Developmental Language Disorder

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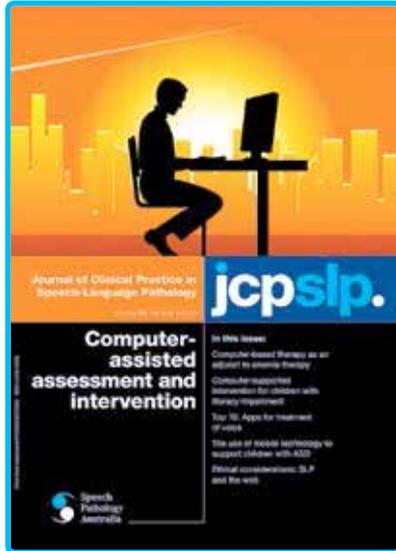Developmental language disorder and non-verbal IQ

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From the editor

Leigha Dark

Welcome to the first issue *JCPSLP* for 2018. In 2017, themes of the journal showcased relevant and topical issues and areas of practice including *Valuing the perspectives of Aboriginal and Torres Strait Islander Peoples, Shaping innovative services: Reflecting on current and future practice* and *Supporting social, emotional and mental health and well-being*. This year in the journal we aim to continue exploration of a diverse range of themes from a variety of perspectives commencing with this first issue on *Developmental language disorder*, followed by *Entrepreneurship in speech-language pathology* in July and finally *Nutrition, swallowing and mealtimes: Recipes for success*, in November.

I am very pleased to welcome Dr Mary Claessen as Guest Editor of this issue on Developmental Language Disorder. Mary brings a wealth of experience and connections in the area of DLD. She has effectively coordinated an interesting and informative issue that appraises the key research and clinical activity over recent years that culminated in the recent consensus statements about terminology and diagnostic criteria associated with language disorder. The issue also explores how speech-language pathologists are interpreting and applying latest evidence with regard to DLD, in their various practice contexts. I defer to Dr Claessen's editorial for a more detailed discussion of the inclusions, but in brief, papers by Calder et al., and Ziegenfusz et al., investigate the outcomes of language interventions conducted in specialist language school settings while the regular columns provide instructive insight into recent evidence, ethical issues regarding assessment, diagnosis, and service access and intervention effectiveness.

In addition to the focus on DLD in this issue, two papers on telehealth round out the manuscripts. Kate Bridgman and colleagues Keisha Pallathil, Nicole Ford, Joanne Tran, Di-Luu Lam, Evelyn Wee and Elaina Kefalianos investigated the experiences and perceptions of student speech pathologists delivering stuttering intervention via telehealth. Qualitative themes illuminate both advantages and disadvantages of the model and implications for clinical practice and student education are discussed. In the second paper, Srivalli Nagarajan and a large team of Australian and international colleagues outline recommendations for effective telesupervision of students on placement. With consideration of logistic, technological and pedagocial factors, the list of recommendations offers a helpful checklist for students, educators and clinicians considering this mode of supervision and mentoring.

Each issue of JCPSLP involves contributions from multiple authors – clinicans, researchers, managers, consumers. In order to continue to provide a publication of interest, relevance and rigour, the editorial team welcomes submissions both aligned with the theme of each issue and with broader focus. Timelines for submissions can be found at the end of each issue of *JCPSLP* as well as on the Speech Pathology Australia website. We also invite contact from members wishing to contibute on a particular theme to one of the regular columns, or as a reviewer of manuscripts.

Calling for submissions…

JCPSLP – Volume 20, No. 3, 2018
Nutrition, swallowing, mealtimes: Recipes for success
Due date: 13th April, 2018

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From the guest editor

Mary Claessen

Mary Claessen

In the past few years there has been lots of discussion about developmental language disorder (DLD), previously known as specific language impairment (SLI). In 2014, a special issue of the *International Journal of Language and Communication Disorders* on SLI, challenged researchers and clinicians worldwide to think more carefully about the terminology used to describe language disorder, as well as issues around diagnosis. The position papers by Bishop (2014) and Reilly, Tobin, Law et al. (2014), the accompanying commentaries from around the world, and the final overview by Reilly, Bishop and Tomblin (2014) acknowledged the mixed views prevalent in clinical and research communities but emphasised the desire for common language around diagnostic criteria and terminology that would work for services, families and individuals. Their call for an international, multidisciplinary panel to develop consistent terminology was realised in CATALISE: A Multinational and Multidisciplinary DELPHI Consensus Study. Phase 1 yielded consensus statements regarding identification of children needing specialist language intervention (Bishop, Snowling, Thompson, Greenhalgh, & CATALISE Consortium, 2016), while phase 2 (Bishop, Snowlin, Thompson, Greenhalgh & the CATALISE-2 consortium, 2017) explored termiological issues and utimately offered the terms "Language Disorder… to refer to a profile of difficulties that causes functional impairment in everyday life and is associated with poor prognosis" (p. 1068) and the term "Developmental Language Disorder (DLD)… when the languagege disorder was not associated with a known biomedical aetiology" (p. 1068).

This volume of *Journal of Clinical Practice in Speech-Language Pathology* is an exciting opportunity to explore and share what is happening in this domain within Australia. While in many states of Australia children with developmental language disorder attend mainstream schools, in both Western Australia and Queensland, there are schools that cater specifically for children with DLD. The two papers on the topic of DLD included in this issue, begin to address the clinical applications and implications of the newly proposed terminology and diagnostic criteria within these settings, as well as the ongoing challenge of demonstrating effectiveness of intervention.

The paper by Calder, Wells, Glisson, Stirling and Claessen provides some insight into how clinicians working within a *Language Development Centre* (a publically funded primary school for children with DLD) are tackling the challenge of demonstrating effectiveness of intervention for individual children when programs are implemented with class groups. They describe how they have used Systematic Analysis of Language Samples (SALT) to measure the progress of both individuals and groups (class or school) as well as to identify future goals of intervention.

Ziegenfusz, Coughlan, Paynter, Simpson and Westerveld continue the theme of demonstrating effectiveness of intervention for children with DLD with their retrospective analysis of the language outcomes of children who had attended a language specialist school over a ten-year period.

Given the amount of change in the area of DLD in recent times, the "Around the journals" column may be of particular interest. This column, by Emily Dawes, provides a summary of some recent key publications in the area, including the work by Bishop and colleagues and the CATALISE Consortium.

The "What's the evidence" column by Natalie Munro and Cori Williams, considers the impact of nonverbal IQ on response to intervention in children with DLD. As you read through this column there are references to a number of recent key journal articles in the area of DLD, a number of which are free open access. The column also highlights the role for all of us in building the evidence for our intervention, beginning with single subject case studies with individual clients, and also the importance of clinicians and researchers working together to build our body of evidence.

This issue also includes two "Ethical conversations" columns on the theme of DLD submitted by the Speech Pathology Australia Ethics Board. Both these columns address the topic of diagnosis. The column by Donna Dancer, describes the experience of seeking diagnosis from the perspective of the concerned parent, and the impact speech-language pathologists can have on the families we work with. The column by Leitão, Baker and Nayton focuses on the impact diagnosis has on young people in upper high school. Leitão et al., use a case study to highlight how different diagnoses can lead to different considerations being available to students in their exams in upper high school. The discrepancies described remind us of the role we have in advocating for our clients at different points in time.

As usual, our other columns give clinicians the opportunity to share new resources as well as old favourites; so do make sure to take the time to read these.

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Measuring language progress in students with developmental language disorder while attending a specialist school

A retrospective analysis

Shaun Ziegenfusz, Amanda Coughlan, Jessica Paynter, Kate Simpson, and Marleen F. Westerveld

Students with developmental language disorder (DLD) are at risk of long-term academic and socio-emotional challenges. Evaluating these students' progress on standardised measures following attendance at a language specialist school provides an opportunity to evaluate the impact of this model of service delivery on language progress.

A retrospective chart analysis was conducted of all students enrolled in a language specialist school between 2005 and 2015. There was a total of 64 students who completed a standardised language assessment on two occasions, one of which occurred upon enrolment.

Students were aged between 4 and 16 years at enrolment (M = 92.91 months). Students scored within the severe range consistent with expectations at Time 1 assessment. Significant improvements on standard scores were observed at Time 2 on receptive and expressive language scores. Time between assessments varied and was related to initial severity rather than progress over time.

As a group, students demonstrated significant improvement in language skills during their enrolment at the school. Clinical implications and future directions are discussed.

Language development for most children appears effortless. However, approximately 7 per cent of children will show persistent challenges known as developmental language disorder (DLD) (Bishop, Snowling, Thompson, Greenhalgh, & the CATALISE Consortium, 2017; Norbury et al., 2016). DLD is characterised by communication difficulties across form, content, and use, at word, sentence, and/or text levels (Bishop, Snowling, Thompson, Greenhalgh, & the CATALISE Consortium, 2016). Children with DLD form a heterogeneous population, with language profiles showing differing patterns of strengths, needs, and severity (Martínez, 2015). These language difficulties affect academic learning and persist into adolescence and adulthood (Catts, Hogan, & Adlof,

2005). Not surprisingly, DLD is known to increase the likelihood of unemployment and serious mental health problems (Clegg, Hollis, Mawhood, & Rutter, 2005; Johnson, Beitchman, & Brownlie, 2010). Further, there is a significant impact on the economy, as there is greater utilisation of health care by children with DLD relative to typically developing peers (Cronin, Reeve, McCabe, Viney, & Goodall, 2017; Le et al., 2016). Taken together, there is a clear need to better understand the developmental trajectories of children with DLD who receive specialised services. The present study aims to address this issue through retrospective chart analysis of language progress for a cohort of students with DLD who attended a language specialist school.

Standardised norm-referenced language assessments, such as the Clinical Evaluation of Language Fundamentals (CELF-4; Semel, Wiig, & Secord, 2006), are frequently used to evaluate children's language delays to inform DLD diagnosis (Betz, Eickhoff, & Sullivan, 2013; Bishop et al., 2016). Children with DLD display persistent low performance on such assessments in comparison to their typically developing peers in population studies (Tomblin, Zhang, Buckwalter, & O'Brien, 2003) and standard scores tend to be stable over time (Conti-Ramsden, St Clair, Pickles, & Durkin, 2012; Rice, 2013). Regression of language performance is rarely observed and is more commonly associated with other developmental disorders (Pickles et al., 2009). Likewise, longitudinal studies have failed to show accelerated growth in language performance after entering school. For example, Conti-Ramsden et al. (2012) evaluated the developmental trajectories of receptive language, expressive language, and non-verbal skills in school-age children with a history of DLD. Results showed that overall the children demonstrated consistent standardised scores on expressive and receptive language over a 10-year time period. Thus, while children with DLD continue to develop their language skills (as shown in raw score improvements), the gap between achieved skills compared to typically developing peers (standard scores) persists over time. More recently, McKean et al. (2017) identified variability in trajectories for language growth between 7 and 11 years. While the majority of children in the study (94%) demonstrated a stable trajectory during this time period, a small percentage of children's language scores decreased (4%) while others increased (2%). Despite the mean trajectory of the stable group being flat, individual variability in the rate of progress showed language skills improved over time.

Shaun Ziegenfusz (top), Amanda Coughlan (centre) and Jessica Paynter,

Research into the effectiveness of treatment aimed at remediating language difficulties is critical, considering both the pervasive and significant impact of DLD on the individual (e.g., Johnson et al., 2010) and the potential for treatments to accelerate language progress. Speech-language pathologists (SLPs) provide a range of direct and indirect models of service for children with DLD, including individual, small group, classroom support, and consultation in clinical, school or home settings (Gallagher & Chiat, 2009). There is some support for the effectiveness of speech and language therapy for children and adolescents with DLD; however, it remains unclear as to the frequency and dosage of treatment required to observe improvement (Boyle, McCartney, O'Hare, & Law, 2010; Ebbels et al., 2017; Law, Garrett, & Nye, 2004). School-age children with DLD often attend educational settings with typically developing peers, though specialised intervention services have also been established, such as language units and schools. Researching students with DLD who attend specialised services provides an opportunity to evaluate whether this model of service delivery maintains and/or accelerates language progress (Ebbels et al., 2017).

In Queensland, Australia, there is a language specialist school for students with DLD. The school offers a multidisciplinary program from prep (first year of school) to year 12 that aims to improve educational and therapeutic outcomes for students with DLD. Staff include teachers, SLPs, occupational therapists, psychologist, physiotherapist, music therapist and support staff. The multidisciplinary team implement the national curriculum within multi-age classrooms with integrated intervention from therapists to facilitate access to learning. This intervention is targeted at a whole class, small group and/or individual basis depending on the goals of each student. There is an overall focus on developing language skills (e.g., semantics, syntax, morphology, pragmatics) within a holistic, educational framework.

To date no published systematic evaluation of language progress has been conducted at the specialist school. Therefore, this retrospective study was undertaken to understand the language progress of students following attendance. This would help enable the school to examine outcomes, as well as to plan for future evaluations of potential ingredients of the service that effect change and the mechanisms by which they take effect (Turkstra, Norman, Whyte, Dijkers, & Hart, 2016). The study aimed to address the following question:

Do students with DLD demonstrate improvement in receptive and/or expressive language skills on the CELF following attendance at a language specialist school?

Kate Simpson (top) and Marleen F. Westerveld

Given the specialist nature of the school, it was expected the students entered the school with significant language difficulties as measured on the CELF (Semel, Wiig, & Secord, 2006). Based on previous research, it was anticipated that the overall cohort would demonstrate stable progress over time (i.e., consistent standard scores) with some individual variability, but remain in the impaired range (Conti-Ramsden et al., 2012; McKean et al., 2017).

Method

Setting
Standardised language assessments were regularly completed at the school, as a requirement of educational funding. The school caters specifically for students with DLD, that is, performance below two standard deviations on a standardised, omnibus language assessment, and a non-verbal IQ greater than 70, with no sensory impairment or medical diagnosis (such as hearing impairment) that would better account for the impairment. The records were maintained by the school during enrolment and archived following the student's departure. The school's research committee supported the study and Griffith University's Research Ethics committee deemed retrospective analysis of de-identified data extracted from charts as exempt from ethical approval, as reflected in the university's ethical guidelines.

Procedure
The electronic and physical records of all students enrolled in the school between 2005 and 2015 were examined. The demographics and previous assessment data were then extracted by school personnel and de-identified.

Participants
Data from a total of 245 (190 males and 55 females) students' records were initially extracted. Inclusion criteria for the present study included available records for CELF-4 (Semel, Wiig, & Secord, 2006) or CELF-P2 (Wiig, Secord, & Semel, 2004) at two time points. Time 1 was at enrolment; Time 2 was a follow-up assessment, which varied due to educational funding requirements or exit from school. The CELF Core Language standard scores were available for 171 students at Time 1 and 64 students at Time 2. As shown in Table 1, the data available for the 64 students were found to be representative of the broader group in terms of age, mothers' education (as reported on the enrolment questionnaire developed by the school), and language ability (all *p*'s > .05); however, there was a significant difference in the ratio of males to females between the two groups, with the included group showing a higher ratio of males: females than the excluded group.

Table 1. Student demographics					
Demographic variable	Included (*n* = 64) Mean (SD)	Excluded (*n* = 107) Mean (SD)	*t* (df)	*p*	Cohen's *d*
Age in months	92.91 (32.44)	99.60 (40.99)	1.101 (161)	.273	−.182
CELF-Core language range	57.0 (13.1) 40 - 89	58.5 (14.3) 40 - 94	.702 (165)	.483	−.109
			χ^2 (df)	*p*	Cramer's V (φ)
Gender M/F	56/8	78/29	5.036 (1)	.025	.145
Mother's education – post-high school qualification Y/N	41/14	62/15	.668 (1)	.414	.199

Table 2. Outcomes					
Measure	Time 1 Mean (SD)	Time 2 Mean (SD)	t (df)	p	Cohen's d
Age in months	92.91 (32.44)	124.73 (40.30)	13.03 (63)	< .001	−.87
Core Language (n = 62)	56.71 (13.11)	59.61 (14.76)	1.92 (61)	.059	.25
Receptive Language (n = 57)	63.92 (10.19)	68.61 (15.55)	2.85 (56)	.006**	.41
Expressive Language (n = 64)	58.37 (11.12)	61.09 (13.09)	2.12 (63)	.038*	.27

Note. All CELF scores reported as standard scores. Number of participants varied due to missing data at either Time 1 or Time 2. **$p < .01$; *$p < .05$

Measures

Administration of CELF

The CELF-P2 was administered to students entering the school under the age of 5 with the CELF-4 as a follow-up at Time 2 based on assessment age ranges. CELF-P2 and CELF-4 show moderate to high correlations for composite scores (0.68–0.84), suggesting the two assessments measure similar constructs (Wiig et al., 2004) and validity of comparisons over time.

CELF-4

CELF-4 is a clinician-administered norm-referenced assessment for individuals aged 5;0–21;11 years. It includes 18 subtests, which yield index scores with the Core Language, Receptive Language, and Expressive Language standard scores ($M = 100$, $SD = 15$) used in the present study. It shows strong psychometric properties in the Australian standardisation, including test-retest reliability (0.77–0.94), internal consistency (0.70–0.92), and inter-scorer reliability (0.99–1.0) (Semel et al., 2006).

CELF-P2

CELF-2 is a clinician-administered norm-referenced assessment administered by clinicians for individuals aged 3;0–6;11 years. It includes 11 subtests, which yield index scores with the Core Language, Receptive Language and Expressive Language standard scores ($M = 100$, $SD = 15$) used in the present study. It shows strong psychometric properties in the Australian standardisation, including test-retest reliability (0.91–0.94), internal consistency (0.72–0.96), and inter-scorer reliability (0.98–1.0) (Wiig et al., 2004).

