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### Developmental Language Disorder (DLD)

Developmental Language Disorder (DLD) is a persistent condition where an individual has **difficulty talking or understanding spoken language** in the absence of vision, hearing, neurological or cognitive impairment.

DLD has **many negative life-long consequences**. It impacts learning, participation, making friends and mental health. Children with DLD can develop a sense of failure in education and disengage early, resulting in a life time of disadvantage.

DLD is associated with learning and reading difficulties, social, educational and economic disadvantage, behavioural and emotional challenges, unemployment, reduced self-esteem, independence and quality of life.

#### Terminology – DLD also commonly known as

DLD has also been called language difficulty, language disorder, language impairment, language deficit, language delay, learning disabilities, language-learning disability, developmental or congenital aphasia, specific language impairment.

**Developmental Language Disorder (DLD)** is the accepted current term.

Language Disorder is used to describe persistent low language skills associated with another condition, such as intellectual disability.

#### Prevalence

DLD is one of the **most common developmental conditions**. It affects 2-3 children in every classroom.

#### Causes

DLD has **no known causes** but it can run in families. A range of gene variations have been associated with DLD. It is not caused by poor parenting, bilingualism, reduced exposure to language/learning opportunities or financial disadvantage.

**Multifactorial aetiology** - it has a range of causes relating to environmental exposures and biology/genetics that impact language learning.

#### Presentation - Signs and Symptoms

- **Hidden and under-identified** in the population due to low awareness. It is often misconstrued as bad behaviour, poor listening or inattention
- DLD has a **unique presentation** – individuals present with different severity and characteristics such as
  - o Difficulty understanding words, answering questions and following instructions
  - o Difficulty using words, organising sentences, telling stories and having conversations
  - o Difficulty learning, reading and writing

#### Diagnosis and Treatment

Diagnosis is important to **provide adequate support and improve long-term outcomes**. There is no treatment for DLD but appropriate diagnosis and support can develop skills of children. Diagnosis and intervention are provided by a Speech-Language Pathologist (SLP). Research highlights effectiveness of strategies and targeted skill development to provide extra opportunities to learn language. Supports and adjustments are essential so individuals with DLD can live happy, healthy, successful and meaningful lives.

#### Key points and Myth-Busting

- DLD is often hidden – **misconstrued as bad behaviour/inattention/stupidity**
- It is not caused by poor parenting, bilingualism, reduced exposure to language/learning opportunities
- While some toddlers who are slower to develop language catch up (20%), if low language skills persist in children beyond 5 years, they are likely to be diagnosed with DLD
- DLD is not associated with lower intelligence
- DLD is **life-long and persisting**. Children with DLD do not 'outgrow' their language problem or 'catch up' to their peers without support and intervention
- DLD cannot be treated but **appropriate diagnosis and intervention** and support can develop skills of children and **reduce negative life-long outcomes**
- Children with DLD are unique. Not all children show the same profile or intervention needs. Hence an individualised and tailored intervention should be provided following a comprehensive assessment to determine **child-specific strengths and weaknesses**



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### Developmental Language Disorder (DLD) - Helping Parents, Teachers and Speech Language Pathologists Understand the FACTS

DLD is currently misunderstood – parents, teachers and other professionals need more information about the difficulties encountered and life-long implications.

The following provides a summary and simplification of the current research knowledge available on DLD. For more details, please see the full manuscript.

We acknowledge that DLD is complex and multifaceted across a broad range of difficulties so it is recommended to seek support/advice from a SLP or professional to help with initial assessment and intervention strategies to provide a child with the right support and best chance of success.

