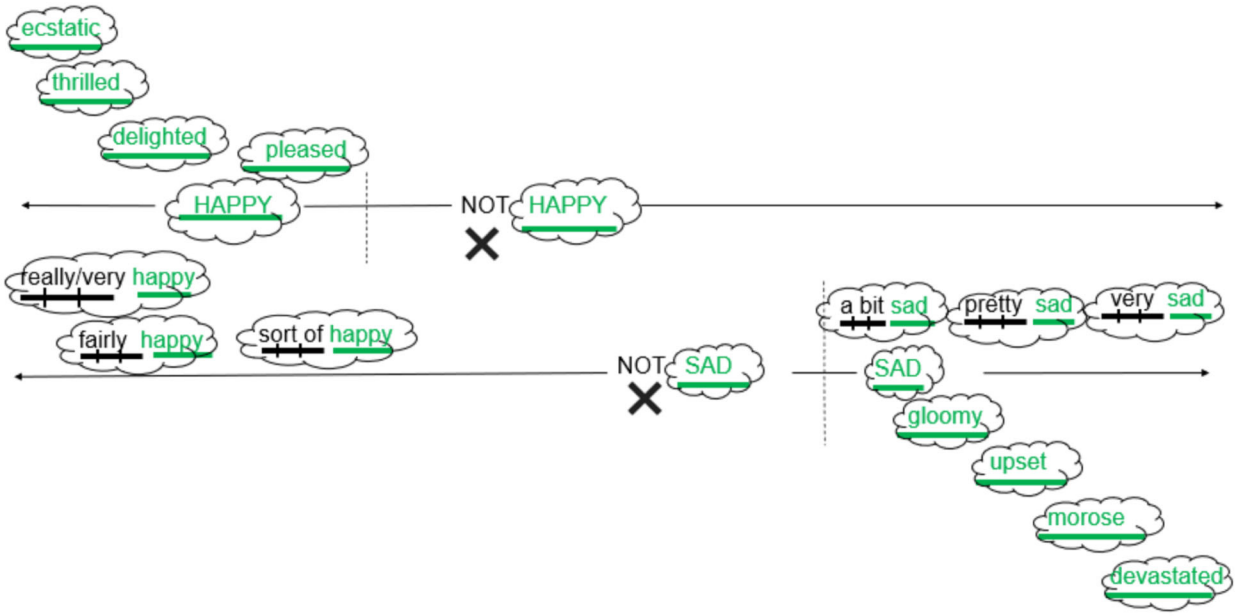

FIGURE 19 Visual for relative gradable adjectives, including synonyms and antonyms [Colour figure can be viewed at wileyonlinelibrary.com]

adjectives mean?"), starting with non-GAs with no single antonym (e.g., *plastic*) and progressing to relative GAs (e.g., *tall*) as the most challenging. Although presently untested, SLTs and teachers may find this sequence useful to try out when teaching adjectives.

There should be a focus on securely teaching curriculum-related adjectives using strategies which extend existing vocabulary approaches (e.g., St. John & Vance, 2014). For example, identifying phonological features (e.g., initial sound, number of syllables, rhyming words), linking new words to previously learnt words (both via semantics and derivational morphology, e.g., *bump/bumpy*), and building accurate motor programmes through repetition, repeated retrieval practice and use within different grammatical contexts. Questions such as *What does [noun] look like?* can be adapted for adjectives as *What things could this describe?* Degree modifiers such as *very*, *a bit,* or *slightly* can be used to teach children whether an adjective is gradable, for example, stating *This is only* ***a bit*** *ADJ, but this is* ***very*** *ADJ*. Figures 12–19 provide further inspiration for this, for example, sorting physical objects into wooden versus non-wooden (Figure 12), or placing a counter along a continuum to judge absolute minimal GAs (Figure 13).

At an individual, small-group or whole-class level, elements of the SHAPE CODING system can be used to explicitly teach adjectives. Initially, a green line and a cloud shape for adjectives can be introduced, contrasted with a black cross to show the absence of a quality (e.g., Figure 3). For GAs, degree constructions can be indicated using a 'black ruler' visual (e.g., Figure 7).

SLTs working in schools who directly commission regular SLT input (e.g., White & Spencer, 2018) may be afforded time to work with teachers within the classroom. During these sessions adjectives can be taught using the activities described above via a collaborative model (e.g., Throneburg et al., 2000). Other SLTs may hold large caseloads across multiple schools, working within a consultative model whereby intervention is delegated to school staff (e.g., Law et al., 2002). For this model, we propose that the these recommendations be incorporated into whole-school SLT training and teachers supported in selecting appropriate curriculum-based adjectives to target.

In conclusion, adjectives represent a complex and varied word-class and are often overlooked in SLT interventions, yet have a key role to play in language development and academic learning. By developing an increased understanding of the complexity of adjectives, and their importance for children's learning, we hope that SLTs and teachers can begin to adopt more nuanced and robust methods of teaching adjectives to children to improve their language skills and academic attainment.

AUTHOR CONTRIBUTIONS

Catherine Davies: Conceptualisation, investigation, writing – original draft (predominantly the sections "Introduction" and "Adjective growth in typical development"), writing – review & edit, project administration, funding acquisition. Susan Ebbels: Investigation, writing – original draft (predominantly the sections "Adjective production

and comprehension in Developmental Language Disorder" and "Interventions to support adjective learning"), writing – review and editing. Hilary Nicoll: Investigation, writing – original draft (predominantly the sections "Adjective production and comprehension in Developmental Language Disorder" and "Interventions to support adjective learning"), writing – review editing. Kristen Syrett: Investigation, writing – original draft (predominantly the section "Adjective distribution and meaning: A linguistic primer for SLTs"), writing – review and editing. Sarah White: Investigation, writing – original draft (predominantly the section "Recommendations and conclusions"), writing – review and editing. Cecilia Zuniga-Montanez: Investigation, writing – original draft (predominantly the sections "Introduction" and "Adjective growth in typical development"), writing – review and editing, project administration.

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CONFLICT OF INTEREST

Susan Ebbels developed the SHAPE CODING system. Susan Ebbels and Hilary Nicoll develop and deliver courses and develop resources on the SHAPE CODING system for their employer Moor House Research and Training Institute, which is part of the charity Moor House School & College. There are no further conflicts of interest.

NOTES

[1] The power of syntactic bootstrapping in verb learning is well documented. For example, given a choice between a scene with an agent causally acting on a patient and a scene with two agents coordinating an action, toddlers reliably look at the former when they have heard a transitive frame *The duck is gorping the bunny* versus a conjoined-subject intransitive frame *The duck and the bunny are gorping* (Naigles, 1990).

[2] Here, we use '#' rather than '*' to indicate that while these sentences are grammatical (i.e., the syntax can generate them), their meaning is infelicitous.

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