Results

Data were screened for meeting the assumptions of parametric analysis; one influential outlier was found on Receptive Language and was thus excluded from further analysis. No deviations from normality were observed. At Time 1, 51 students had been assessed using CELF-4 and 13 students had been assessed using CELF-P2. All students were assessed using CELF-4 at Time 2. Screening for missing data found < 5% missing, which was missing completely at random (Little's MCAR test, $\chi^2 (38) = 30.6$, $p = .81$), thus data were excluded listwise as is acceptable under these conditions (Tabachnick & Fidell, 2013). Effect sizes are presented using Cohen's d (Cohen, 1988), with $d = 0.2$ considered a "small", 0.5 a "medium", and 0.8 a "large" effect size.

At Time 1, students were aged between 50 and 193 months with a mean age of 92.91 months (7 years; 9 months), and there were 8 females and 56 males (see Table 1). More mothers had completed tertiary qualification (41) than not (14). Performance on the CELF using the Core

Language standard scores ranged from 40 to 89 with the mean (SS 57) falling in the severe range. Analysis using Pearson's r showed there was no significant correlation between severity of language impairment and age of enrolment ($r = .167$).

Changes from Time 1 to Time 2 were analysed using repeated measures t-tests; see Table 2. Students showed significant improvement in Receptive Language over time, with a mean improvement of five standard score points, with a small–medium effect size ($p = .006$, d = 0.41). Significant improvements in Expressive Language were also observed with a small effect size ($p = .038$, $d = 0.27$). A trend in the expected direction was seen in Core Language, which approached significance with a small effect size ($p = .059$, $d = 0.25$). Table 2 also lists the results.

The mean age was 92.91 months (SD = 32.44) at Time 1 and 124.73 months (SD = 40.30) at Time 2 assessments with a mean time of 31.78 months (SD = 19.64, range 12–99 months) between assessments. Time between assessments was not related to change (Time 2 – Time 1 CELF score) in Core Language ($r = .215$, $p = .093$), Receptive Language ($r = −.219$, $p = .098$), or Expressive Language ($r = .080$, $p = .53$). However, time between assessments was significantly related to greater impairment in Core Language ($r = −.307$, $p = .015$) and Expressive Language ($r = −.280$, $p = .025$), but not Receptive Language ($r = −.209$, $p = .107$) at Time 1. Age at Time 1 or Time 2 assessment was not significantly related to change in scores (all $p > .05$). Scores at Time 1 assessment were not significantly related to change in CELF scores for Expressive Language ($r = −.17$, $p = .18$), or Core Language ($r = −.22$, $p = .09$). However, a trend towards significance for Receptive Language ($r = −.27$, $p = .051$) where lower intake scores were associated with greater change over time was observed.

Discussion

The aim of the study was to determine if students with DLD demonstrate improvement in receptive and/or expressive language skills on a standardised assessment following attendance at the language specialist school. Our results showed significant improvement in the cohort's receptive and expressive language during their enrolment at the school. This finding is consistent with previous studies that children with DLD show ongoing development of their language skills (McKean et al., 2017), but continue to perform significantly below the level of their typically developing peers over time, as evidenced by CELF scores continuing in the severely impaired range (Conti-Ramsden et al., 2012; Tomblin et al., 2003). Our results also showed some evidence of accelerated improvement, albeit with a small effect, between Time 1 to Time 2. These results are promising and provide some initial evidence of the

effectiveness of the language specialist school in promoting language growth in their students. It is noteworthy that the cohort improved more significantly in receptive language than expressive language, as it has been well established that improvement in receptive language in children with DLD is difficult to achieve (Law, Garrett, & Nye, 2004; Ebbels, Marić, Murphy, and Turner, 2014). However, further research is clearly needed to understand which students benefit most from services provided by the language specialist school, and better understand which aspects of the interventions provided in the specialist school lead to these improvements.

Although the current study did not set out to address these issues, it was interesting to note the wide range of age at enrolment. This may indicate that not all children receive a diagnosis and/or specialised support in the early years of schooling. Inspection of the data did not reveal a significant correlation between severity of language impairment and age of enrolment. Future enrolment interviews could explore the reasons parents may have for seeking support from a specialist school at a particular time of the student's academic career and whether it links to time of diagnosis (Lyons et al., 2008). Further analysis demonstrated time between assessments was related to severity at Time 1, but not to changes over time. As assessments were typically conducted to inform exit from the school, or funding if exit did not occur, this finding suggests that students with a higher level of initial severity are likely to remain at the school for a longer period. Results also suggest these students are associated with greater change in scores, which may be due to greater scope for growth. This is a promising finding and suggests those with greatest needs may benefit most; however, this result requires replication in future research. Further, research is needed to understand the intensity and duration of school placement to achieve optimal outcomes for children.

Limitations and future directions

This study provides initial evidence for the effectiveness of a language specialist school in supporting the language progress of students with DLD. However, a number of limitations are acknowledged. First, although the data for 245 students could be retrieved, only 64 students could be included in this study. This sample size precluded more fine-grained analysis of subgroups which would be a valuable step in the future. Further, a larger sample size would allow sufficient power to detect smaller effects. For example, changes in Core Language over time approached significance in the present study, but showed a small effect. The reduced sample size was due to challenges accessing stored records and to significant inconsistencies in initial data collection processes. Although the included cohort of 64 did not differ from the bigger group on age, language levels, or maternal education, there were significantly more males than females in the cohort compared to the excluded students, which affects the generalisability of the results.

Another limitation relates to the administration of the CELF-P2 (rather than CELF-4) for some students at Time 1. This is tempered somewhat by the fact that there is a moderate to high correlation between the measures, as reported in the test manual, and both report similar composite scores. Further, the CELF was administered for funding purposes, rather than for research protocols, which resulted in a wide range of administration time periods by non-blind assessors. However, the assessments were completed by experienced certified practising SLPs who completed assessments as part of the program, without the knowledge of their use to evaluate language progress. Of course, without a control group of students who did not attend a language specialist school, or specific details of treatment provided, we cannot make definitive statements regarding the reasons for significant improvements in expressive and receptive language skills.

Finally, this study relied on retrospective results from a decontextualised standardised language assessment to measure progress in language development and we acknowledge the importance of appraising students' language performance in more naturalistic discourse contexts (Westerveld, 2011). Despite these limitations, the study utilises data previously untapped for evaluating the language progress of students with DLD who attend a specialist school. Taken together, there is a clear need for future research to identify and refine the essential components of the language specialist school model of service delivery for students with DLD.

Conclusion

Considering the high incidence and lifelong impact of DLD, the importance of investigating models of service delivery is crucial to understand how best to promote language growth through treatment (Gallagher & Chiat, 2009). This retrospective chart analysis yields promising evidence of the effectiveness of a language specialist school in supporting the language development of students with DLD and preliminary proof of the potential benefits of this service delivery model. There is a clear need to further investigate the interplay between education and therapy in providing support in specialised environments. This study provides a first step for the language specialist school to systematically investigate (a) the specific language targets intended to change as a result of treatment; (b) the ingredients needed to effect change; and (c) the mechanisms of action by which the ingredients take their effect (Turkstra et al., 2016). Future research into language specialist schools will be invaluable to understand optimal support and intervention to accelerate language progress in students with DLD.

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The clinical application of SALT to evaluate intervention program effectiveness in a school context

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THIS ARTICLE HAS BEEN PEER-REVIEWED

Samuel Calder (top), Robert Wells (centre) and Laura Glisson

Language sample analysis (LSA) is highly recommended in the literature as a clinical tool for diagnosis, goal-setting and measuring effectiveness. This paper describes a project undertaken by a team of speech-language pathologists in a school context, whereby language samples of a narrative retell task from 91 children with developmental language disorder (DLD) were analysed using systematic analysis of language transcription (SALT) at two testing points. This was done in an effort to streamline usual narrative analysis processes and to evaluate the effectiveness of whole school narrative programming. Children's linguistic performance on narrative macrostructure and microstructure measures, and suggestions for future directions are discussed. Conclusions from the project suggest SALT is a valuable clinical tool for evaluating intervention program effectiveness that is transferable to the school context.

Developmental language disorder (DLD) affects approximately 7 per cent of the population (Norbury et al., 2016). Children with DLD experience language difficulties in the absence of sensory impairment or intellectual disability (Bishop, Snowling, Thompson, Greenhalgh, & and the CATALISE Consortium, 2017). In Perth, Western Australia, children with DLD may be offered an educational placement in one of five language development centres (LDCs). LDC speech-language pathologists (SLPs) and teachers work together to develop students' skills and knowledge across the curriculum.

The Western Australian curriculum places great emphasis on classroom teaching of narrative skills. From kindergarten to year 6, the School Curriculum and Standards Authority (2016) states that children are expected to demonstrate understanding and use of text structure and organisation, including "how texts serve different purposes and how the structures of types of texts vary according to the text purpose" (p. 2), and "how texts work as cohesive wholes through language features that link parts of the

text together, such as paragraphs, connectives, nouns and associated pronouns" (p. 2). These definitions reflect aspects of narrative macrostructure (the rule-governed way episodes of text are organised at discourse level) and microstructure (the cohesive linguistic devices that link macro-elements), respectively. It is believed that narrative language serves as a bridge between oral and literate language (Westby, 1985) as it supports young language learners to move from contextualised to decontextualised language use necessary for academic performance. Further, academic success is predicted by narrative performance (Bishop & Edmundson, 1987). Therefore, a focus on teaching oral narrative directly and explicitly is necessary in a classroom context for young school-aged children, especially those with language difficulties.

It has been well documented that school-aged children with DLD have more difficulty in narrative comprehension and generation than their typically developing peers, and have been found to produce narratives that are less developed in story grammar, with a reduced range of vocabulary and less complex syntax (Fey, Catts, Proctor-Williams, Tomblin, & Zhang, 2004). Children with DLD present with macrostructure errors including incorrect or illogical sequencing of events, omission of story elements, and reduced length of narratives (Petersen, 2010). Microstructure errors such as in grammar, reduced sentence complexity, incorrect word selection and reduced lexical diversity may also be present (Hayward & Schneider, 2000).

A responsiveness to intervention (RTI) model is useful to describe narrative intervention to address such difficulties (Gillam & Justice, 2010). RTI is often conceptualised as a framework of instructional support that uses a tiered approach: tier 1 (whole class); tier 2 (small group); and tier 3 (individual), where at the LDC, SLPs have a role of developing and implementing intervention across all tiers. There is evidence to suggest that narrative intervention is effective at improving language performance in broad tier 1 intervention over as little as four weeks (Spencer, Petersen, Slocum & Allen, 2014), for culturally diverse preschool aged children (Petersen & Spencer, 2016), as well as specifically for children with DLD in the classroom and in small groups (Petersen, 2010; Gillam, Gillam & Reece, 2012; Spencer et al., 2014).

Within LDCs, an evidence-based approach is taken to delivering narrative intervention with procedures replicating those described in the research literature. These intervention procedures form the foundation of language

intervention for students with DLD from kindergarten to year 2. SLPs work with teachers to deliver classroom-based, small-group and individual intervention within an RTI model. Narrative-based language intervention generally occurs daily, for between 20–60 minutes, depending on the age of the students. Narrative comprehension and expression skills are taught within an explicit teaching framework and are included in intervention procedures in the studies detailed above. Lennox, Westerveld and Trembath (2016) reported on the effectiveness of a classroom-based intervention to improve literacy performance for at-risk preschool-aged students using a similar approach to that implemented at the LDC. The authors found positive effects for oral language performance following 24 weeks of tier 1 intervention.

To ensure the provision of evidence-based practice, it is vital to monitor ongoing program effectiveness. Common narrative elicitation techniques used across studies in a recent systematic review of intervention literature (Petersen, 2010) included repeated telling and/or generating narratives using single pictures/photos, wordless picture books and/or picture drawings to elicit narratives. Specific aspects of narrative language performance gathered through these means can be evaluated using measures available through systematic analysis of language transcripts (SALT; Miller, Gillon & Westerveld, 2015), such as number of different words (NDW) and mean length of utterance (MLU). Calder et al. (2017) previously discussed a process for using SALT as a method for analysing expressive language performance in a narrative context which is useful for establishing baseline data and planning intervention. The aim of this current paper is to report on the evaluation of the effectiveness of a classroom based narrative intervention program using the same procedures by comparing narrative performance of a cohort of students from 2015 to 2016.

The research hypotheses are:
1. Following a year of classroom based narrative intervention, year 1 and 2 students with DLD will demonstrate significant improvement on narrative macrostructure measures (setting, character, initiating event, internal response, plan, actions, complication, solution, and consequence).
2. Following a year of classroom based narrative intervention, year 1 and 2 students with DLD will demonstrate significant improvement on narrative microstructure measures (MLU, NDW, percentage of maze words, conjunctions, adverbials, and word level errors).

Method
Ethics
Ethics approval for this project was obtained from Curtin University (HRE2016-0047) and the Department of Education, Western Australia.

Participants
Participants were 91 children with developmental language disorder (DLD); 64 children entering pre-primary (5;11–6;7 years) and 27 beginning year 1 (6;11–7;4 years). All children attended the same LDC, in the Perth metropolitan area. All children were diagnosed as having DLD based on formal and informal assessment including the *Clinical Evaluation of Language Fundamentals-Preschool* (Wiig, Secord, & Semel, 2004). All children demonstrated sound adaptive behaviour and average or above-average non-verbal skills to

differentiate students from those that may have a global developmental delay, as determined by a referring psychologist. These factors combined are considered evidence of a diagnosis for DLD (Bishop, Snowling, Thompson, Greenhalgh, & the CATALISE Consortium, 2016).

Data collection tools and procedures
Narrative samples were collected from all participants in term 4 of 2015 prior to intervention in 2016 using the wordless picture book *Peter and the Cat* (Leitão & Allan, 2003). Children listened to the story while looking at the pictures. Children were then required to retell the story using the pictures as visual prompts. *Peter and the Cat* (Leitão & Allan, 2003) contains all key macrostructure elements (Stein & Glenn, 1979).

Narrative intervention blocks at the LDC typically begin with a whole-class book share, incorporating a "before, during and after" reading process focused on: a) activating prior knowledge of the story or theme within the book, b) completing a picture walk to support predicting and development of vocabulary, c) sticking narrative macrostructure icons into the book as elements are revealed during the read through, and d) completing a brief oral discussion of the book, focusing on recalling narrative macrostructure elements. Following this initial read through, the whole class listens to and is encouraged to join in with the reading of the book daily for two to four weeks, at the beginning of each narrative lesson. Intervention activities related to the narrative are then completed in small group rotations led by the teacher or education assistant or independently.

Intervention activities used in this study included sequencing of pictures from the narrative and creating story boards, explicit targeted lessons on the macrostructure elements of the story (e.g., character, setting or central plot), group choral retells of the story using a story board or story map, and individual oral retells of the story with visual support. Additional activities focused on semantic organisation and vocabulary, grammar, and comprehension related to the text were also included throughout the two-to four-week period.

Following one year of intervention, all participants were re-assessed using *Peter and the Cat* in term 4 of 2016. The same procedure was followed to collect narrative samples. See Table 1 for a breakdown of assessment schedule.

Cindy Stirling (top) and Mary Claessen

Table 1. Assessment time points and number of students from 2015 to 2016	
Term 4, 2015	**Term 4, 2016**
64 pre-primary students	64 year 1 students
27 year 1 students	27 year 2 students

All language samples were audio recorded and samples were transcribed verbatim by LDC classroom teachers. SLPs listened to the recorded samples and checked the teachers' transcription, which were edited accordingly.

Data analysis
Samples were segmented into c-units using SALT segmentation guidelines and analysed by SLPs using SALT *Research Version* software (Miller et al., 2015). All samples were coded in accordance with SALT coding guidelines in

order to allow for calculation of SALT standard measures including MLU, NDW, mazes, and error codes. Samples were also coded for presence of macrostructure elements; temporal and causal conjunctions; and, adverbials of time, place and manner. For each cohort, *SPSS Statistics 23* was used to compare samples collected from each student in 2015 to 2016. Scale measures (actions, MLU, NDW, percentage of maze words, conjunctions, adverbials and word level errors) were counted each time they appeared in each sample, while binary measures (setting, character, initiating event, internal response, plan, complication, solution, and consequence) were coded for presence (1) or absence (0). Statistical difference between 2015 and 2016 samples for parametric measures were analysed using paired-samples *t*-tests with a α level of .05. Probabilities of difference between 2015 and 2016 non-parametric measures were analysed using McNemar's Test of Change.

Results

Average total utterances for pre-primary in 2015 was 18.20 (sd = 5.118) complete and intelligible utterances, and 22.56 (sd = 6.00) for year 1s in 2016. Average total utterances for year 1 in 2015 was 19.93 (sd = 4.64) complete and intelligible utterances, and 19.74 (sd = 4.24) for year 2s in 2016.

Macrostructure

Differences in macrostructure for year 1 (*n* = 64) and year 2 (*n* = 27) participants are summarised in tables 2 and 3, respectively. Students included character, initiating event, internal response, actions and consequence in their narrative samples significantly more in 2016 than in 2015. Greater use of setting, plan and complication was seen in students' narrative samples in 2016 as compared to 2015; however, these differences were not statistically significant.

Microstructure

Differences in microstructure for year 1 (*n* = 64) and year 2 (*n* = 27) participants are summarised in tables 4 and 5, respectively. Year 1 students demonstrated a significant increase in MLU, NDW and connectors and a significant

decrease in usage of adverbials. All differences in microstructure for year 2 participants were non-significant, excepting a significant decrease in connectors.