#### Hearing

- Individuals with DLD can have a history of transient hearing impairment and ear infections (otitis media)
- While **traditional hearing is intact**, children with DLD can have speech perception and **auditory processing skill deficits** – when the brain has difficulty understanding and interpreting heard information
- Treatments for auditory processing skills and disorder in children with DLD are controversial; there is little evidence that working on auditory skills improves language skills
- Children can have problems listening in noisy environments. Sometimes recommendations about reducing background noise are made

#### Recommendation

- Children with DLD need a hearing assessment

#### Vision

- Children with DLD can have **visual processing impairments** and vision problems not identified by traditional vision tests – they may have trouble making sense of what they see (trouble copying, noticing differences in pictures and letters)

#### Recommendation

- Children with DLD need a vision assessment
- They can benefit from visual cues that help with processing information and comprehension

#### Sensory Processing

- Children with DLD may have **sensory processing problems** – challenges interpreting and responding normally to touch, smell, taste, seeing, hearing
- Children may process information differently, impacting learning
- Sensory processing problems can lead to unusual behaviours, self-stimulation, avoidance of activities
- Sensory processing research in DLD is limited

#### Recommendation

- Children with DLD should have a sensory processing assessment (see an occupation therapist)
- Early research suggests children with DLD may increase talking after vestibular stimulation

#### Motor Skills

- **Motor skill deficits** are more common, yet majority have no motor problems
- Children can have problems sequencing motor tasks, compromised visual-motor integration, show generalised problems with slowed and under-developed gross and fine motor abilities and have Developmental Coordination Disorder, resulting in clumsiness and poor handwriting, throwing, walking
- Children with DLD can have **problems with oral movements** and are more likely to have **Speech Sound Disorders**

**Use of gestures** - Children with DLD can 1) have difficulties producing gestures 2) produce more frequent gestures to replace words or 3) reply more on gestures and visuals to aid their understanding of language

#### Cognitive Skills

##### Attention

- Children with DLD may have **attention problems** (sustaining or shifting) and co-morbid Attention Deficit Hyperactivity Disorder (ADHD)
- **ADHD is more common** in children with DLD, yet many children with DLD do not have ADHD
- Children can have particular problems attending to auditory and speech and language information



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### Memory

- Some children have **working memory deficits** – including phonological/verbal and visuo-spatial working memory
- Can have reduced working memory capacity – amount of information they think/hold in their mind
- Reduced memory capacity can result in cognitive fatigue associated with sustained mental effort, diminished focused, mental energy, academic problems and sense of failure in learning
- declarative (fact learning) or procedural (skill learning) memory can be impaired
- Long-term memory formation is often intact but children may not stabilise or maintain memories as well as typically developing children (have inefficient storage mechanism)
- Treatment of memory deficits do not have consistent outcomes and do not generalise to different activities and are therefore considered ineffective

#### Recommendation

- Compensatory strategies such as information chunking and linking new information a child knows or understands to new information is recommended (due to reduced working memory capacity)

### Processing Speed

- Children with DLD can have **reduced processing speed** (time required to perceive, understanding information and respond) or problems processing bits of information (putting information together)
- They do better at tasks that use successive processing, where stimuli occur in a set serial order and show a progression—like in learning the alphabet, digits, multiplication tables

#### Recommendation

- Allow focus on one task at a time, reduce distractions, amount of given information (sequence steps in a task), simplify words and information, reduce speaking rate and give children with DLD more time to process information, respond to questions, make a decision or act. Including successive processing tasks can support learning

### Problem Solving

- Children with DLD can have **problem solving difficulties** - finding effective solutions to challenges
- They can have impairments in analogical and deductive reasoning (making inferences)

### Learning

- Children can have **problems with learning**, including explicit learning (intentional, memorising) and implicit/statistical learning (indirect learning by non-consciously extracting information from environment)
- Children can have difficulties with declarative (fact) & procedural learning (sequenced motor activity)
- As gaps in learning increase, children with DLD fall further behind peers. They can learn to 'give up' due to experience not learning, even though they make reasonable attempts. Over time they become discouraged and think they are incapable of learning.
- The steps of learning new information include: Establishment Phase—Stabilization Phase—Generalisation Phase—Maintenance Phase – Children with DLD need longer stabilisation, generalisation and maintenance phases when learning a new skill. Therefore, they need more time to establish a skill and have difficulty developing use of the skill out of the initial learning context