Reliability

Interrater reliability of narrative sample transcription and coding was evaluated by calculating intraclass correlation coefficients (Cohen's kappa) for SALT measures and narrative macro- and microstructure codes (see Table 6). Guidelines for interpretation for kappa/ICC inter-rater agreement measures follows Cicchetti's (1994) recommendations: *poor* (< 0.40); *fair* (0.40–0.59); *good* (0.60–0.74), and *excellent* (0.75 and 1.00). We had excellent agreement for all the SALT standard codes, and for microstructure codes, but poor or fair agreement for macrostructure codes (with the exception of complication).

Table 3. Year 1 to year 2 change in macrostructure frequency scores and statistical significance

	Frequency 2015	Frequency 2016	Significance
Character	23	26	< .01***
Setting	9	20	.87
Initiating Event	22	27	< .01***
Internal Response	0	1	< .01***
Plan	13	25	.11
Actions	2.89 (*sd* = 1.40)	4.07 (*sd* = 1.74)	.02*
Complication	7	18	.87
Solution	22	27	.375
Consequence	17	27	.01**

Note. n = 27; *p* < .05; **p* < .01; ***p* < .001.

Table 2. Pre-primary to year 1 change in macrostructure frequency scores and statistical significance

	Frequency 2015	Frequency 2016	Significance
Character	50	62	< .01***
Setting	18	45	> .99
Initiating event	49	63	< .01***
Internal response	0	11	< .01***
Plan	13	41	.35
Actions	2.69 (*sd* = 1.64)	4.34 (*sd* = 2.14)	< .01***
Complication	17	48	> .99
Solution	36	28	< .01***
Consequence	29	58	.02*

Note. n = 64; *p* < .05; **p* < .01; ***p* < .001.

Table 4. Pre-primary to year 1 change in microstructure frequency scores and statistical significance

n = 64	Average 2015	Average 2016	Significance	Cohen's *d*
MLU	6.14 (1.20)	7.01 (1.10)	< .01***	.61
NDW	48.66 (16.71)	62.70 (16.71)	< .01***	.73
% Maze words	.83 (0.06)	.07 (0.05)	.18	.20
Error codes	7.86 (4.61)	8.55 (4.89)	.33	.12
Connectors	7.70 (5.11)	10.22 (4.45)	< .01***	.45
Adverbs	4.16 (2.50)	4.09 (0.79)	.88	.02

Note. n = 64; *p* < .05. **p* < .01. ***p* < .001.

Table 5. Year 1 to year 2 change in microstructure frequency scores and statistical significance

n = 27	Average 2015	Average 2016	Significance	Cohen's d
MLU	6.94 (1.20)	7.15 (1.35)	.44	.15
NDW	60.78 (15.93)	63.44 (14.00)	.34	.19
% Maze words	.10 (0.06)	.07 (0.05)	.84	3.46
Error codes	6.70 (4.95)	5.19 (4.20)	.59	.38
Connectors	11.26 (4.07)	8.93 (4.96)	.05*	.41
Adverbs	4.22 (2.60)	5.11 (2.67)	.17	.27

Note. n = 27; *p < .05; ** p < .01; ***p < .001.

Table 6. Reliability of transcription intraclass coefficient values

Feature	ICC/Cohen's χ	Interpretation
%MzWrds	.948	Excellent
ErrCodes	.923	Excellent
MLUm	.913	Excellent
NDW	.99	Excellent
Setting	.53	Fair
Character	.243	Poor
Initiating event	−.147	Poor
Internal response	−.07	Poor
Plan	.592	Fair
Actions	.488	Fair
Complication	.839	Excellent
Solution/resolution	.32	Poor
Consequence/tie-up	.356	Poor
Connectors	.762	Excellent
Adverbs	.838	Excellent

Discussion

This paper reports on the results of a tier 1 narrative intervention program delivered within the classroom in a school for children with DLD. As professionals, SLPs are charged with demonstrating treatment effectiveness in everyday clinical practice. Within specialised service delivery contexts, such as LDCs, SLPs are required to report on treatment effectiveness at both the individual student and cohort level. In such contexts, clinicians are faced with challenges in demonstrating effectiveness given the number of clients on the active caseload.

Ninety-one children with DLD received a narrative intervention program within their classrooms, delivered by teachers and SLPs. As hypothesised, significantly more children included appropriate characters, initiating events, internal responses, actions and consequences following intervention. While significant increases were not observed for setting, plan, solution and complications, this may be due to the nature of the intervention program, which focused mainly on the link between initiating event and internal response within the narratives. These elements are critical for improving knowledge of cause-and-effect relationships within story telling. This focus may have been at the expense of ensuring the use of other macrostructure elements were secure before progressing with intervention.

At a microstructure level, significant improvements were made in MLU, NDW, and number of connectors used between pre-primary (PP) and year 1, in line with hypothesis 2. Between year 1 and year 2 no significant differences were seen in percentage of maze words, error codes, or use of adverbials. Despite a significant increase in the number of the macrostructure measure of actions, a significant reduction in use of connectors was found alongside an increase in MLU. This may suggest that students were focusing on elaborating sentences (i.e., within simple sentence structures) rather than expanding sentences (i.e., to compound and complex sentences). Unfortunately, the coding system used in this project did not allow the evaluation of elaborated noun phrases (e.g., inclusion of noun modifiers) to explore this outcome further. Future intervention may need to focus on linking these sentences to others within the text to improve use of complex language at discourse level for this cohort. Nonetheless, in general, findings suggest narrative language is more elaborate with increased grammatical and semantic accuracy (e.g., fewer error codes) by the end of year 2. The use of SALT allowed clinicians to measure oral language change quantitatively using a narrative sampling context (*Peter and the Cat*) at a cohort level following tier 1 narrative intervention, which would have otherwise not been possible using the paper version of the task alone.

Results suggest that LDC students responded positively to evidence-based tier 1 narrative language intervention (Spencer et al., 2014; Petersen & Spencer, 2016). In future, more time may be spent encouraging the use of foundation elements, such as setting before progressing to more complex elements. Furthermore, focus is needed on understanding and use of the grammatical functions of structures such as adverbials in narrative discourse to further elaborate sentences, as well as connectors that may be used to expand sentences to improve narrative cohesion.

Limitations

This paper reports on the use of SALT in a school context to track student progress following tier 1 narrative intervention. Notwithstanding the large sample size of this study, there are limitations to the generalisability of the findings to contexts outside the LDC. First, student performance was unable to be referenced against norms for typically developing, age-matched speakers. Although this function exists in SALT, the reference database stimuli were not utilised in the current project. Similarly, performance was not evaluated against a control group, and therefore threats to external validity such as maturation or history effects must be considered. Further, randomisation of children to treatment versus control

groups would address possible selection bias but this was not possible within the current context and remains a challenge to clinicians working in a school setting. Finally, interrater reliability for standard SALT measures was *excellent* indicating that sample transcription according to SALT guidelines was followed closely by the SLP team. However, agreement was fair to poor for macrostructure codes, suggesting that more training is needed to build consensus on how these elements are coded. This presents a threat to internal validity, in that subjectivity in coding using the SALT protocol may have resulted in inconsistencies in scoring narrative samples. These are challenges likely to be faced by clinicians working in various service provider contexts outside of research, and therefore represent a realistic picture of service delivery and outcome measurement.

Future directions

There are many possible future directions following this preliminary study of using SALT to evaluate intervention effectiveness. The processes described for collecting data provide an opportunity for LDC SLPs to systematically progress through levels of evidence, from longitudinal studies to group comparison studies (e.g., Lennox, Westerveld, & Trembath, 2016), ultimately improving confidence in reporting program effectiveness (NHMRC, 2009). As such, the team will continue to collect year-end data to build a database of LDC students' narrative performance, using procedures described above and in Calder et al. (2017). These data may be used to evaluate effectiveness of programs at both cohort and the individual level. A more defined macrostructure coding system, such as the Monitoring Index of Scholarly Language (Gillam & Gillam, 2013; Gillam, Gillam, Fargo, Olszewski, & Segura, 2016) may also be used in future. This system uses a 0–3 scoring range so that performance can be analysed for the quality, not just quantity of included narrative elements. This would add value to the interpretation of current findings by assessing how well, not just how often, children are using narrative elements during retells.

Conclusion

The findings from this project in combination with those reported in Calder et al. (2017) suggest that SALT is a viable tool for intervention planning and evaluation at a cohort level for children with DLD receiving intervention at a class level (tier 1). Significant improvement in a range of narrative macrostructure measures was observed. Although the generalisability of these findings may be limited, this project contributes to the growing evidence base suggesting that narrative intervention is effective in improving expressive language of early school-aged children with DLD.

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Attitudes and experiences of SLP students from a pilot telehealth stuttering clinic

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Kate Bridgman (top), Keisha Pallathil (centre) and Nicole Ford

This pilot aimed to explore student speech-language pathology (SLP) experiences with telehealth service delivery during a clinical placement, and to capture attitudinal changes throughout the placement. Six speech pathology students completed their entry level placement at a university based clinic. Students delivered stuttering treatment to clients in-clinic and using telehealth. Students' experiences and attitudes toward these service delivery modes were documented at the beginning, mid-point and end of their placement. Questionnaires contained Likert scale and open-ended questions.

Overall, student SLP responses were positive. Five main themes emerged from student SLP responses: (a) challenges of working within a "virtual" environment; (b) student perspectives on self-management of anxiety; (c) different learning approaches; (d) ease of access to services; and (e) telehealth considerations. Outcomes from this pilot study support the implementation of various service delivery modes to enhance student SLPs' competency in emerging areas of clinical practice.

The 2030 Speech Pathology Australia Futures Report (SPA, 2016) forecasts significant changes in service delivery. Advances in technology will require future speech language pathologists (SLPs) to be proficient in a range of service delivery models, including telepractice. Speech Pathology Australia (2014) defines telepractice (also known as "telehealth") as "the application of telecommunications technology to deliver clinical services at a distance by linking clinician to client, caregiver, or any person(s) responsible for delivering care to the client, for the purposes of assessment, intervention, consultation and/or supervision" (p. 4). Services may be delivered via a range of methods including video conferencing, internet, store-and-forward devices, streaming media, and terrestrial and wireless communication (International Standardization Organisation, 2016).

Telehealth is considered an efficient and effective mode of service delivery (Lam et al., 2016) and is situated within the broader context of eHealth. According to the World Health Organization (WHO), eHealth embraces the use of information and communication technologies "in support of health and health-related fields, including health-care services, health surveillance, health literature, and health education, knowledge and research" (WHO, 2005) and is a growing mode of service provision designed to promote equity of access and efficiency of service delivery. In preparation for this, tertiary courses need to equip student SLPs with the required clinical skills for telehealth service models in addition to in-clinic (May & Erickson, 2014; Theodoros, 2014). Such direct and explicit training in service provision is also necessary to satisfy the requirements of Entry Level Competency-based Occupational Standards (CBOS) (SPA, 2011) in relation to planning, implementing and providing speech pathology services across a variety of service contexts and range of practice areas.

To date, the utilisation of telehealth technology by medical and health science students has been largely assumed due to their frequent personal use of technological devices (Lam et al., 2016; Rienits, Teuss, & Bonney, 2015). However, there is some evidence to suggest that despite being referred to as the "net generation" or "digital natives", students do not always naturally transfer social and personal use of technology into formal learning and professional environments (Margaryan, Littlejohn, & Vojt, 2011; Selwyn, 2009). Further, emerging evidence suggests that medical and health science students generally have little understanding of eHealth, and more specifically lack of experience of telehealth practices, due to limited professional exposure throughout their academic and clinical training (Lam et al., 2016; Rienits et al., 2015).

Researchers have started to explore student perspectives and experiences of telehealth (Bull, Dewar, Malvey, & Szalma, 2016; Glinkowski, Pawłowska, & Kozłowska, 2013; Lam et al., 2016). A recent survey of 420 Australian health science students indicated that student familiarity with personal technology does not necessarily translate to confidence or application in clinical settings (Lam et al., 2016). To illustrate, 85% of students reported that they used synchronous videoconferencing for social use, yet only 52% felt they would be confident using the same technology professionally. Further, 75% of students indicated they would require explicit training in videoconferencing for

professional use. However, this finding contradicts an earlier survey of 308 undergraduate nursing students across 10 Polish universities which indicated that over two-thirds of students anticipated using telehealth in their careers (Glinkowski et al., 2013). In the latter study, 70% of respondents agreed that explicit teaching of telehealth service delivery should be embedded within their course. Interestingly, the universities with the highest student acceptance of telehealth were those that had been exposed to regional telehealth initiatives. As a result of this experience students were able to recognise and appreciate advantages to a telehealth service models. For example, 90% of nursing students in the study by Glinkowski et al., (2013) identified some benefits associated with telehealth including reduced costs, increased access to health care, and enhanced clinical efficiency. Similarly, when the perceptions of 315 American undergraduate psychology students toward telehealth were explored via a qualitative survey (Bull, Dewar, Malvey & Szalma, 2016), they too reported perceived advantages to telehealth including increased efficiency, convenience and enhanced access to consumers. However, participants in this study also raised potential disadvantages of this service delivery model relating to privacy and security of information, technical difficulties and the impersonal nature of interaction over a technological interface. Such insights are important when considering the attitudes and perceptions of future telehealth users as well as the design of telehealth service offerings.

Clinical placements are an integral component of most preparatory courses in the health and allied health sector, including speech language pathology. Qualified allied health practitioners report that clinical placements are essential for developing student's clinical skills and shaping their early career choices (Maidment, 2010). In medical contexts also, direct exposure to and development of telehealth skills within clinical settings has been shown to have a significant effect on students' confidence and understanding of issues and processes specific to telehealth (Rienits et al., 2015).

Experience delivering telehealth services during clinical placements appears proportionate to the variable engagement and attitudes of practicing clinicians (Glinkowski et al., 2013; Theodoros, 2011). In 2016, a systematic review of the literature explored the current barriers to global use of telehealth in nursing and allied heath, of which there were a number (Kruse et al., 2016). Context barriers appeared to be specific to the country and/or organisation in which the study was conducted and included factors such as persuading stakeholders that telehealth is a worthy investment and viable service model; and that staff and patients can develop the required skills. Person barriers related to clinic, staff and programmer views and attitudes, while patient related barriers included age and level of telehealth exposure and education. Overall, the review found staff technical skills, resistance to change, cost and reimbursement were barriers that affected implementation of telehealth services.

In speech-language pathology it has long been reported that SLPs themselves can be a barrier to telehealth service delivery (Mashima & Doarn, 2008). An Australian study involving 18 speech language pathologists (May & Erikson, 2014) identified four major barriers to use of telehealth: (a) lack of knowledge and understanding; (b) lack of training; (c) misconception held by metropolitan SLPs that telehealth is a rural service delivery option only; and (d) health organisations' policies regarding various service delivery models. To further enhance future SLP adoption and implementation of telehealth services, university courses need to ensure inclusion of the growing body of evidence for telehealth speech pathology practices in curricula, together with direct training and telehealth practicums (Theodoros, 2011). Such pedagogical changes can result in a positive change of attitude towards telehealth and the emergence of "telehealth champions" as these new graduates are recruited and begin to influence positive change in the workforce (Theodoros, 2011). Such graduates will indeed be the influencers of SLP practice as we approach 2030 and beyond.

Within the field of stuttering research, randomised controlled trials have demonstrated the efficacy of telehealth delivery of interventions (Bridgman, Onslow, O'Brian, Jones & Block, 2016; Carey, O'Brian, Onslow, Block, Jones & Packman, 2010; Carey, O'Brian, Onslow, Lowe & Onslow, 2014). Studies have also examined the experiences and outcomes of student SLP led stuttering interventions delivered in-clinic (Block, Onslow, Packman, Gray, & Dacakis, 2005; Cardell & Hill, 2013; Cocomazzo et al., 2012). However, there appear to be no studies exploring student SLPs experiences of delivering stuttering intervention via telehealth. Nor have there been any investigations to date of students' knowledge of how to establish policies and protocols around telehealth practice. These skills are essential for future practice, as existing services will need to adapt their practice policies to include alternative methods of service delivery.

The aim of this current study was to establish and pilot a stuttering service within an Australian university clinic, offering both in-clinic and telehealth service delivery options. As part of the feasibility analysis, attitudes and experiences of student SLPs toward delivering stuttering treatment via each of these modalities were compared.

Method
Placement design
A 20-day entry level placement was designed in which SLP students were provided with the opportunity to deliver stuttering intervention via telehealth and in-clinic within a Victorian university. Students were supervised by a qualified SLP and were allocated to the placement as per standard university clinical placement procedures.

Placement participants
SLP students
Six SLP students in their final year of study undertook the 20-day placement during a 12-week time period, attending 1–2 days each week. All students had previous clinical placement experience within traditional clinical settings; however, none had any telehealth experience. Student demographics were comparable with the group being similar in age, gender and overall academic ability. Prior to the placement, the students received a 1-hour lecture on telehealth delivery of stuttering interventions. Knowledge of stuttering assessment, intervention and outcome measurement was assumed from having successfully completed an academic unit in stuttering. Over the course of the placement all six SLP students had the opportunity to conduct the stuttering intervention both via telehealth and in-clinic. Students worked in pairs and each pair was allocated at least one telehealth and one in-clinic client at the beginning of the placement.

Top to bottom: Joanne Tran, Di-Luu Lam, Evelyn Wee, and Elaina Kefalianos

Clients

Over the course of the placement nine clients self-referred to the clinic seeking stuttering treatment. Eight were adolescents or adults and one was a school-aged child. The clients lived in metropolitan or regional areas of Victoria, interstate or overseas. Each client was given the option of receiving intervention via telehealth or within the clinic. Five clients elected to receive treatment via telehealth using Skype™, while the remaining four clients elected to receive treatment in clinic. Adults and adolescents received prolonged speech treatment and the school-aged child received syllable-timed speech intervention. Clients who had received treatment before requested continuance of the same treatment program, i.e., Smooth Speech or Camperdown Program.

Ethical considerations

The purpose of this evaluation was to establish and assess the feasibility of a new service initiative. Student SLPs were invited to contribute to the evaluation of the service as co-collaborators and did so with full understanding that participation was voluntary and that participation/non-participation in the evaluation would not influence the supervisor's assessment of individual performance while on placement. No client perspectives were sought during this phase of the service evaluation.

Data collection

Student SLP questionnaires

Each student SLP was asked to complete a questionnaire at the end of their first placement day, mid-placement and on their final placement day. The questionnaire contained nine Likert-scale questions and six open-ended questions about their experiences of telehealth and in-clinic service delivery models. All students completed the survey at each time point anonymously and independently. The supervising SLP (clinical educator) was not present as the surveys were completed. Responses were stored securely and not opened or read until the placement had concluded and students had received appraisal of their performance. Each questionnaire contained an opt-in statement for the student SLP to "consent to this data being used in presentations or papers relating to this clinic". All six students provided written consent for their anonymous responses to be analysed and reported in appropriate forums.

Quantitative data

Likert-scale questions were presented on a 5-point continuum, with 1 representing *totally disagree*, 2 *disagree*, 3 *neither agree nor disagree*, 4 *agree*, and 5 *totally agree*. Due to the small sample size, descriptive statistics were used to identify potential trends across the three evaluation time points.

Qualitative data

Student SLP answered the following six open-ended questions at each time point and responses were collated and analysed thematically:

1. What is the best thing about IN-CLINIC treatment sessions for you as a student clinician?
2. What is the worst thing about IN-CLINIC treatment sessions for you as a student clinician?
3. Any other comments?
4. What is the best thing about TELEHEALTH treatment sessions for you as a student clinician?
5. What is the worst thing about TELEHEALTH treatment sessions for you as a student clinician?
6. Any other comments?

Responses were read by the first author and annotated to note initial patterns. A more in-depth analysis of the responses was then conducted line-by-line to identify concepts that formed the basic units, or "codes" of the analysis. Codes were then sorted into themes and subthemes. An iterative process was used to review the overarching themes to ensure their internal and external homogeneity (Braun & Clarke, 2006). Themes were reviewed by the first, second and final author and any discrepancies in interpretation discussed until consensus was reached. Student SLPs also participated in member checking of the thematic analysis to validate and refine the interpretation of the data.

Results

Quantitative results

Student responses to Likert-scale questions were collected at three time points but responses for some questions could only be compared pre- and post-placement or mid- and post-placement due to the nature of the question. For example, some students were unable to answer questions relating to specific clinical experiences at the beginning of their placement, as they had not participated in any sessions yet. By the end of the placement students reported a very high level of agreement with statements pertaining to establishing client rapport, delivering assessment and treatment, and satisfaction with their overall learning experiences across both the telehealth and in-clinic delivery models. Table 1 provides a summary of mean scores for in-clinic and telehealth treatment experiences across the placement.

In terms of preference for a particular service delivery model, at pre-placement four of the six students indicated that they did not have a preference for either in-clinic or telehealth service delivery. The remaining two students expressed a preference for in-clinic service delivery. By the end of placement, five out of six student SLPs did not express a preference for either in-clinic or telehealth service delivery, while the sixth student expressed a preference for telehealth service delivery. Thus, the students who preferred in-clinic service at placement commencement changed their preference by the end of the placement, suggesting that attitudes towards service delivery can change, once the service delivery method has been directly experienced. Figure 1 illustrates these trends.

Qualitative results

Overall, five main themes emerged from analysis of the students' responses to the open-ended questions about their attitudes and experiences of delivering intervention by telehealth or in-clinic. Figure 2 depicts the relationship between themes and subthemes.

Theme 1: Challenges of working within a "virtual" environment

The first theme that emerged was recognition of the different dynamic established between the student SLPs and clients across the two service delivery modes. In all surveys, students reported it was easier to build rapport with clients in-clinic as compared to via the telehealth mode, with one student reporting that "I feel it may be easier building relationships in person than over Skype". The students reported that engaging with clients in person made it easier to read and use body language cues to facilitate communication and rapport. Students found the lack of visual information over the telehealth challenging in this regard. One student explained that "It is hard to build rapport without additional communication features such as body language". In in-clinic contexts it was also easier to

Table 1: Student SLP attitudes towards in-clinic and telehealth service delivery at the beginning, mid, and end of clinical placement*.

Statement	Beginning	Mid (n = 6)	End (n = 6)
In-clinic			
Overall I have been able to establish and maintain rapport with my clients during sessions	4.5	5	5
Overall I have been able to complete assessment sessions adequately	4 (n = 3)	5	5
Overall I have been able to complete treatment sessions adequately	4 (n = 1)	4.8	4.8
The CE was provided me assistance, suggestions or support during the sessions	3.8 (n = 2)	4.8	5
If so, CE assistance or support during sessions assisted me positively during sessions.	4 (n = 4)	4.8	5
The clients generally address the student clinician/s during the session most of the time	4 (n = 4)	4.7	4.8
I would feel confident using telehealth in the future			
I feel having telehealth experience places me at an advantage when applying for jobs			
I would recommend a telehealth clinical education experience for future students			
Telehealth			
Overall I have been able to establish and maintain rapport with my clients during sessions	3.8 (n = 5)	5	5
Overall I have been able to complete assessment sessions adequately	3.6 (n = 4)	4.8	4.8
Overall I have been able to complete treatment sessions adequately	4 (n = 2)	4.8	4.8
The CE was provided me assistance, suggestions or support during the sessions	4.4 (n = 4)	4.8	5
If so, CE assistance or support during sessions assisted me positively during sessions.	4.3 (n = 5)	4.9	5
The clients generally address the student clinician/s during the session most of the time	4.2 (n = 6)	4.7	4.8
I would feel confident using telehealth in the future			5
I feel having telehealth experience places me at an advantage when applying for jobs			5
I would recommend a telehealth clinical education experience for future students			5

Note. 1 = *totally disagree*, 2 = *disagree*, 3 = *neither agree nor disagree*, 4 = *agree*, and 5 = *totally agree*.
*reported in means

exhibit other aspects of "traditional" professional etiquette such as shaking the client's hand to greet them and walking them to the door after the session.

Student SLPs reported developing an appreciation for the different boundaries established with the client during in-clinic sessions as compared to telehealth sessions. For example, one student reflected that in a in-clinic context clients appear to "know the boundaries of when/where to have their therapy" and this promotes presence and engagement with the session. They also felt that telehealth sessions were not taken as seriously by clients as they are "Too convenient for clients – they do not delegate a set time where they are 100% focused on the treatment". Comments such as these were associated with the observation of some clients multitasking during telehealth sessions.

Theme 2: Student SLP perspectives on managing anxiety, self-consciousness and pressure to perform

Throughout the placement, student SLPs reported experiencing anxiety and feeling self-conscious about their clinical performance. Interestingly, they reported more anxiety during in-clinic sessions as compared to telehealth sessions. During the in-clinic sessions, students reported a fear of making mistakes in front of the clinical educator (CE),

clients and peers and were very "conscious of the clients watching me". One student felt more exposed during in-clinic clinic sessions as the client "can see if you are shaking!". During telehealth sessions however, students felt they could refer to their notes more easily and this helped them feel more secure in their performance.

Student SLPs also expressed feelings of (self) pressure to perform. At times, in both the telehealth and in-clinic sessions, they felt unable to answer direct questions from clients. Students reported feeling more pressure to respond to these questions during in-clinic sessions compared to telehealth sessions. Again this appeared to be related to how they would be perceived by others. One student revealed that they were "terrified of stuffing up in the clients [sic] presence", whereas in the telehealth session students felt there were more options for seeking the support they needed – for example, "being able to speak to CE away from camera". Despite the relative comfort with the telehealth sessions, one student did reflect that that in-clinic sessions were necessary to prepare students for the reality of the future workforce.

Theme 3: Differences in the approach to learning

Student SLPs commented favourably about the feedback they received during telehealth sessions compared to in-clinic sessions. Telehealth sessions allowed them to
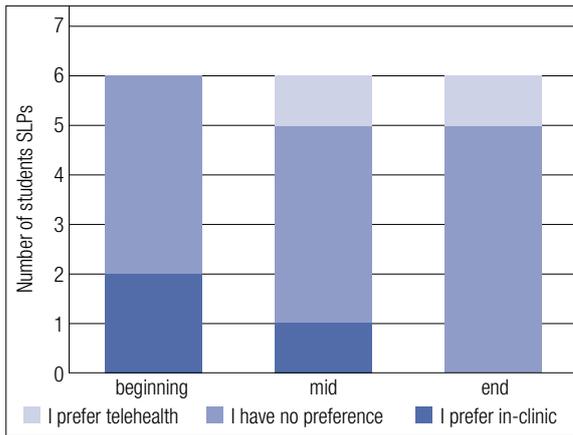
Figure 1. Student attitudes towards telehealth during placement

receive "online feedback from the clinician without disturbing the session". In contrast, they felt that real-time feedback during in-clinic sessions had a greater propensity to interrupt the flow of the session. This may reflect the client having more direct visual access to the clinician during in-clinic sessions compared to telehealth. Further, telehealth allowed the student SLP to see themselves. This provided real-time visual feedback to the student about how they were performing and was perceived by most as "a benefit is that you can see yourself and how you look when working". While this was mostly helpful in facilitating online adjustment of manner and delivery, one student found this disconcerting and stated that the"worst thing about telehealth? [is] seeing myself on screen".

Theme 4: Ease of service access
Student SLPs reported that telehealth increased convenience for both clients and SLPs. They found it more

convenient to conduct telehealth sessions both for the "ease for clients" and also because there was less need "to have space organised and neat" as is required in a traditional clinic session. Student SLPs also appreciated that telehealth service delivery made it more convenient for the clients to access services as they did not have to travel to the clinic. One student noted that telehealth made it possible to offer "services to people who otherwise would not have access", while another recognised the potential of the model to "give increased access to clients". The students considered the ability to treat a diverse range of clients an advantage of telehealth with students valuing the possibility of "Being able to treat clients all over the world" and "treat[ing] clients regardless of where they are". This included providing treatment to clients based overseas and in different time zones.

Theme 5: Clinical considerations with telehealth: Pros and cons
Student SLPs commented that using telehealth to treat clients in their own environment may facilitate transfer of fluent speech skills into a client's everyday communication environment as it "allows you to see a client in an environment that they need transfer to occur so it almost accelerates fluency stages" and "transfer of their skills".

In terms of disadvantages, almost all students (5 out of 6) reported that technical issues affected the quality of at least one therapy session with "glitches in the sounds", "poor internet quality affecting session/noise" and "one instance of bad internet making [the] session difficult" being the most pervasive issues. Students reported speaking louder than they normally would during telehealth sessions and felt that identifying stuttering was easier in the in-clinic sessions as compared to telehealth because it they could "notice secondary characteristics in fluency" and "clearly
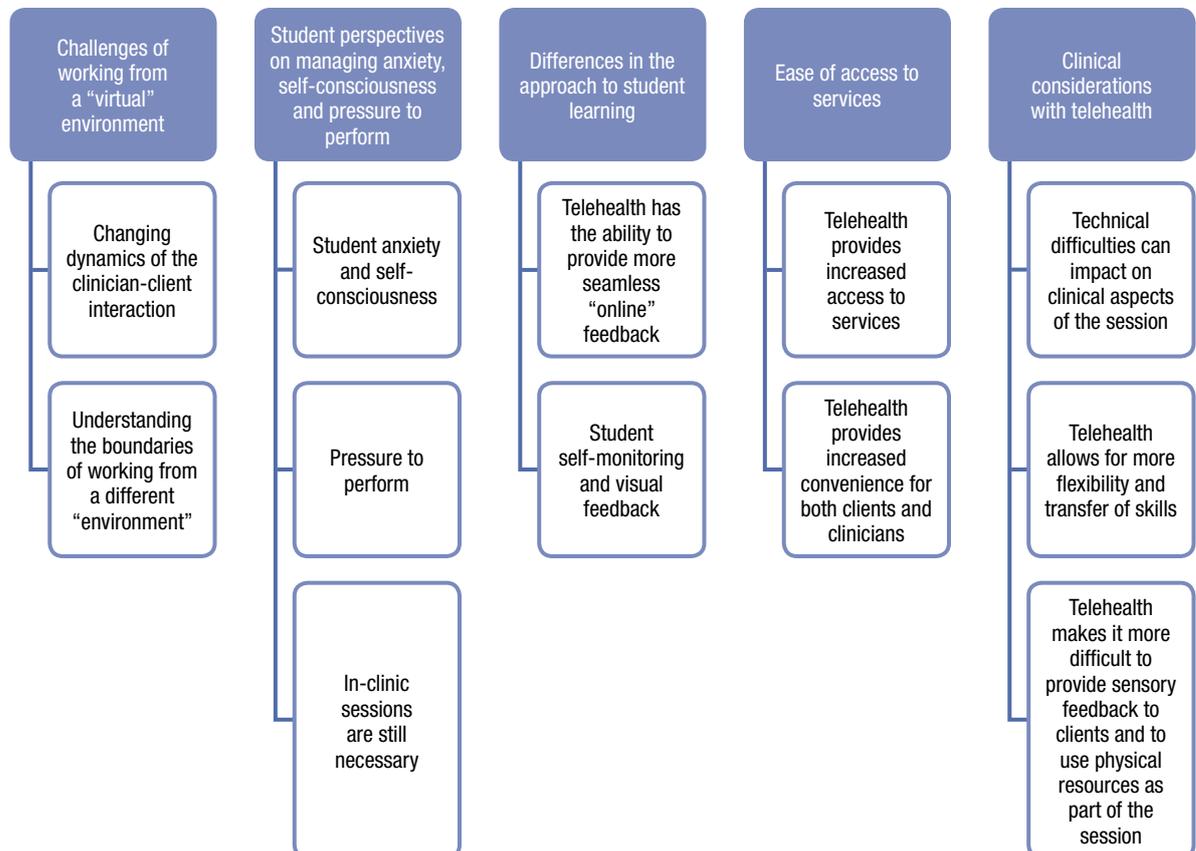

Figure 2. Themes and subthemes

see the stuttering characteristics". Student SLPs also reported that telehealth made it difficult to use physical resources as part of the session, for example stimulus materials. Contingencies were also required in the instances that communication with international clients was required. These included using the instant messenger function on Skype™ or ensuring clients had access to their email.

Discussion

This preliminary, small-scale exploration of student SLPs' attitudes and experiences of telehealth service delivery on clinical placement yielded favourable outcomes supporting the use of telehealth services in tertiary education. The findings of this pilot study are similar to those of larger studies of student perspectives (e.g., Bull et al., 2016; Glinkowski et al., 2013; Lam et al., 2016), in that, by the end of their placement, the majority of students perceived telehealth to be an accessible and convenient mode of service delivery. Also consistent with previous studies was that despite telehealth being viewed positively, student SLPs still experienced technological issues and reported challenges working within the virtual space (Bull et al., 2016; Glinkowski et al., 2013) including the impersonal nature of telehealth that has been described previously (Lam et al., 2016).

The most unexpected finding in this evaluation was that student SLPs reported feeling less anxious during telehealth sessions than in a traditional clinical context, despite having more experience with the latter across their previous placements. This finding most likely reflects the student SLPs' comments that CE feedback and scaffolding during telehealth sessions was less disruptive to the flow of sessions. Consequently, this may have reduced student SLPs' angst about being corrected by their CE in front of a client. Telehealth allowed for the student to be instructed or supported "out of view" of the client, with the CE writing notes, gesturing or whispering real-time feedback or clinical suggestions. Such real-time coaching is similar to current simulated learning experiences that allow for "built-in feedback", immediate behaviour modification and "extra assistance" (MacBean, Theodoros, Davidson & Hill, 2013).

Five of the six student SLPs strongly indicated a need for telehealth training within tertiary education models. Explicit training could be integrated at a cohort level with the inclusion of telehealth skills and guidelines embedded within course curriculum. Examples of such include the Speech Pathology Australia Position Statement on Telepractice (SPA, 2014) and the more recent Australian College of Rural and Remote Medicine Telehealth Advisory Committee Standards Framework (Australian College of Rural & Remote Medicine, 2016), which details quality aspects of synchronous video consultations. These include information about clinical, technical and contextual aspects of telehealth. On-line simulation programs may also be a beneficial teaching method (Ellis, Hercelinskyj, & McEwan, 2011; MacBean et al., 2013). Such training is likely to see an increase of SLP-led telehealth services developed, as predicted by the Speech Pathology Australia 2030 report.

Consistent with existing literature (May & Erickson, 2014; Theodoros, 2011), providing knowledge, training and experience in telehealth service delivery resulted in all student SLPs within this service evaluation developing a positive attitude toward the use of telehealth and viewing it as an advantageous addition to their skill set as new graduates. Responses to Likert-scale questions indicated that student SLPs felt confident using telehealth in their future clinical practice following graduation.

It is important to note the finding that most student SLPs did not have a preference for in-clinic over telehealth service delivery pre-placement, despite a lack of experience with telehealth service delivery. This finding is at odds with previous literature reporting SLP resistance in the uptake of telehealth as a service delivery model (Margaryan et al., 2011). Given that none of the student SLPs had experienced telehealth on previous placements, their lack of preference for in-clinic service delivery may be a reflection of their confidence in being supervised and supported throughout the learning process (Lam et al., 2016).