#### Recommendation

- Determine individual learning style for children with DLD (auditory, visual, tactile) to support interventions and best learning approaches

### Executive functioning

- Individuals with DLD may have **impaired executive functioning** – cognitive processes enabling individuals to plan, focus attention, remember instructions, juggle and prioritise tasks and monitor and self-regulate behaviour/control impulses
- Impairment results in problems being organised, planning, adapting and persisting, working independently, initiating and completing activities, controlling emotions/impulses

#### Recommendation

- Children should see a psychologist to determine cognitive skill capacities to support individualised speech-language intervention and targets

### Speech, Language and Communication Skills

#### Vocabulary

- Children with DLD know **fewer words**
- Have problems learning and using new words (fast mapping), retrieving words (word finding) and use less precise, incorrect and nonspecific words (this, that, them, you know)



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### Recommendation

- Learning vocabulary is useful for language use, comprehension and development of literacy skills. A range of successful interventions exist
- To learn words, children need more exposure and learning over longer time periods, including linking words to known knowledge

### Comprehension

- **Problems comprehending** aspects of language result in difficulties understanding sentences, instruction, questions, conversations, making inferences (idioms, proverbs, metaphors, similes, humour, and slang)
- Reduced understanding of read passages, interpreting and using figurative expressions
- Comprehension problems can also be associated with poor attention, memory, processing speed, vocabulary, and other factors

### Recommendation

- Important to have an assessment by a SLP to determine which aspects of language are not understood
- A number of evidence-based programs support comprehension

### Grammar, Syntactic and Morphologic Skills

- Children often have a **grammar development delay** and present with **grammatical errors** - ongoing more subtle difficulties may persist into adolescence
- Produce shorter utterances, more simple sentences
- Individuals have different ranges of errors and problems using grammatical structures
- Often present with wordsoc order errors, problems joining sentences (clauses) and using joining words (e.g., for, and, not, but, or, yet, so).
- Adolescent often join clauses/phrases and sentences with 'and then' (create run-on sentences)
- Metalinguistic deficits making it difficult for children to judge accuracy and correct their grammar errors

### Recommendation

- Appropriately collect and analyse language samples to uncover any difficulties with grammatical structures. Standardised assessments, such as the CELF, do not adequately identify exact nature of language impairment
- Extensive research exists on how to develop grammatical structure use in conversational, narrative, and written communication

### Articulation

- Many children with DLD have **articulation errors** (incorrectly producing sounds, syllables or words) or difficulty processing sound-based information
- Children may substitute sounds ('wabbit' for 'rabbit'), omitting a sound (saying 'top' instead of 'stop'), or distorting a sound
- Multiple errors make it difficult to understand children, which can impact literacy, social life and perception of self
- Many children with sound errors report bullying and problems making friends

### Recommendation

- Successful interventions exist to remedy sound errors
- SLPs should examine articulation skills of children with DLD and consider whether to treat these as a priority or simultaneously with language skills (current specific research advice is not clear about priority)

### Fluency

- There is a subgroup of children with DLD that show **fluency difficulties** or have more disfluencies than typically developing peers, specifically more part-word and whole word repetitions, speech disruptions (silent pauses) before phrase
- Many children show **hesitation phenomenon** - silent pauses or filled pauses with "uhm", "er", "ahh - that signal holding a turn in a conversation while additional time is needed to plan what to say
- Many children who stutter show increased difficulties with language

### Pragmatics, Conversational Skills, & Social Communication Impairments

- Many individuals with DLD have **conversation, pragmatic and social skill difficulties** resulting in problems with peer interactions
- Those with DLD with pragmatic problems have a **Pragmatic Language Impairment**
- These include problems with conversational skills (difficulties initiating, entering, ending and maintaining conversations), pragmatic functions (requests for actions and information), and perspective taking (inferring intent of others) - **Theory of Mind** and social cognition
- Children with DLD are often hesitant to initiate conversation even though they have a desire to engage with others (appearing reticent and shy)