Limitations and future directions

Generalisability of this data is limited by the small sample size and thus the findings must be interpreted cautiously. It is recommended that future studies exploring student SLP telehealth service delivery include a larger sample size, treatment outcomes and include in-depth qualitative reports from clients. The use of pre-post self-report measures are known to have inherent limitations, namely the lack of control over the variables affecting change. Respondents are also potentially biased in their responses as they may be aware that the objective of pre-post surveys is to demonstrate positive change. This could be addressed in future studies by having clinical sessions recorded and then presented to blind assessors for behavioural observation. Such measurement of clinical behaviour could also occur before and after explicit telehealth training. Finally, such practices should also be extended to student clinical education in other practice areas of speech pathology.

Conclusion

With the development and expansion of eHealth, the speech pathology profession must ensure that clinical education directly exposes students to telehealth service delivery, rather than assuming that students' in-clinic experiences or familiarity with personal technology are directly transferable to professional telehealth contexts. Creating direct learning experiences within tertiary health science courses may serve to increase student SLPs' confidence and capacity to engage with telehealth. In turn, this will result in future graduates being proficient and willing to engage with this increasingly utilised method of service delivery.

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Recommendations for effective telesupervision of allied health students on placements

Srivalli Nagarajan, Lindy McAllister, LuAnne McFarlane, Mark Hall, Corilie Schmitz, Robin Roots, Donna Drynan, Lisa Avery, Sue Murphy, and Mary Lam

A lack of staff to provide direct student supervision when students are located in a range of sites, including student placements at locations remote from their home university, provides a challenge for effective "in-person" supervision. The availability of relatively inexpensive and portable information communication technologies (ICT) makes telesupervision (TS) of student placements possible, and with appropriate recommendations in place, TS can be effective. It can be used to provide students with encouragement to maximise learning outcomes, connect students at different sites to facilitate peer learning, and deepen university-based staff understanding of students' placement experiences. Recommendations for the use of TS to reduce ICT barriers, manage privacy and confidentiality issues, and maximise learning from TS sessions presented in this paper are derived from a research collaboration between one Australian and two Canadian universities.

Telesupervision (TS) is the use of information and communication technology (ICT) tools/technologies for communication between university-based academic staff (such as placement coordinators, clinical educators, tutors – hereafter referred to as university staff), clinical education/fieldwork placement supervisors at placement sites external to universities (hereafter referred to as supervisors) and students undertaking clinical education/fieldwork placements (hereafter referred to as placements). TS (also known as e-supervision, external/remote supervision or telesupport) is attracting considerable interest from health educators around the world due to its potential use in mitigating placement challenges. Challenges include: insufficient placement numbers, lack of availability of on-site clinical/professional expertise, lack of availability of supervisors or placement site staff with expertise for specific placement types or clinical populations, and excessive clinician workloads which may limit the number of students who can be supervised at a site. Dudding (2012)

describes three models of TS. One model includes direct observations of student and client interactions using distance technology. A second involves students and university staff communicating about the student experience in a consultative model. A third model involves university staff review of video, data or other materials provided by the student and then providing feedback or discussion through email or video/audio conference.

Recent studies suggest that TS achieves similar educational outcomes, or at least has no negative impact on students' capacity to develop and demonstrate practice competence when compared with direct, on-site supervision (Andrews et al., 2011; Chipchase et al., 2014; Dudding & Justice, 2004). Current literature on TS also suggests other positive benefits to utilising TS for student placements, including (a) efficiency in communicating with students during their distant (also referred to as rural or remote) placement experiences (Hall, 2013), (b) flexible and accessible means of enabling quality interactions between students and supervisors (Taylor, 2009), and (c) enhanced student learning when used to complement on-site supervision (Reese et al., 2009; Chipchase et al., 2014).

The purpose of this paper is to provide recommendations, including a specific pre-placement checklist (see Appendix), for university staff who are considering implementing TS to supervise or support student placements in allied health settings. These recommendations are grounded in data (Nagarajan et al., 2015) and incorporate critical reflections on the experiences of these authors after implementing telesupervision practices across a number of placement settings.

Background

The recommendations and discussion in this paper are based on a formal evaluation of the use of TS in a recent research project involving Australian and Canadian allied health students and university placement coordinators (Nagarajan et al., 2015), funded by the International Program Development Fund at an Australian university. That interdisciplinary study involved one Australian and two Canadian universities, focused on placements in speech-language pathology (SLP), occupational therapy (OT), physiotherapy (PT) and exercise physiology (EP) programs and explored: (a) the barriers and challenges associated with using personal ICT tools such as tablets and smartphones, and technologies such as internet phone systems (e.g.,Skype™) for TS of allied health placements; (b) student and university staff experiences of TS; and (c)

Srivalli Nagarajan (top) and Lindy McAllister

the perceived impact of TS on student learning experience and outcomes. Placements that involved TS varied by type (traditional/clinical, role-established non-clinical, and role-emerging) and by practice context (international, rural and metropolitan).

Survey data from 39 undergraduate and graduate entry masters students from the disciplines of SLP, OT, PT and EP and in-depth interview data from 9 university staff in those disciplines explored the experience of receiving and providing TS, and led to the identification of benefits and barriers of TS (Nagarajan et al., 2015; Nagarajan et al., 2016). These findings are summarised in Table 1.

Table 1. Summary of student and staff perceived benefits and barriers to use of telesupervision	
Category	**Results**
Students	*Perceived benefits:* • enhanced learning experience on placement; • video conferencing providing a more suitable means for communication than email; • the opportunity for timely feedback; and • connectedness to university supervisors. *Reported barriers:* • technological issues; • lack of internet access; • scheduling difficulties; • lack of privacy; • lack of familiarity with ICT; • compatibility issues; • absence of communication protocols; and • the burden of carrying personal ICT devices.
Staff	*Perceived benefits:* • enhanced learning experience for students on placements; • a greater understanding of students' placement experiences; • a more efficient way of communicating with students; and • connectedness with students. *Reported barriers:* • scheduling TS (most frequent); • concerns about time-cost benefit of TS; • lack of confidence with using technology; and • technological barriers.

From top to bottom: LuAnne McFarlane, Mark Hall, Corilie Schmitz and Robin Roots

The purpose of TS and models of TS utilised by Nagarajan and colleagues (2015) varied to suit the needs of the students and the type and context of placement sites. In some situations, university staff provided TS when a discipline-specific, on-site supervisor was not present (e.g., on a role-emerging placement). In other situations, the university staff augmented the professional support and direct supervision offered at the placement site in role-established or traditional placements. In the Nagarajan et al. (2015) study, at no point in any of the contexts was TS used to observe direct clinical interactions between students and clients. Despite the variation in type, context, availability of on-site supervision, and the resulting need for the placement coordinators to utilise flexible approaches to TS, a number of factors impacting on successful implementation of TS emerged. The nine recommendations presented in this paper incorporate these factors and build on previously presented data and perspectives. The recommendations are listed inTable 2.

Table 2. Recommendations for effective telesupervision of students	
Stage of telesupervision process	**Recommendation**
Pre-placement	1. Establish a clear rationale for using telesupervision 2. Be realistic about time commitments and resources 3. Proactively address logistics (scheduling, room requirements, audio and video set up) 4. Establish clear goals and expectations of telesupervision sessions with all participants 5. Select readily available ICT tools and technologies 6. Negotiate a suitable schedule for telesupervision 7. Consider and manage privacy and confidentiality issues
During placement	8. Stay student-centred
Post placement	9. Evaluate, review, and act

Discussion of recommendations for telesupervision

1. Establish a clear rationale for using telesupervision

Prior to the implementation of TS to support student learning in a specific context, a careful review of purpose, benefits and limitations is needed to make an informed decision about whether or not TS is appropriate for the particular placement situation. Being clear about the purpose of TS includes consideration of desired outcomes of each TS session because each interaction can have a different focus or intention. Broad purposes of TS include: (a) "off-site" monitoring of student development and progress; (b) supporting students and placement site supervisors during "at risk" placements; (c) increasing student opportunities for sharing and collaboration; and (d) responding to unexpected situations.

"Off-site" monitoring of student development

When no discipline-specific supervisor is available on-site and time and cost of travel to sites limit the direct support available from the university program, TS can be utilised on a regular basis by university staff to engage students in discussion of clinical issues. Telesupervision can support students to deliver quality services and client care, although caution is needed in support given if no direct observation of students delivering care is undertaken using TS. Any identified academic and clinical placement challenges may benefit from the additional mentoring and support available through TS. Increased availability of support from the university staff can also lessen the load of on-site placement supervisors.

Supporting students and placement site supervisors during "at risk" placements

"At risk" placements include placements where there is a perception of increased difficulty or "risk" because of context or client complexity, remote or international placements, or placements where students lack confidence or competence, struggling in their current placement or with a history of struggling on previous placements. In these

circumstances, timely TS can pre-empt difficulties or address challenges that have already arisen. Evidence suggests that students appreciated the use of videoconferencing, as it allows for interpretation of body language and created a perception of a more personal connection with the university staff and other students, in comparison to audio only TS (Nagarajan et al., 2015; Stewart & Carpenter, 2009). Telesupervision can support students to work through challenges associated with living and working in a different cultural context, more efficiently than through more traditional methods such as email.

Increasing student opportunities for sharing and collaboration

Telesupervision can be used to facilitate student learning by increasing opportunities for peer collaboration, learning and support. TS can simultaneously connect several students who are completing placements in a similar setting or with similar populations. This can occur with or without a supervisor present, depending on the purpose of the TS sessions. Supporting students to consolidate feedback from mid- and end of placement assessment and develop ongoing learning plans is an important component of learning on placement. Where there is no on-site supervision on a placement, or limited discipline-specific supervision to facilitate this, TS can assist students to reflect on feedback and develop learning plans. TS can support problem identification at mid-term and allow implementation of additional timely supports to address challenges before final assessments of student outcomes. Use of TS may also provide opportunities for mentoring from university staff.

Responding to unexpected situations

Use of telesupervision enables university staff to respond to unexpected clinical or personal situations that require urgent intervention or support. The student or the supervisor may identify such situations (e.g., challenges in the workplace such as sudden staff shortages, critical incidents involving client care or safety, and difficulties in the supervisor–student relationship). Telesupervision may help assure duties of care for clients and students are fulfilled, and may contribute to resolution of difficulties.

2. Be realistic about time commitment and resources

Having specific goals for each TS session will help determine time and resource needs. Dudding (2004) reported substantial saving through using TS due to reductions in travel time and expenses, and subsequent increases in telesupervisor productivity. These benefits may be dependent on location of the students (i.e., urban/near the university or rural/ remote from the university), number of students, the size of education program, and number of university staff involved. Hall (2013) reported TS sessions lasting on average 25 minutes. Provision of individual TS to every student in a large program would require a significant time commitment by university staff. This time commitment may exceed that required for face-to-face meetings due to time spent organising schedules and technology involved. It is therefore essential to limit TS to situations with the most potential benefit. Once decisions regarding the purposes of TS and how to best use the time and resources available have been made, a variety of steps are needed to ensure effective and efficient implementation.

3. Proactively address logistics (scheduling, room requirements, audio and video set up)

Determine and confirm dates for placements in which TS will be used. The nature of the TS component of the placement and the implications for TS (e.g., amount of support, use of devices and technologies) should be agreed upon by the student, the site and the university prior to the placement. During TS sessions ensure that rooms/offices where the telesupervisor and student(s) are located are private, with limited audible external noise and interruptions by patients or other staff. All participants should be encouraged to use a headset with microphone for good audio quality and to avoid audio feedback, and to mute their microphone when others are speaking. This helps minimise interruptions and maintain confidentiality. To enhance the quality of the video experience, room lighting should be considered, and participants should avoid sitting in a backlit area or where insufficient light is on the participant's face. Correct positioning of video cameras will ensure that individual or student groups are visible during the TS.

4. Establish clear goals and expectations for each TS session with all participants

It is important that student(s), supervisor(s) and university staff have shared understandings of the purpose and expectations of each TS interaction. During international placements students may travel to developing countries where the practice of the discipline may not be as established as it is in Canada or Australia. The study by Nagarajan et al. (2015) illustrates the importance of clarifying goals and expectations for how TS will be used to support students. They report on a situation where students were supervised on-site by a local practitioner with supplemental TS from staff at the students' university. It was agreed apriori that during these placements TS sessions would occur at three points in the placement: shortly after arrival; just before mid-placement; and a week before completion of the 6–8 week placement. Students were aware that goals of the TS sessions included checking on clinical progress and learning goals, as well as discussing clients' assessment, intervention and progress. Students were responsible for drafting an agenda for each session which allowed them time to prepare their cases and questions, and to have needed materials (e.g., assessment information and treatment plans) on hand for discussion.

In other situations, TS sessions may provide additional support to students in difficulty. In addition to on-site supervision, a university staff member may provide a student with weekly TS to discuss specific placement learning goals, work through challenging cases and formulate plans for progress.

5. Select readily available ICT tools and technologies

Determine ICT device use and placement facility regulations

The model of TS used, whether remote supervision in the absence of an on-site supervisor or as additional TS support to supplement on-site supervision, may determine the ICT device used. In some facilities, privacy regulations may prevent students from using their own ICT device for TS in which video and audio of client intervention is transmitted off-site. In these instances, secure ICT systems at the facility will be required and the feasibility and availability of these systems must be determined and negotiated with the placement facility prior to the placement. University staff providing TS would use their university's ICT systems to connect to the secure placement facility system in order to provide TS.

Where regulations do permit the use of a student's personal ICT device for TS, whenever possible the student

From top to bottom: Donna Drynan, Lisa Avery, Sue Murphy and Mary Lam

should connect to the wi-fi of the placement facility or their home in order to establish the video link. If wi-fi is not available in the facility or in the student's accommodation (e.g., in remote placement locations) and a data plan is required, the responsibility for the cost of this plan (whether the university, placement site or student) must also be determined prior to the placement starting.

Select appropriate ICT technologies

It is important to choose readily available ICT technologies that are free, low-cost or university-supported for TS as the majority of students have access to such resources. Technological improvements in free applications like Skype™, Google Hangouts™, WhatsApp™ and FaceTime™ allow good quality video conferencing platforms; however, it is important to be aware that audio and video quality is often determined by the strength of the wi-fi signal and capabilities (e.g., processing power and camera resolution) of the ICT device. During setup ensure that usernames or dial-in information, if required, have been shared between participants. All audio/video connections should be tested for quality prior to any TS. It is also important to consider the availability of ICT support for students at placement sites and access to remote troubleshooting options (e.g., determining whether the student's home university offers web-based or email ICT support).

Establish a backup plan if TS fails

Using ICT for TS has inherent technical challenges and if technology fails, student support and learning may be compromised. It is critical to have a written backup plan with strategies to minimise any disruption. For example, prior agreement between TS supervisor and students to switch to audio mode if video mode isn't working well or switching to text messaging or email applications for continuing discussion or to discuss rescheduling.

6. Negotiate a suitable schedule for TS

The frequency of TS sessions should meet student needs. These needs may vary according to student course level, placement type, student competence, presence of discipline-specific supervisor on-site, and client/setting complexity. In general, students in the earlier years of their programs, or those experiencing difficulty in a placement, require more frequent and more direct supervision. Experienced students may require less frequent TS sessions that utilise more on a coaching while still providing students the opportunity to ask questions about clients or events in their placement environments (Burns, Beauchesne, Ryan-Krause & Sawin, 2006). Twice weekly TS may be more appropriate for supporting students in placements with no discipline-specific supervisor on-site and weekly sessions may be appropriate if the purpose of TS is primarily to monitor progress, provide general student support and discuss student specific learning needs. The university staff providing TS should have a clear understanding of both student and placement needs to determine the amount and frequency of the TS, and meet individual learning needs of the student (Kirke, Layton & Sim, 2007). Once determined, the frequency, dates and times of TS meetings should be confirmed with the student in writing prior to the placement starting.

When students are at remote locations it is particularly important to have timely access to supervisory support, both for client and student safety and also for pedagogical reasons. Learning is deeper and more effective when feedback and guidance is provided in a timely manner and specific examples of behaviour are used (Marriott &

Galbraith, 2005). Although scheduled weekly TS sessions are helpful, there needs to be a means to provide "just in time" help and support if a student has an urgent placement or personal issue. For example, in an interprofessional environment where a student is supervised by a clinician who is not of the same discipline, a remotely located telesupervisor from the student's own discipline should be accessible and available, for example by phone, or through "instant messaging" to discuss discipline-specific clinical issues which may impact on client care.

7. Consider and manage privacy and confidentiality issues

Prior to the placement it is important to discuss with students privacy and confidentiality issues that may be applicable to their placement contexts. For individual TS sessions, ensure that there is a shared understanding that the discussion during TS will be treated the same as standard face-to-face meetings to ensure confidentiality. For group TS sessions, a protocol should be set prior to the commencement of TS in relation to discussion of any matters that are of a private nature. For example, personal issues should not be raised during group TS sessions and a separate appointment (TS or face-to-face) should be scheduled with the university placement coordinator to discuss these types of issues. To maximise privacy and confidentiality, all students, supervisors and university staff participating in TS must agree that TS sessions will not be recorded. University staff should also remind students not to discuss clients or placement site staff by name and that only non-identifiable information should be shared.

A pre-telesupervision checklist addressing points 1–7 is provided in the Appendix.

8. Stay student-centred

It is sometimes easy for university staff to forget student learning needs and focus instead on what the staff feel the student "ought" to know in a specific placement setting. This can be particularly problematic when the staff member is at an "expert" level of competence making it hard to remember what a novice needs to know or what entry level practice competency requirements are in a specific setting. Even when there is a desire to be unstructured in TS and follow the student's lead, it is a helpful strategy to have a few questions prepared as "back up" to stimulate discussion and information sharing when needed (e.g., How does service delivery differ in this region? What have you learned about the culture of the region?). Nagarajan et al. (2015) found that some TS sessions flowed easily through a variety of relevant topics without the use of pre-planned questions and cues, but other sessions were more productive when questions were used to scaffold the discussion between the supervisor and the student(s).