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- They can be non-responsive to initiations of conversation by peers or are ignored by peers.
- They can have problems changing and staying on topic, taking turns during conversations (can interrupt) or end conversations (may abruptly walk away)
- They may fail to provide specific or correct information or detail to listeners, have more communication failures and lack the ability to repair conversation failures
- They make fewer requests for clarification when not understanding a conversation or direction and may have poor negotiation skills
- Some with DLD use a reduced range of request forms (to obtain objects, actions, information or permissions) and do not use higher level politeness strategies (indirect requests). They may therefore falsely present as rude
- They use more 'back channel' responses (like 'Yes', 'uh huh', 'okay', 'hummm', 'oh'). This gives a false show of understanding conversations
- Children with DLD are more likely to prefer adult communication partners and rely on others to initiate conversations
- Children may be less skilful in social skills; but some may improve social skills in later childhood
- It is unclear if problems with social interactions are related to social tasks that require language skills or if children have deficits in social competence

### *Recommendation*

- SLPs should examine children for suspected problems with pragmatics, social and conversational skills. Children should receive an evidenced-based intervention to support skills. Research evidence has demonstrated that many pragmatics, social and conversational difficulties can be improved

### **Prosocial behaviours**

- Many children with DLD often show prosocial behaviours (positive social interactions) - respond positively to others' needs and welfare. They can be cooperative, empathetic, sharing, kind, and helpful.
- Children with DLD can be within normal limits for prosocial behaviours (usually a relative strength) but in general, teachers rate children with DLD as less prosocial than their peers
- Children with prosocial behaviours have better peer relationships

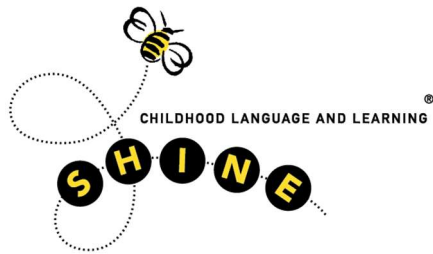
- Adolescents who are more prosocial have less internalizing and externalizing behaviour problems

### **Play and Interaction Skills**

- Many children with DLD have **problems with play and interacting with peers**
- Their play is less sophisticated and atypical, however, there are individual differences and some children with DLD develop adequate play skills
- Children can struggle to initiate and maintain play routines and integrate into peer social play
- They engage in more isolated play - spend less time interacting and more time withdrawn, watching others
- They are often actively excluded by peers and spend less time in the playground
- Children with DLD do not have the language, social, conversational or negotiating skills to resolve disputes when they have trouble on the playground
- Children can have problems participating in groups and are less active participants
- When forced to participate in groups requiring close interaction with others, they may demonstrate higher levels of aggression than usually observed
- They can struggle with rules for non-verbal games
- Children with DLD tend to be **significantly shyer** than peers and hesitant to initiate conversation even though they have a desire to engage with others. Shyness and reticence traits are associated with tension, discomfort and inhibition in the presence of other people. Shyness inhibits interpersonal communication, social acceptance, and the development of interpersonal relationships. It is associated with lowered self-esteem and receiving more negative ratings from other people. People who are shy are often aware of themselves. They can be wary or even fearful of joining social groups
- Individuals show lower sociability and withdrawal
- Withdrawal can lead to higher levels of negative social outcomes including affecting friendships

### **Friendships**

- Children with DLD can have **difficulties forming and maintaining friendships** as a result of difficulties with play, emotions and behaviour
- They have **fewer friends** or poorer quality relationships, related to social confidence or shyness.
- People with DLD rate themselves as lonelier at school
- They are often not selected by peers to be friends
- They are more likely to experience high rates of rejection and have fewer positive peer contacts



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- 50% have problems with pragmatic and social skills, - associated with more difficulties with peers; however, many children may overcome these problems as they age and some adolescents and adults show normal friendships
- 60% of adolescents report good quality friendships Those with good quality friendships have more favourable long-term outcomes

### Recommendation

- Additional work needs to be done to develop appropriate friendships for children with DLD. Developing these skills may reduce mental health problems

### Social, Emotional & Behavioural Implications

- Longitudinal studies report **higher levels of persistent socio-emotional, behavioural difficulties** throughout life that begin early
- Children, adolescents, and adults with DLD are more likely to experience emotional difficulties (and dysregulation), such as **stress, anxiety, depression, withdrawn behaviour and shyness** that can contribute to higher rates of persistent peer rejection and lower self-esteem
- Those with more severe DLD are more likely to suffer socio-emotional challenges
- Anxiety, depression, academic problems and loneliness is higher in those lacking social supports

### Bullying & Victimization

- Children and adolescents with DLD self-reportedly **suffer higher rates of bullying and victimization** which can exacerbate or cause emotional difficulties
- Yet some children with DLD may misread bullying situations
- Bullying can be physical aggression (hitting, pushing), verbal aggression (name calling, inappropriate remarks), relational harassment involving social manipulation and exclusion, and the spread of unpleasant rumours.
- Victims of chronic bullying or teasing (physical and verbal assaults) are at risk for poorer social, emotional and academic outcomes, including anxiety, depression, impaired concentration, somatic symptoms, reduced self-esteem, absenteeism and suicidal ideation.
- People with DLD who have a better understanding of **emotional regulation** (control of their emotions) are less likely to be victims

### Recommendation

- Professionals need to be aware of the risks to people with DLD. Every attempt to reduce bullying, the effects of bullying and support emotional regulation strategies and resilience should be made to improve the lives of children with DLD.

### Social Phobia

- Children and adolescents are **at risk of social phobia** (avoiding social situation requiring communication)
- Those with social phobia can experience **extreme and persistent anxiety associated with social or performance situations** and avoid those specific situations, such public speaking & social interaction
- This is consistent with a tendency of individuals with DLD towards internalizing difficulties, such as withdrawing and reticent behaviour. Reticence behaviour is a type of withdrawal characterised by fearful and anxious behaviour in social situations in spite of the child being motivated to interact

### Self-Esteem

- Preadolescents and adolescents with DLD show **lower levels of self-esteem**, related to social relationships and academic abilities
- Once adolescents with DLD leave school and an academic focus and shift towards a more personalised and vocational experience, their self-esteem can improve

### Self-Perception

- Children and adolescents with DLD can have a **negative self-perception** due to consistent poor achievement and stigma associated with DLD label
- The meaning that children assign to their disability (or label) may influence their perception on their performance. Students often compare themselves with peers in their environment.
- Academic self-perception about one's ability, hard work and willingness to have a 'go' are influenced by learning strategies and success
- Children and adolescents with DLD **experience repeated failures, resulting in a negative self-image and self-concept about oneself and lower self-esteem**
- Academic self-concept and academic achievement are predictors of future achievement – student engagement in school is a measure of one's attitude towards learning. Student engagement is centred around motivation. Willingness of a student to cooperate in the learning and school tasks is an important factor in student wellbeing. Feeling inadequate or experiencing failure will lead to more



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failure and a lack of willingness to try something new. Children and adolescents with DLD then do not want to invest time or energy in trying to learn if they have repeatedly experienced failure

- This **attitude** makes a person with DLD **vulnerable to emotional issues, school problems, and an increased belief that they cannot achieve**. This can lead to lower self-esteem, maladaptive behaviours, learned helplessness, lower academic expectations and increased negativity towards self, school, and life
- Negative self-perception **can result in internalising difficulties** such as loneliness, anxiety, stress and depression. Some **may externalize their feelings** that lead to aggression, risk taking and delinquency
- The greater the number of difficulties in language, communication, social interactions, the more likely these problems will occur and persist
- **Negative self-perception is influenced and reduced by attitude, true inclusion** (real acceptance and participation as an equal member in school or community), acceptance of problems by the child and others, and school/home support