As in all learning interactions between staff and students, whether face-to-face or TS, knowing a student's individual learning style and learning goals is key to a student-centred approach, enabling teaching strategies to be tailored to student need. Strategies to become more student-centred during discussion include: (a) asking the student what their perceived learning needs are, (b) clarifying student experience in a specific area, (c) asking for student reflection on learning so far in the setting, and (d) asking whether the level of discussion on the placement is meeting student needs. Asking students at the outset "how they learn best" is also an effective student-centred strategy (Biggs, 2003). Removal of the face-to-face dimension means that utilising TS requires extra effort to build trust in order to have an open, honest communication. TS may not fit optimally with all learning styles, and an awareness of this

can assist in choosing which students to select for TS, or for using additional strategies to ensure a positive learning experience for the student.

9. Evaluate, review and act

Understanding the TS experiences of students and staff involved in TS is important for continuous quality improvement of TS. Both formal and informal feedback should be collected and reviewed. This can be accomplished through a short survey or questionnaire that addresses the following: (a) participants' familiarity with using ICT, (b) ICT- and non-ICT-related barriers encountered and ease of using the ICT for TS, (c) perceptions of the cost and time effectiveness of providing TS, and (d) value-adding aspects of TS. Lessons learned and evaluation results can inform planning of future TS sessions at a specific placement site or similar sites. Encouraging students to create "how to" manuals or provide suggestions for the future planning for TS sessions is also warranted.

Conclusion

While there are inevitable technological challenges associated with using ICT for telesupervision, research and practical experience using ICT for TS has shown that careful planning and consideration of the context and the purpose of the TS results in positive perceptions by both students and university placement staff. When implemented purposefully and conscientiously, telesupervision is a viable and effective option to provide support and supervision to some types of allied health placements and may add significant value to the student learning experience.

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Pre-telesupervision checklist[a]

Student name: .... Cohort details: ....

Placement site: .... Telesupervisor name: .... Date....................

Action item	Comments
General	
☐ Students placement start and end date confirmed	
Telesupervision purpose and expectations	
☐ Explain nature of telesupervision component of specific placement and implications for students, site, university	
☐ Explained to students telesupervision is *additional* support to existing clinical supervision arrangements	
ICT tools and technologies	
☐ Determine ICT device use and rules (consider placement site usage policies, off site options)	
☐ Students informed that they have to *provide their own ICT device* and that they will be required to *use their own ICT device* (for example, Smartphone/iPhone, iPad) for receiving telesupervision	
☐ Determine suitable communication platform for telesupervision	

☐ Discuss with students
    a. Communication requirements (use of Skype, Adobe connect, FaceTime, etc.)
    b. Ensure details such as Skype user names are noted	

☐ Internet access and cost implications discussed with students. *If applicable* determine if university/site or student costs	
Scheduling	
☐ Negotiate a schedule and duration for providing telesupervision	
☐ Confirm the telesupervision meeting times and dates in writing prior to commencement	
Logistics	
☐ Consider and address logistical issues (room requirements, audio and video set up)	
☐ Stability of wi-fi discussed/checked	
☐ *Develop* and *share* discussed back up plans in the event Internet accessibility becomes problematic for the students (example, switch to phone, use of emails for further clarification after the session, discuss reschedule)	
Privacy and confidentiality	
☐ Inform students about privacy considerations necessary for telesupervision sessions (choosing a place not too noisy, not frequented by patients or other staff if inside placement sites). If outside placement sites, discuss safety	
☐ Remind students not to discuss patients by name (i.e., only non-identifiable patient information to be shared) (goes with above)	
Additional resources	
☐ Inform students of any other resources they may need to have access to prior to telesupervision sessions. (For example, prepare for session: agenda and materials needed determined ahead of time)	
Emergency contact details	
☐ Inform students about any other communication protocols (email contact in emergencies, phone)	
[a] Checklist completed by university academics providing telesupervision.	

What's the evidence?

Developmental language disorder and non-verbal IQ

Natalie Munro and Cori Williams

Clinical scenario

A speech pathologist has been asked to run a small group (n = 6) language intervention focusing on vocabulary and morpho-syntax at a local primary school. She checks the children's case files. All are in their first year of formal schooling. Three of them have been diagnosed with developmental language disorder (DLD) and have non-verbal IQ standard scores over 85. Three other children also have a diagnosis of DLD but their non-verbal IQ scores fall within the 71–84 range – borderline intellectual disability as defined by the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.) (DSM-V; American Psychiatric Association, 2013) guidelines. The speech pathologist is familiar with the term *specific language impairment*, which is predicated on non-verbal IQ within the normal range. She is also aware that the term *developmental language disorder* has recently been discussed with the aim of including children with language disorder but non-verbal IQ outside the normal range. She wonders whether the children with lower IQ can be considered to have a language disorder. She also wonders whether the two subgroups of children will differ in their response to language intervention. Maybe the children with low non-verbal IQ won't respond? Maybe they shouldn't be on her busy caseload?

Answerable questions

The clinician identifies two key questions, one of which she frames as a PICO question:

1. Should a child with non-verbal IQ below the normal range be considered to have a language disorder or are language skills the result of the intellectual disability?
2. Does a primary school-aged child with DLD and low non-verbal IQ (between 71 and 84) (P) respond to language intervention (I) in the same way (O) as a child with DLD and non-verbal IQ above 85 (all other things being equal) (C)?

Search strategy

Faced with limited access to research databases, and aware of the recent discussion around the term developmental language disorder, the clinician considers the online resources related to the Raising Awareness of Developmental Language Disorder campaign (#DLD1-2-3 campaign on https://facebook.com/radld.page, Twitter @ RADLDcam, and https://www.youtube.com/radld). She identifies two peer-reviewed, open access articles published by Professor Dorothy Bishop and the CATALISE

consortium (Bishop, Snowling, Thompson, Greenhalgh & The CATALISE consortium, 2016; Bishop, Snowling, Thompson, Greenhalgh & The CATALISE-2 consortium, 2017). These two papers were developed through an online Delphi technique, used to achieve international consensus on key issues surrounding DLD. She is aware that expert opinion does not sit high on the hierarchy of systematic research, but concludes that the papers provide evidence related to clinical practice, an important consideration of E[3]BP (Dollaghan, 2007). The two papers inform clinical practice, and while not official clinical practice guidelines, both indicate that language disorder may occur in children with low non-verbal IQ (Bishop et al., 2016; Bishop et al., 2017). The term DLD is used for school-aged children who present with a persistent language disorder affecting social, emotional and/or academic outcomes, while the term *language disorder associated with X* – in this case, intellectual disability – would refer to those school-aged children with an intellectual disability and an associated language disorder.

Based on these statements, the clinician feels somewhat comfortable that non-verbal IQ should not be considered as part of an exclusionary process for the diagnosis of DLD (as was previously the case for *specific language impairment*), but she is not completely confident that she has an answer to the second clinical question. She does note that Bishop et al. (2016) indicate that, in identifying language disorder, a key consideration is "whether the child is likely to benefit from intervention, and that is not determined by IQ" (p. 15).

She turns to four references discussed by Bishop et al. (2016) cited to support the notion that the level of non-verbal IQ "does not determine response to language intervention" (p. 15). One referred to a computerised intervention that used acoustically modified speech (a treatment now discounted and not relevant to her practice) and found no treatment effect (Bishop, Adams & Rosen, 2006), while one other focused on preschool children (Cole, Dale & Mills, 1990). The most relevant appeared to be Bowyer-Crane, Snowling, Duff, and Hulme (2011). The clinician was able to locate an abstract of the paper in ERIC (Education Resources Information Centre: https://eric.ed.gov/), but the full paper was not available. From the abstract she finds that the researchers conducted a post-hoc analysis of an earlier RCT (NHMRC Level II evidence) in which young school-aged children received either a phonology with reading (PR) intervention or an oral language (OL) intervention (Bowyer et al., 2008). The intervention was delivered by trained teaching assistants and involved both

Natalie Munro (top) and Cori Williams

group and individual work. The earlier study found that the children who received the OL intervention improved on measures of vocabulary and grammar but not on literacy skills. Similarly, the children who received the PR intervention improved on measures of literacy but not on oral language skills. Crucially, for her clinical question, Bowyer-Crane and colleagues (2011) found that non-verbal IQ did not mediate the response to language intervention, meaning that when children were grouped into DLD with or without lower non-verbal IQ, both groups still improved on measures of vocabulary and expressive grammar. A similar conclusion – that non-verbal IQ did not significantly moderate language intervention outcome – was also reached in another RCT involving older school-aged children (Boyle, McCartney, Forbes, & O'Hare, 2007).

The clinician has recently become aware of three valuable, free resources for the identification of evidence – the ASHA Evidence Maps, SpeechBITE and TRIP Database. She searches the ASHA Evidence Maps (https://www.asha.org/MapLanding.aspx?id =8589947062), using the maps intellectual disability and spoken language disorder, and appropriate filter terms, but finds no relevant papers. Searches of the TRIP database fail to identify relevant papers. Within SpeechBITE she finds the rating of the methodological quality for the Bowyer et al. (2008) study and finds that the original RCT met 6 out of the 10 items relating to the internal validity and adequacy of the statistical comparisons reported for that trial (see http://speechbite.com/speechbite/search/detail/026151). However, the clinician notes that comparison of intervention outcomes for groups that differ in intellectual ability are difficult to find.

Although the clinician does not have access to scholarly databases through her workplace, she does have strong links with the university program in her local area. She contacts an academic staff member with interests in language disorders in school-aged children. The academic agrees to undertake a literature search. Due to demands on her time, she is able to search only one database, PsycINFO. She sends the following summary (Table 1) Note the search term "specific language impairment" is still used in order to capture previously published research.

The abstract of the study indicates that the main focus was the question of change over time for children with *developmental language impairment* (DLI) aged between 4 and 7 years; however, it also states that non-verbal IQ did not predict language change. The clinician thinks that it would be useful to read the whole paper but it is not an open access paper. She decides to use Google to locate

Table 1. Results of literature search by advising academic				
Database	Search terms	Limited to:	Papers identified	Papers kept
Psycinfo	children, language intervention, language disorders, specific language impairment, non-verbal IQ	peer reviewed, English language, 2010 –2017, scholarly journals	27	1*
* Botting, Gaynor, Tucker, & Orchard-Lisle (2016).				

the first author, searches the listing of publications, and is delighted to find that there is a free (pre-print) version of the paper available. She downloads the paper so that she is able to read the details of the study.

Clinical bottom line

The clinician is confident that she should definitely include school-aged children with DLD with or without low non-verbal IQ in her language intervention but doesn't know for sure what their outcomes will be. Some indications suggest that non-verbal IQ may not affect progress following intervention, but further research is needed to determine whether children with DLD and non-verbal IQ outside of the normal range will benefit from her interventions.

Future directions

The clinician has begun a collaboration with a researcher, and both are interested in taking the collaboration further. They agree to meet before the intervention begins to discuss the type of approach and measures that can be taken in order to begin to contribute to the research base. The researcher suggests a single subject, multiple baseline experimental design. This will require that progress is carefully tracked for each child, and reported individually. The researcher also suggests that the research question would benefit from further refinement – for example, by specifying the type of intervention. As the group is due to start soon, they are aware that this will not constitute publishable research, given the timelines for ethics approval. However, the design will provide useful records of progress during intervention for each child. They agree to continue to work together with the aim of developing a research project that will address this important clinical question, obtaining ethical approval and ultimately sharing their findings through publication in an appropriate journal.

Conclusion

The scenario presented here may well be a familiar one to clinicians. Access to scholarly databases and the articles published within the journals is not always available, but there is an increasing number of freely available, web-based resources for identifying evidence from systematic research. Clinicians can make use of these to address the questions arising in their clinical practice. Once potential evidence from external research is identified, accessing the publication listing of authors may provide access to an open access copy of the research – something which may otherwise be difficult for clinicians.

The scenario also indicates the value of clinician–researcher partnerships, in which the knowledge and experience of both can be used to make a contribution to the evidence base. No evidence is not bad evidence – but there are many areas in which we have little evidence. It falls to the profession to work towards addressing these gaps, using scientific methods to ensure the strongest possible evidence. Practice based evidence has the potential to contribute much to evidence-based practice (Lof, 2011).

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Navigating the path towards diagnosis of DLD and evidence-based interventions and supports

Ethical crossroads and roundabouts

Suze Leitão, Jenny Baker and Mandy Nayton

S uze Leitão and Jenny Baker are speech pathologists with many years of experience working with children with developmental language disorder (DLD) and specific learning disability (SLD), in a variety of settings (Suze is also the chair of the Ethics Board). In October 2017, they spent time discussing issues around DLD with Mandy Nayton, CEO of Dyslexia-SPELD and an educational and developmental psychologist. A diagnosis can have major implications for a child's educational and life journey.

In this column, the case study of Emma[1] is presented to illustrate ethical considerations that arise when managing students with a primary diagnosis of DLD. Of particular concern is when the diagnosis prevents students from meeting Criterion D of the *Diagnostic and Statistical Manual for Mental Disorders* (5th ed.) (DSM-5) Diagnostic Criteria for Specific Learning Disability, which is designed to rule out more plausible explanations for the difficulties being experienced by the student. We reflect on the implications of DLD not being recognised by any of the Australian state or territory education jurisdictions as being sufficient grounds for possible provision of special examination arrangements, and encourage speech pathologists to take on an advocacy role.

Suze Leitão (top), Jenny Baker (centre) and Mandy Nayton

A case study

Emma is in year 11 at a local Perth private school. Her parents reported that at the age of 4 she received speech pathology intervention for speech and sound development. They recalled her as being quite difficult to understand but responding well to therapy, which continued for 18 months. She has not received any further speech pathology intervention nor been assessed by any other allied health professionals since; however, she has been provided with in-school support for both reading and spelling. The family say this was in response to her ongoing difficulties. Emma's current high school has been very accommodating, giving her extra support at school, and extra time for her exams. Emma will sit her WACE[2] exams in November 2018, and all parties are concerned that an application for additional time cannot be made because she does not have a diagnosis. They requested Emma be assessed to determine the extent of her language and literacy difficulties, and to establish whether she presented with developmental language disorder (DLD) or a specific learning disorder (SLD) such as dyslexia.

The speech pathologist explained to her parents that she would commence with a language assessment, and provide them with the results in order to determine whether they would agree to continue with a follow-up literacy assessment. She explained that if the results indicated a DLD, it was likely that Emma would not be eligible for a diagnosis of SLD in written expression or reading. She would also need to be assessed by a psychologist to determine whether a diagnosis of SLD could be made. Emma and her parents agreed to the assessment.

Emma was first assessed using the CELF-4 (Semel, Wiig, & Secord, 2006). Her scores are included in Table 1.

Table 1. CELF-4 subtest scores	
CELF-4 subtest	**Scaled score**
Recalling sentences	4
Formulated Sentences	7
Word classes – Receptive	6
Word classes – Expressive	2
Word definitions	7
Understanding spoken paragraphs	8
Sentence assembly	4
Semantic relationships	8

The CELF – 4 Core Language Score (CLS) is considered to be a reliable way to evaluate a student's overall language performance, and is calculated from a combination of subtest scores that best discriminate between typical and disordered language performance. It comprises the subtests: Recalling Sentences, Formulated Sentences, Word Classes Total and Word Definitions. Emma's Core Language score was 73 (4th percentile) indicating a moderate delay.

The Receptive Language Index (RLI) score is a measure of overall auditory comprehension and listening from the subtests: Word Classes (Receptive), Understanding Spoken Paragraphs and Semantic Relationships. Emma's score for receptive language was 85 (16th percentile) indicating a mild delay.

The Expressive Language Index (ELI) comprises the subtests: Formulated Sentences, Recalling Sentences, Word Classes (expressive). Emma scored 65 (1st percentile) which indicates a severe delay.

On the basis of these standardised scores, the speech pathologist identified a profile consistent with DLD.[3] Emma's

literacy skills were assessed using the York Assessment of Reading for Comprehension (YARC; Snowling et al., 2009), the Comprehensive Test of Phonological Processing (2nd ed.) (CTOPP-2; Wagner, Torgesen, Rashotte & Pearson, 2013), the Woodcock Reading Mastery Test (3rd ed.) (WMRT-III; Woodcock, 2011), and the Written Expression subtest of the Oral and Written Language Scales II (OWLS II; Carrow-Woolfolk, 2011). A selection of Emma's assessment profile appears in tables 2, 3, 4 and 5.

Table 2. YARC: Summary of results

	Ability score	Standard score	Percentile rank (%)	Descriptive term
Reading rate (fluency)	71	79	8	Severe difficulty
Comprehension	55	80	9	Below average
Summarisation	48	–	–	Average

Table 3. CTOPP-2: Summary of results

	Percentile (%)	Standard Score	Description
Elision	25	8	Average
Blending Words	9	6	Below average
Phoneme Isolation	75	12	Average
Memory for Digits	5	5	Poor
Nonword Repetition	37	9	Average
Rapid Digit Naming	25	8	Average
Rapid Letter Naming	5	5	Poor

The standard scores obtained from the CTOPP-2 were then combined into composite scores for the three areas of phonological processing (Table 4).

Table 4. CTOPPS-2: Composite scores

CTOPP-2	Sum of SS	Percentile	Composite score	Description
Phonological awareness	26	30	92	Average
Phonological memory	14	12	82	Below average
Rapid automatic naming	13	8	79	Poor

In addition to the WRMT-III (Table 5), the Written Expression subtest of the OWLS II (Carrow-Woolfolk, 2011) was administered to assess Emma's written language ability in the absence of time constraints. This test measures linguistic and structural aspects of the writing process (working memory, vocabulary, grammar, and reasoning). In addition, conventions such as spelling and punctuation as well as text structure and content were also evaluated. Emma achieved a standard score of 89 (23rd percentile) in

this subtest, which is considered to be within the average range for her age group. It is important to note, however, that Emma's output as well as rate were low, and she was observed to write cautiously, frequently re-reading much of what she had written. As this was not a timed assessment, it may not be an accurate measure of her capacity to retrieve information, plan an essay and write a response under timed conditions.