### Youth Suicide and Self-Harm

- Individuals with DLD are **more susceptible to self-harm and suicide**
- Adolescents with DLD and LD are 3 times more likely to attempt suicide - 50% of teens under 15 completing suicides have a learning disability, 60% of which are related to depression
- Increased susceptibility to self-harm includes 1) initiated behaviour (self-cutting, jumping from heights, risk behaviour) 2) ingested substances 3) ingested recreational or illicit drugs

### Emotional Regulation

- Emotional regulation is the ability to monitor, evaluate and modify emotions that arise in different situations
- Emotional regulation affects social outcomes - reflects popularity and social competence
- People with DLD who have a better understanding of emotional regulation have lower levels of victimization. Maladaptive emotional regulation strategies are all associated with higher levels of internalizing problems (e.g., depression, anxiety) in young people with DLD

### Recommendation

- Parents, teachers, and professionals need to be aware of the increased risk in people with DLD for mental health problems. More work needs to be

done to reduce and eliminate mental health issues from occurring. These problems need to be identified early and treatments provided.

### Behaviour and Delinquency

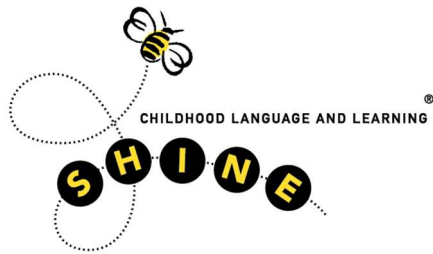
- Children with DLD (50-70%) have **more behaviour problems** that usually persist
- These can be **externalising** (poor behaviour-violence, rule breaking, aggression, emotionally reactive, conduct problems, bullying) **or internalising behaviour** (emotional problems, such as anxiety, depression, being socially withdrawn)
- Factors affecting behaviour include 1) Influence of environment 2) changes over time; and 3) individual's strengths & weaknesses
- There is an **increased incidence of delinquent and aggressive behaviour** in DLD
- Adolescents and young adults are **overrepresented in the youth justice system** most commonly for violence and offences against property 50-60% of adolescence (17 years) in the justice system have language disorders
- Individuals with DLD are twice as likely to reoffend
- People with DLD have reduced capabilities in interviews with police about maltreatment (abuse or neglect) or youth offending. They have difficulty understanding their rights read to them by police
- Between 19-24 years, adults with DLD have the same rates of incarceration and rule breaking

### Recommendation

- More work needs to be done to reduce behaviour difficulties and arrest rates in DLD. **Providing appropriate support may reduce incarceration rates**

### Academic Skills

- Children with DLD **struggle to access the curriculum and experience many academic problems that require special support**
- As gaps in skill levels increase, children with DLD fall further behind peers in educational attainment through primary and secondary school
- Children with DLD perform **poorer across all school areas** with more problems in curriculum requiring language skills – English is often the weakest area, followed by maths and sciences. Children might additionally struggle in art or physical education, even though these areas are often a relative strength
- As they progress through school, they can show increased concerns about academic achievement



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and rate their scholastic competence as lower compared to their peers

- As they struggle to learn, they can become discouraged, learn to 'give up' and think they cannot learn, resulting in lower self-esteem
- Research findings indicated they achieve lower levels of education and educational success and are more likely to fail grades (25% repeat a grade) and drop out of school

### Recommendation

- Academic skills need to be monitored and assessed
- Additional work is likely required to help children with problems overcome their difficulties
- Many children with DLD have potential to reach or exceed educational targets that are set for typically developing children with appropriate support
- Without additional appropriate, targeted, evidenced-based intervention, they will fall behind their peers
- **There is a need for funding models in Australia to include support and intervention for children with DLD. Currently DLD is not recognised or included in the National Disability Insurance Scheme (NDIS)**
- Children with DLD are unique. Not all children show the same profile or intervention needs. Hence an individualised and tailored intervention should be provided following a comprehensive assessment to determine child-specific strengths and weaknesses
- Overcoming some of the difficulties with language and literacy skills in school may lead to job opportunities in the future

### Oral narrative skills

- Children with DLD show **ongoing problems in comprehension & production of narratives**, including use of fewer story grammar elements, words/sentences (producing shorter stories), lexical diversity (how many different words appear in the narrative), complex sentences and cohesive ties. They make more grammatical errors
- Problems with narratives continue to be apparent as children get older and are less likely to resolve over time without treatment. This can also impact their ability to retell an event, such as an incident on the playground

### Recommendation

- Providing support and explicit intervention in the area of oral narratives has been shown to support other academic areas, including reading comprehension

### Literacy skills

- Children with DLD **often struggle to learn to read**
- They show difficulties with phonological awareness (predictor in literacy development), identifying letters and letter sounds, sounding out words, reading rate (read slow) and reading comprehension
- Reading comprehension difficulties can be the result of difficulties with language comprehension, vocabulary limitations and taking longer and more cognitive effort to read a passage – cognitive load
- Reading rate can be slower due to refusal to read and difficulties sounding out and with rapid automatic naming skills (RAN) – ability to name letters, symbols and words quickly
- Their reading can be less accurate. Children can have a tendency to look at the first letters in a word and guess rather than sound out the word
- There is still lack of clarity about whether children with DLD are the same, overlapping, or separate populations to those with literacy difficulties. The relationships between DLD and literacy skills (Learning Difficulties & Learning Disabilities, such as Dyslexia) is strong but complex. DLD is closely associated with literacy problems/dyslexia – many but not all children with DLD have reading problems. Many but not all children with dyslexia or reading problems have or have previously had language learning difficulties in early life that resolved. There is a small group of children with DLD with hyperlexia, who can identify words and sound them out but do not comprehend what they read

### Writing and Spelling Skills

- Up to 15% of children with DLD have a **writing disorder** that persists into adulthood
- They are more likely to have problems learning to spell and make spelling mistakes
- Their handwriting can be slow, uneven and less legible than peers
- Their writing often contains punctuation and capitalisation errors/omissions and more grammatical errors e.g. omitting subject nouns, the auxiliary and copula (is, are, were), inflectional morphemes (past tense)
- People with DLD are less likely to review or revise their written work, and when they do this - they often do not detect problems and do not know how to make corrections
- Children with DLD often have problems starting writing tasks - generating ideas or deciding what to





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write about. They often fail to create a writing plan to support cohesion

- Children with DLD often have trouble organising and writing a story. As with oral narratives, when writing children with DLD include less words, lexical diversity and content and produce incomplete and poorly organised stories that lacks an appropriate narrative sequence and cohesion. They may add more irrelevant information (off topic information) than their peers.
- Children with DLD often have problems with paraphrasing to simplify information, repeating an idea for emphasis, and elaborating on an idea

### Numeracy & Maths

- Children with DLD are 4 times more likely to have **problems with numeracy & maths**  
They can require more time to do basic math activities and struggle with naming written numbers (transcoding), writing spoken numbers, matching spoken and written numbers, remembering count sequences and rote counting, manipulating the counting sequence by counting on from a given number or counting backwards
- They often have difficulties on math tasks that require exact calculations, make more calculation errors (including basic addition and subtraction) and use immature calculation strategies (e.g., finger counting); their errors are often procedural
- Children with DLD may have problems using math fact retrieval strategies and understanding and applying (using) mathematical symbols/notation which can lead to errors in computation
- They appear to have intact symbolic and non-symbolic approximate number skills that help make approximate arithmetic e.g., they can indicate if items are more or less approximate
- They do more poorly on math story problem tasks
- Children who show early counting difficulties likely have continuing difficulties as they get older
- Adults (24 years of age) with DLD struggle with finances; financial literacy skills are reduced

### Recommendation

- Strategies that reduce linguistic load in maths activities (use of words to describe math problems and activities) can help children with DLD