Table 5. WMRT-III: Summary of results

Subtest	Standard score	Percentile rank	Description
Word identification	76	5	Below average
Word attack	78	7	Below average

Results of the literacy assessment revealed that Emma was performing in the below average range in a number of key areas including reading rate, accuracy and comprehension as well as in her word attack skills. Her written expression was considered to be just within the average range (when untimed). Phonological processing scores suggest weak rapid naming and phonological memory, with average development of phonological awareness.

A key issue

Emma clearly has significantly delayed oral language skills in the presence of extremely weak reading accuracy and written comprehension. If she had not been diagnosed with DLD, it is highly likely that she would receive a diagnosis of SLD (after 6 or more months of evidenced-based intervention targeting her specific areas of weakness – which in this case would be word attack strategies). However, as she has a diagnosis of DLD, she is not eligible for a diagnosis of SLD – and this will prevent her from applying for additional time in her WACE examinations.

How does this work?

The dilemma for both Emma and the speech pathologist working with her is that DLD is not currently recognised by any of the Australian state or territory education jurisdictions as being sufficient grounds for the provision of special examination arrangements, even in cases where severe functional impact is demonstrated. This means that unless an additional (and significant) contributor to her difficulties can be identified, she will not be eligible to apply for extra working time in her final exams.

This situation raises a number of questions, including:
- Should students who present with a primary diagnosis of DLD also be entitled to a secondary diagnosis of SLD?
- Should students who have DLD be entitled to apply for additional time for examinations?
- Should consideration be given to alternative accommodations that are more likely to be approved (e.g., a scanning pen)?

If we think about the case of Emma, then these questions matter very much.

The most common reason cited for a special examination arrangements (SEA) application is SLD (in particular a reading disorder, commonly referred to as dyslexia), and the most common arrangement provided is 10 minutes per hour of additional working time. In order for the extra time to be approved, the state-based examination authority

(e.g., SCSA, SACE, VCAA) must be confident that the student has a diagnosed learning disorder, and that the functional impact of the SLD is of sufficient magnitude that without the requested adjustment, the student would be discriminated against. At this stage, however, students with a diagnosis of DLD are not currently eligible to apply for additional working time in year 12 examinations.

Why can't Emma have a co-morbid diagnosis of SLD and DLD?

DSM-5 considers SLD to be a type of neurodevelopmental disorder that impedes the ability to learn or use specific academic skills (e.g., reading, writing, or arithmetic), which are the foundations for other academic learning. The learning difficulties are "unexpected" in relation to other aspects of development. Early signs of learning difficulties may appear in the preschool years (e.g., difficulty learning sounds for letters), but they can only be diagnosed reliably after starting formal education.

A co-morbid diagnosis of both DLD and SLD is very uncommon; essentially because in order to diagnose an SLD against DSM-5 criteria, all other more plausible explanations for the student's difficulties must be ruled out. In terms of students with DLD, their existing oral language disorder is considered as the explanation for their learning difficulties; it is the primary diagnosis, and as such, excludes them from being eligible for a secondary diagnosis of SLD. The fact that they are experiencing difficulty with written language (both reading and writing) is not altogether unexpected – given their difficulties with oral language.

The argument against

Not all students benefit from additional working or non-working time in exams. Unless students have acquired the subject-specific conceptual knowledge and developed the skills necessary to communicate this knowledge in a targeted, logical and coherent manner, they will not benefit from extra time. It could be argued that students with DLD will not necessarily benefit from extra time because the functional impact of their disorder relates more to their capacity to acquire, retrieve and communicate their knowledge, than it does to the skill of reading and writing accurately at an appropriate pace. A specific learning disorder, such as dyslexia, is frequently characterised by very slow and inaccurate reading, rather than the capacity to comprehend the material. For this reason, the provision of extra time is often found to benefit students with SLDs.

The argument for

A confounding factor in Emma's case is her track record. We know that, with the addition of the 10 minutes per hour, Emma has been able to pass the majority of English tasks in year 11 to date, and she has passed all prior English examinations. Her scores are normally within the range of mid 50s to low 60s. This level of achievement has been consistent in all three elements of the English course:
- comprehending,
- responding,
- composing.

It appears that Emma has come to depend on the additional 10 minutes per hour; she uses this time for a number of purposes: to re-read the texts in the comprehending section, and to plan and edit her essays in the responding and composing sections. She has also learned and practised effective techniques for structuring her essays and this, in combination with the additional time,

has afforded her the opportunity to successfully read and respond to a variety of exam questions. Knowledge that she has additional time at school when taking exams has also assisted to reduce Emma's high levels of anxiety; she is conscious of the fact that she does not have to read the questions quickly in order to glean information and she has extra time to prepare and write her response.

How can the instruction provided assist her to maximise additional time?

In order to support students such as Emma effectively, it is important to gather information that demonstrates both the impact of the disorder on individual students, and the value of specific accommodations that have been trialled successfully. In Emma's case, the fact that she struggled to complete her work under timed conditions was identified as an area of concern, and the provision of additional time was trialled as an accommodation. It was also recognised as important to work with Emma on both essay structure and effective time management, specifically managing the time allocated in examinations. Given her very poor reading accuracy, it may have been (and still may be) of value to trial the use of a scanning pen. A scanning pen is a device that can be used to read text aloud. It can also be used to read out word definitions, and capture and upload lines of text to a computer. Exam versions of scanning pens exist.

In the final year 12 English WACE examination, there are three sections. The first is identified as "comprehending" and requires students to read an unknown text and answer unseen questions. This is the most difficult component for students like Emma as they often struggle to read, analyse, and respond to three separate texts. Fortunately, of the three texts only two are written and one is usually a text requiring visual interpretation, but not reading. The second section of the exam is the "responding" component and students can use a range of strategies to prepare for the tasks involved. Emma would be able to learn and analyse several texts of her choice (e.g. a short story, speech and an image), and in the exam, she would be given a choice of approximately six questions to respond to in relation to one of her studied texts. With appropriate support, Emma would be able to learn how to interpret and respond to a number of questions across any of her prepared texts. This would require a great deal of work but is certainly feasible. In the third or "composing" section, Emma will need to have rehearsed a narrative, a speech or another text type to use in her composition. Again, this will be challenging, but not impossible, for Emma – with support.

In the event that Emma is given access to an additional 30 minutes of working time for the three-hour English exam, her greatest need is going to be the first section. It is highly likely that she would use all 30 minutes of the additional time to enable her to comprehend and respond to the texts provided. This will make the need for preparation in the other two areas vitally important.

What might be the best outcome for a student like Emma?

The best outcome for Emma is dependent on ensuring that she is given as much insight, support, encouragement and coaching/intervention as is possible leading up to her final year 12 exams. This will assist Emma in developing a greater awareness of the challenges and strengths she has; a factor that has been found to have a positive impact on students with learning difficulties.

It is vital to mount a case that students with DLD should be able to apply for SEAs. This is particularly important in cases where the student clearly does struggle under timed conditions, and is more successful when provided with extra time or an alternative accommodation, such as a scanning pen.

What do we need to do to advocate for students with DLD?

Unfortunately, there appears to be a lack of clearly documented evidence of the value to students with DLDs of extra time in examinations. Although it is likely that for many students extra time may do little to alter the outcomes, there are potentially numerous individuals, like Emma, for whom extra time could be of paramount importance. If it can be shown that the current policies and guidelines essentially disallow deserving students from participating in the examination process "on the same basis" as their peers, then it may be possible to encourage the inclusion of students with DLDs in the SEA process.

In the event that Emma continues to access additional time, passes her school exams, successfully completes her WACE exams, and is awarded an ATAR score at the completion of year 12, her case could be used as further evidence of the need for, and value of, improved support for students with DLD.

Our Speech Pathology Australia Code of Ethics reminds us that, in our duties to our clients and to the community (Section 3.1.6 Service planning and provision), '*We advocate for services where a need is identified*'. Ethics of care refers to our willingness to serve as advocates for individuals, families and communities. An ethics of care framework is in keeping with a relationships-based approach – at the heart of our professional work.

Cases such as the one outlined here remind our profession of the need to adopt a broader advocacy role for our clients, as they (and we) navigate the path to diagnosis and the best possible interventions and support. Greater recognition of DLD and its implications is a worthy and important goal.

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1 Not her real name
2 WACE: Western Australian Certificate of Education Year 12 exams
3 For the purposes of this article, only the CELF-4 scores have been reported, although the full battery included functional and discourse level language measures, and took into consideration a detailed history/background.

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Navigating the path towards diagnosis of DLD and evidence-based interventions and supports

A parent's perspective

Donna Dancer

Donna Dancer

I was concerned right from birth that all was not right with my child's communication as she did not cry. The perfect baby! But she was my second child, so my mother's instinct told me things were not as they should be. She had no voice or idea how to make a sound, and I actually thought she was deaf in my ignorance of how deaf babies present. My child was constantly sick and on antibiotics for ear, nose and throat issues. These ENT health issues were always blamed by our GP for her global delay. At 18 months of age, she was grunting and pointing to make herself understood, and she was very keen to communicate and interact with the family.

I finally persuaded the doctor that I did not have post-natal depression and that in fact my child had issues. Getting a referral from our family GP to a paediatrician took 18 months. I was filled with nothing but relief when the paediatrician agreed with my concerns and referred my child to an early intervention centre. I had never heard of DLD but as I began to read and research (without the aid of internet 30 years ago!) I realised my child was presenting as a child with DLD. The speech pathologist at the early intervention centre introduced us to Makaton key word signs to facilitate communication and my child took to it immediately. I remember this time as being very positive as we were finally getting some help and we were dealing with a professional who was able to assist in communication.

Schooling and education became a huge issue for me as I wanted my daughter to be in an environment where her communication and other issues were not seen as a barrier to her interacting with other children and being part of the program. I researched daycare centres and kindergartens that had vacancies and were willing to accept a child with communication and co-ordination difficulties. The kindergarten I found had a speech pathologist on-site attached to the kindy program, who worked with the children individually as well as having a great deal of input into the program. It was this SLP who first made me aware of a parent support group which my husband and I joined immediately and which started our education into understanding language disorders. Learning about DLD was very important to us in our journey.

Our child started pre-school at a language development centre where she was supported for the next 7 years. The curriculum at this school was research based and adapted to enhance the development of language, literacy and numeracy in the students who had DLD. This wonderful school continues to cater for children with various language disorders in a small classroom setting. To my knowledge no similar school existed in Australia in the early 1990s. We feel so lucky that these professionals came into our child's life. The foundation and development of her language, literacy and numeracy that she received at this school is the greatest gift she has ever been given, and set her on the path that she still navigates today.

Donna Dancer is a community representative of the Speech Pathology Australia Ethics Board. In this column she reflects on her personal journal navigating the path to diagnosis and treatment for her daughter.

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Webwords 60

Developmental language disorder: #DevLangDis

Caroline Bowen

Developed by **RAND**[1] in the 1950s, the "deliberative tool" called the Delphi method is a forecasting technique, in which a panel of selected experts responds anonymously, in writing, to two or more rounds of carefully designed questionnaires. Following each round, panellists' input is aggregated by moderators (or facilitators) and then shared with the whole group. The experts, who usually include actors and stakeholders, and who may be geographically near to, or distant from each other, consider the views of the other panellists and are free to maintain, change, expand, or fine-tune their answers in successive rounds. Through this iterative process of co-construction, the panel endeavours to reach a common position, facilitating the creation of innovative solutions to complex problems.

The rapturous marketing hype for open source and commercially available e-Delphi software, commonly promises unanimity with glib slogans like "better solutions through collective intelligence" and "a proven way to harness wisdom". But as Cole, Donohoe, and Stellefson (2013) caution researchers, survey iteration can end in disagreement and no consensus.

CATALISE

Through dedication and persistence, **CATALISE**[2], the 2016–2017 multiple part Delphi into children with unexplained language problems, led by Dorothy Bishop, did not suffer such a disappointing fate. Between them, two facilitators and 57 panellists maintained enthusiasm for the project, achieving 80% consensus around key goals. They also gained new perspectives on international and interdisciplinary viewpoints and concerns, while pinpointing areas of indecision, such as uncertainty among ASHA members over the wisdom and practicality of abandoning the term *specific language impairment* (SLI) in favour of *developmental language disorder* (DLD) ... or not.

The panel began with the people who were asked to write commentaries for an *International Journal of Language & Communication Disorders* special issue on The SLI Debate (Ebbels, 2014) and all co-authors of articles therein, except for the Delphi moderators, psychologists Dorothy Bishop and Maggie Snowling. Ebbels (2014) and Bishop et al. (2016) highlight the reasons for, and pitfalls of division around terminology for language disorders, building towards the Bishop et al. (2017) proposal for standard definitions and nomenclature to be applied around the world.

The experts were drawn from ten disciplines or agencies (including audiology, charities, child psychiatry, education, paediatrics, psychiatry, and psychology, with a predominance of SLP/SLT clinicians and/or researchers) from the six MRA **signatory**[3] countries: Australia, Canada, Ireland, New Zealand, the UK and the US. Their goal in phase 1, round 1 (Bishop, Snowling, Thompson, Greenhalgh, & The CATALISE Consortium, 2016) was to work towards agreed criteria for identifying children with language disorders who might benefit from specialist services. Accord was reached in round 2, resulting in a consensus statement, a summary of relevant evidence, and a commentary on residual disagreements and gaps in the evidence base (Bishop et al., 2016).
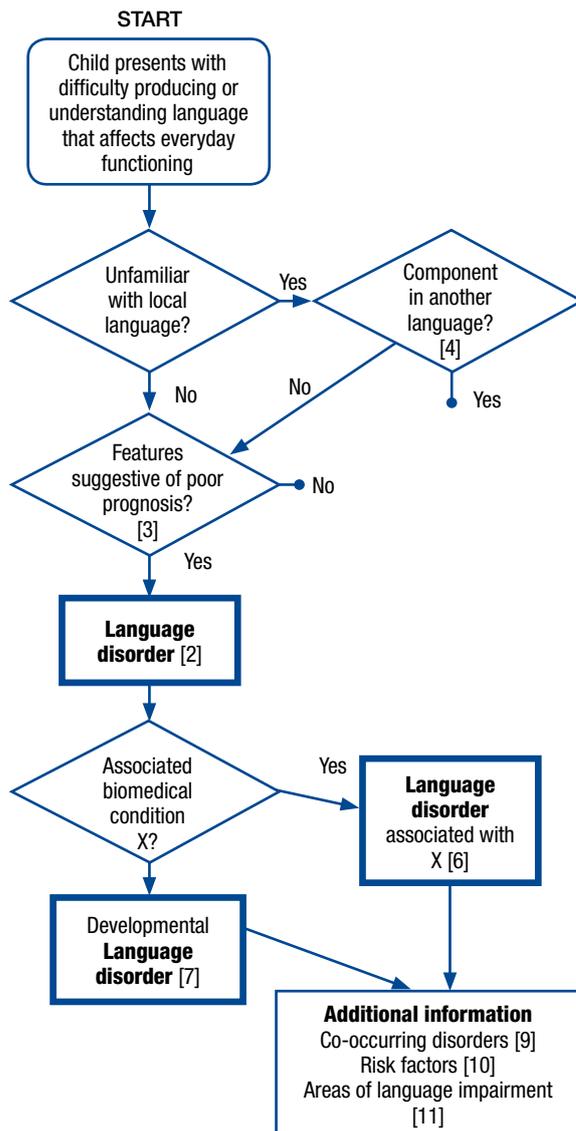
Diagnosing and describing DLD

Questions to consider in reaching a diagnosis of *language disorder* or *developmental language disorder* or *language disorder associated with X* are displayed as a flow chart in Figure 1, where the bracketed numbers correspond with the Statements in the Results of the phase 2 report (Bishop, Snowling, Thompson, Greenhalgh, & The CATALISE Consortium, 2017). In phase 2 the panel recommended that:

- the diagnosis "language disorder" be used to refer to a profile of difficulties, associated with poor prognosis, that cause functional impairment in everyday life.
- the diagnosis "developmental language disorder" (DLD, with the social media hashtag **#DevLangDis**[4]) be used when the language disorder was not associated with a known biomedical aetiology. Such aetiologies include, for example: (a) autism spectrum disorder (ASD), (b) language difficulties resulting from acquired brain injury (ABI), (c) acquired epileptic aphasia in childhood, (d) certain neurodegenerative conditions, (e) genetic conditions such as Down syndrome, (f) cerebral palsy, and (g) oral language difficulties associated with sensorineural hearing loss.
- The diagnosis "language disorder associated with X" (with "X" representing one, or more, of the above conditions), be used when the language disorder was associated with a known biomedical aetiology, for instance, "language disorder associated with ABI" or "language disorder associated with Down syndrome and ASD" (see Bishop, 2017 for discussion).

It was further agreed that:
- the (a) presence of neurobiological or environmental risk factors does not preclude a diagnosis of DLD, (b) DLD can co-occur with *other neurodevelopmental disorders*,

Figure 1. Questions to consider in reaching a diagnosis of "Language Disorder" or "Developmental Language Disorder" or "Language Disorder associated with 'X'".
Used by permission of D. V. M. Bishop

and (c) DLD does not require a mismatch between verbal and nonverbal ability:

– risk factors might include, singly or in combination: family history, being male, living in poverty, having parents with low levels of education, and experiencing neglect or abuse;

– other neurodevelopmental disorders may involve, singly or in combination, difficulties with attention (e.g., ADHD), motor function (e.g., dyspraxia/developmental coordination disorder, dysarthria), literacy (see Snow, 2016 for discussion), speech, executive function, adaptive behaviour, behaviour problems, auditory processing, and intellectual function.