### Learning Second Language

- Children with DLD are often exempt from studying foreign languages because they need additional work on English or attend special remedial/therapy

sessions. However, this strategy is not based on research. There is some evidence that indicates that **learning a second language can improve awareness of a native language, critical thinking, and executive functioning**

- Some children with DLD who are taught a second language have shown **improvements in English processing speed and attention**

### Life After School – Training & Employment

- People with DLD are at significantly increased risk of experiencing **long-term unemployment and under employment**
- There is often failure to find or maintain paid employment, with chances reducing with increased severity of DLD and employment experiences mixed depending on environmental opportunities
- People with DLD are less prepared for job seeking
- They occupy more part-time jobs (under-employed)
- Young adults with DLD sometimes obtain vocational qualifications, although a small number complete secondary school and some complete undergraduate university degrees
- About 1% of university students identify they have DLD. These numbers appear to be increasing. Yet university students with DLD report having more difficulty learning from lectures
- Once adolescents with DLD leave school and move into a freer environment their academic self-esteem Improves - a move away from a strong academic focus to more personalised and vocational experience can lead to improved self-esteem.
- Individuals with DLD have better outcomes than in previous decades with 44% of adults with DLD obtaining at least one qualification post compulsory years of school
- There is considerable variation with some individuals with DLD showing good educational and employment outcome
- People with DLD make job choices that are influenced by literacy skills – they often occupy lower skill employment positions or those that rely less on literacy skills

### Recommendations

- Overcoming some of the difficulties with language and literacy skills in school may lead to more job opportunities in the future
- The most significant implication of difficulties experienced with learning during school is the impact they have after school and on employment



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prospects. School exists to provide basic skills for adult life. More focus should be provided at school on learning practical skills for life and employment opportunities for students with DLD

- In Australia there is an emphasis on helping people with disabilities to 'get a job' through the NDIS but unfortunately, people with DLD are not recognised by NDIS or skill providers supporting employment
- Society should be more aware of the needs to support individuals with DLD to get appropriate training and employment. This would be of benefit on a societal and individual level - having a secure, suitably paying, and satisfying job can lead to independence and a happier more satisfying life as one grows older

### Quality of Life & Independence in DLD

- Adolescents with DLD are **less independent** than peers. They are more likely to live with their parents and be dependent on them
- Financial independence is more challenging
- **Fewer** adults with DLD (43%) have a **driver's license** at age 24 years (compared to 75% of peers) due choosing to not take the written (theory) test or failing it. Yet, no differences exist between those with DLD and peers in traffic violations, accident rates, driving confidence or road test success rates
- Individuals with DLD marry at similar rates to peers but are **more likely to get pregnant in adolescence**. The rate of being a parent is the same once adults with DLD reach 30 years
- The research is unclear and lacking about social and community involvement/leisure activities across the life span with some suggestion that people with DLD are **less integrated into their community**. They need and receive more support from others to participate in community activities
- They do not appear to have more alcohol or substance abuse problems

### Summary and Recommendations

- The document summarises the various areas of challenge for people with DLD that need additional interventions targeted at improving skills
- Individuals with DLD should be seen by various professionals and be assessed in the areas of vision, hearing, motor, speech and language, literacy and cognitive skills

- Research indicates that many with DLD have negative long term outcomes that affect their potential
- It is imperative to get a better idea of the exact profile and trajectory for each individual and a better understanding of the characteristics that affect their learning and life outcomes
- By understanding the complex issues surrounding DLD and improving skills we may be able to reduce the many co-morbid problems and quality-of-life issues associated with DLD
- Treatments and interventions may lead to better school outcomes, reduced mental health issues, and improved experiences
- Parents, teachers, and specialists in DLD need to work together to achieve better outcomes for these children
- Researchers need to be more specific about how children are diagnosed, if they fall into particular subgroups, and the characteristics of those groups to understand what places a child at greater risk. More research needs to be completed on what interventions and strategies lead to the best outcomes for children with DLD in the various areas

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