• the term *speech, language and communication needs* (SLCN) be retained as a broad category that includes all children with speech, language or communication difficulties, for any reason.

Speech language and communication needs

Figure 2 is a slightly modified (by the author) version of a Venn diagram (Figure 2 in the CATALISE Phase 2 Report

[Bishop et al., 2017]), showing where DLD, language disorder, and language disorder associated with X, fit in the SLCN schema. The term SLCN is most strongly associated with care, education and speech and language therapy practice in the UK (Dockrell, Howell, Leung, & Fugard, 2017), Ireland (IASLT, 2017), and the Metropolitan Region of the Department of Education and Training in Queensland, with occasional use in New Zealand. It came as a surprise, therefore, to find it prominently displayed in Speech Pathology Australia's useful ***Speech Pathology in Schools***[5] document, released in November 2017, and citing the 2016 pre-print of a short report of a Delphi conducted in the Netherlands (Visser-Bochane, Gerrits, Reijnevel, & Van der Schans, 2017). Is the small SLT/SLP world shrinking?

A RCSLT revision of the Venn diagram includes "language difficulties in under-5s with few risk factors" in the white dotted area alongside fluency disorders, voice disorders, and lack of familiarity with the ambient language. This was a response to general concern among college members that these children, who take up many SLT hours, appeared to have been overlooked.

Dockrell et al. (2017, p. 2) explain that in England, the 2001 Special Educational Needs' (SENs) Code of Practice included a category "Communication and interaction", subdivided into SLCN and autism spectrum disorders (ASD). SLCN refers to children whose primary need is reflected in their oral language and excludes sensory impairment, cognition, ASD, or a specific learning difficulty. They note that educators and SLTs conceptualise the term differently from each other, with SLTs applying SLCN to a broader group of children (Dockrell, Lindsay, Roulstone, & Law, 2014), and that teachers greatly value profiling of a child's difficulties, finding descriptions significantly more useful than a formal diagnosis. The 2001 categorisation of SENs was retained in the 2015 revision of the code, which included a new requirement for health, education, and care personnel to work together to enhance joint outcomes (Department for Education, 2015).
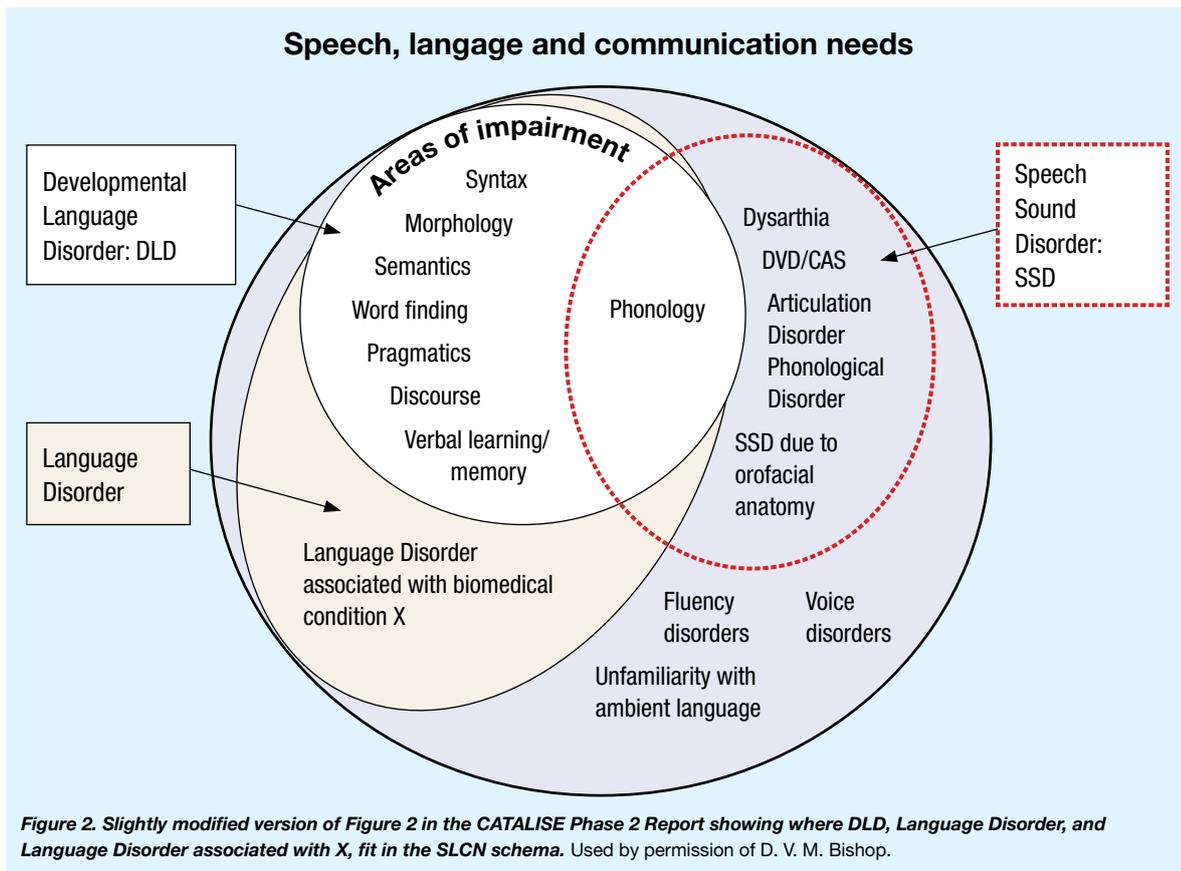
"Language"
Communicating with teachers

Speech-language pathologists Patchell and Hand (1993) produced, for a readership of teachers, an easy-to-understand language disorders' explainer for the *Independent Education* magazine. The piece contains a simple description of the terminological barriers to teacher–SLP/SLT collaborative partnerships, which persist. Chief of these was teachers' and SLPs'/SLTs' different conceptualisations of the word "language". Apart from the advice to "evaluate learning styles" (Howard Gardner's multiple intelligences work was popular in education at the time, but see Gardner, 2003) the authors' advice for modifying teacher talk, and classroom work, to assist students with language disorders, are probably as useful to teachers now as they were a quarter of a century ago. The advice included a call for high school teachers to "routinely talk with significant others; parents, special education teacher, speech pathologist, counsellor, etc., when students [with language disorders] have problems" (p. 7).

Communicating with families and interested others

If teachers and SLPs/SLTs unwittingly talk at cross purposes, mixing terminology in confusing ways, when they

Speech, langage and communication needs

Areas of impairment

Syntax
Morphology
Semantics
Word finding
Pragmatics
Discourse
Verbal learning/ memory

Phonology

Dysarthia
DVD/CAS
Articulation Disorder
Phonological Disorder

SSD due to orofacial anatomy

Developmental Language Disorder: DLD

Language Disorder

Speech Sound Disorder: SSD

Language Disorder associated with biomedical condition X

Fluency disorders

Voice disorders

Unfamiliarity with ambient language

Figure 2. Slightly modified version of Figure 2 in the CATALISE Phase 2 Report showing where DLD, Language Disorder, and Language Disorder associated with X, fit in the SLCN schema. Used by permission of D. V. M. Bishop.

engage with families and others, communication will break down. Parents, media, and the public have an understanding of labels like ADHD, autism, cerebral palsy, Down syndrome, dyslexia, and hearing impairment, but despite its high incidence most have not heard of SLI. As terms, language disorder, and developmental language disorder are more readily understandable for families, funding bodies, and decision-makers than "specific language impairment" ... provided they know what "language" means in this context. All the more reason, then, for SLPs/SLTs to embrace the new terminology and actively raise awareness of DLD in the world community, including in the news, current affairs and social media.

Raising awareness of developmental language disorder: #RADLD

The inaugural DLD Awareness Day, with the hashtag #DLD123, was on 22 September 2017. It was marked by functions at University College London, the University of Sydney, and other locations worldwide, and coincided with the publication of a special issue of the *Journal of Child Psychology and Psychiatry* (JCPP), edited by **Courtenay Norbury**[6], devoted to DLD, **a new video**[7] from the freshly re-badged Raising Awareness of Developmental Language Disorder (RADLD) campaign (formerly the RALLI campaign), featuring the unstoppable Eddie and Dyls, and **another**[8] by the equally unstoppable Dorothy Bishop. Thanks to Becky Clark and others, the RADLD Campaign has a fun, informative and interesting **YouTube channel**[9], and tweets via @RADLDcam.

Hot on the heels of the awareness day came the publication of the well-referenced, plain-English DLD page in Wikipedia, co-authored in true Wiki tradition (Bowen, 2012), by authorities in the field. It begins with a clear definition of the disorder:

Developmental Language Disorder (DLD)[10] is identified when a child has problems with language development that continue into school age and beyond. The language problems have a significant impact on everyday social interactions or educational progress, and occur in the absence of autism spectrum disorder, intellectual disability or a known biomedical condition. The most obvious problems are difficulties in using words and sentences to express meanings, but for many children, understanding of language (receptive language) is also a challenge, although this may not be evident unless the child is given a formal assessment.

Also in awareness-raising mode, Ebbels, McCartney, Slonims, Dockrell, and Norbury (in review, 2017) make a powerful case for evidence-based service delivery for children with language disorders. Their aims were to examine evidence of intervention effectiveness for children with language disorders at different tiers, and evidence regarding SLT roles; and to propose an evidence-based model of SLT service delivery. They write,

where prioritisation for clinical services is a necessity, we need to establish the benefits and cost-effectiveness of each contribution. Good evidence exists for SLTs delivering direct individualised intervention, and we should ensure that this is available to those children with pervasive and/or complex language impairments. In cases where service models are being provided which lack evidence, we strongly recommend that SLTs investigate the effectiveness of their approaches... Ineffective services are wasteful of limited resources and time (including the time of SLTs, parents, education staff, and the children themselves) and yet there is evidence that SLTs frequently fail to use evidence-based interventions, preferring

to use their own local methods (Roulstone, Wren, Bakopoulou, Goodlad, and Lindsay, 2012). While clinical decisions may be a response to local need, resources, and priorities, SLTs should be clear how these differ from evidence-based interventions and collect data to establish whether they are effective in achieving their aims. (p. 17)

Children with complex and pervasive language disorder and those with additional complex needs require the specialist skills of SLTs in order to make progress. SLTs need to have adequate time to work directly and collaboratively with these children, their families and educators, to improve their skills and reduce the functional impact of their language disorder." (p. 18)

To DLD or not to DLD? That is the question

Of the MRA associations, the Irish Association of Speech and Language Therapists (IASLT), the Royal College of Speech and Language Therapists (RCSLT), and Speech Pathology Australia (SPA) were quick to respond to the CATALISE recommendations, and ran with the new DLD terminology, preferring it to SLI. Speech-Language & Audiology Canada (SAC-OAC) and the New Zealand Speech-language Therapists' Association (NZSTA) were discussing possible "official positions" at the time of writing. The largest of the associations, the American Speech-Language-Hearing Association (ASHA) with its 191,500 members and affiliates, has not thrown its hat into the ring in an official sense, yet. There has been plenty of SLI vs. DLD discussion, however, among ASHA members, with billing codes and insurance pay-outs emerging as apparently intractable sticking points.

A rock and a hard place

One of the difficulties with terms such as SLI and language delay is that they have literal interpretations that are not consistent with what we know about children with these problems. (Kamhi, 1998, p. 36)

Unsurprisingly, private health insurers decide who will and will not be insured, who will and will not receive reimbursement for services, and for which diagnoses (or insurance codes), even when they do not fully understand the diagnostic nuances of disorders for which there is no biological test, like blood, urine, or chromosome studies. Similarly, public health care financing is driven by people who may not "know about" children with language disorders. As discussed above, educators and SLPs/SLTs conceptualise "language" differently from each other (Patchell & Hand, 1993), and there are significant differences in terminology-related practical considerations for speech-language professionals in different parts of the world. An example of the latter is the parting of the ways between *developmental verbal dyspraxia* (DVD), the term used in the UK and recommended by the RCSLT, and *childhood apraxia of speech* (CAS), the term used in the US and recommended by ASHA, because US insurance companies do not pay out for anything earmarked *developmental*. *Childhood* is insurance-friendly; "developmental" is not, even though "childhood" indicates that a disorder becomes apparent in childhood, and "developmental" indicates exactly the same thing.

Australian, British, Canadian, Irish, and New Zealand motor-speech disorders researchers can, and do, use CAS in their publications, and clinicians can use it in all facets of practice, partly because there are no potentially undesirable repercussions for clients if they do (and also to support the cause of consistent terminology across national boundaries), but the reverse is not true. You just don't find American clinicians, or academics using DVD, with only a smattering of them using DLD at this time. Fortunately, that does not mean that there are no signs of change. For example, it is heartening to see @ASHAjournals and @SIGperspectives Tweeting the hashtag #DevLangDis, and @s_redmondUofU, @mcgregor_karla, @Shar_SLP, @SlpSummer, @kimberlyslp, @hstorkel, @ecoleSLP, @lfinestack, @TELLlab, @9wyneth, @kush_stephanie, @staceypalant, and other ASHA members with #DevLangDis or #DLD123 in their Twitter bios.

Clinicians in private practice in the United States are between a rock and a hard place in deciding whether to stay with SLI or to transition to DLD as their preferred diagnostic term. They want to serve their clients responsibly, effectively and ethically, and as part of that process they will want to ensure that they tick all the boxes so that their clients (or their parents) receive unambiguous invoices and timely reimbursement. They may also believe that "terminology is important for more than insurance coding. It's also important for self-advocacy, arguing for increased research dollars, and for identifying reliable treatments/approaches to resolving the challenges posed by the disorder" (Sean Redmond, Language Section Editor-in-Chief, *JSLHR*, personal correspondence, 7 Nov 2017).

Ethical practice and evidence-based practice are inseparable. If practitioners infer from the literature that lack of consensus about terminology leads to confusion and impedes both research and children's access to appropriate services (Bishop, 2014), and they simply *like* the CATALISE recommendations, then they might feel the urge to join the majority (of associations; not the majority of SLPs at this point) and apply DLD as a diagnosis. But if they do, the financial penalty for clients is instantaneous. In turn, their incomes are set to suffer as the word gets around that the SLP concerned does not apply "conducive", insurance-friendly terminology.

DLD, DVD, SLI and CAS are abbreviations for communication disorders that do not dissipate over time; they can be managed and ameliorated with appropriate intervention, but they persist for a lifetime. Most researchers and practitioners will agree that DLD cannot be "cured", and language "normalised" through therapy. Rather, clinicians aim realistically, without setting their sights too low by underestimating what they and the child can do, to improve functioning, while acknowledging that the forecast is for long-term difficulties.

Wishlist

Webwords' wishlist for the near future is to see:
- the professional associations, ASHA, NZSTA, SAC-OAC, and others, embrace and endorse the new DLD terminology, as IASLT, RCSLT and SPA have done, encouraging their members to use it;
- inclusive, open discussion between stakeholders, about intervention goals and expectations. Should the primary goal for children with DLD be to narrow, or even close, the gaps between their language performance and that of typical peers, or should we be focusing on achievable, functional outcomes? If yes, how should

those outcomes be measured, and what should the (collaborative) professions be saying to families?;

- the unhelpful delay vs. disorder dichotomy being shown the door;
- political lobbying, at the local, national and international levels, for better provisioning for children, young people, and adults with DLD;
- increased understanding of DLD and its implications, including general community awareness that early literacy difficulties and language disorder are highly correlated.

For the medium-term:

- Research, including high-quality randomised controlled trials where practicable, leading to clearer pictures of: what "effective" intervention looks like; the impact of DLD on children (Levickis et al., 2017); the impact of DLD in adulthood; and when in development intervention will have most impact. Is there an age, stage or window in which children will progress "faster" in response to intervention? Is there a critical level of intervention: what dosage (frequency and intensity) of intervention is optimal?
- Research into intervention with children with DLD associated with comorbidities, and children with low IQs; and, more collaborative research partnerships between clinicians, educators, psychologists and researchers.
- Research studies of the cascading effects of language therapy on other areas of development and function; for example, does language intervention improve social, emotional and behavioural functioning (Levickis et al., 2017)?

For the longer term Webwords would like to see:

- research literacy as a "given" attribute of all members of the profession, wherever and whenever they trained. Only SLPs/SLTs who are critical consumers of research are in a position to clearly understand intervention studies and to see their applicability to practice. This means that all training institutions must include research methodology, experimental design, statistics and logic in their curricula, in sufficient depth;
- improved ease of access, for clinicians, to free or affordable high quality research.
- time to read new literature timetabled into practitioners' workload, and not something that has to be done after-hours.

A well-known quotation, usually attributed to Margaret Mead, goes: "Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it's the only thing that ever has" (Mead, cited by Lutkehaus, 2008, p. 261). Philosopher Joshua A. Miller's entertaining reworking of it is in Figure 3, and related discussion is in his **blog**[11], where he writes:

Paying attention to the effects of small-group politics seems naive, since big, impersonal social forces probably have more impact on outcomes. Academic "realism" marginalizes human agency. But small-group politics is morally important – it's what we should do. It's also more significant than the "realists" believe, although less powerful than Margaret Mead implied. (Miller, 2011)

Strategic lobbying

Webwords has one more wish (for now) and that is for SLPs/SLTs to be more politically astute, active, and aware of opportunities to impact public policy, and more actively supportive of those who are already trying. The CATALISE
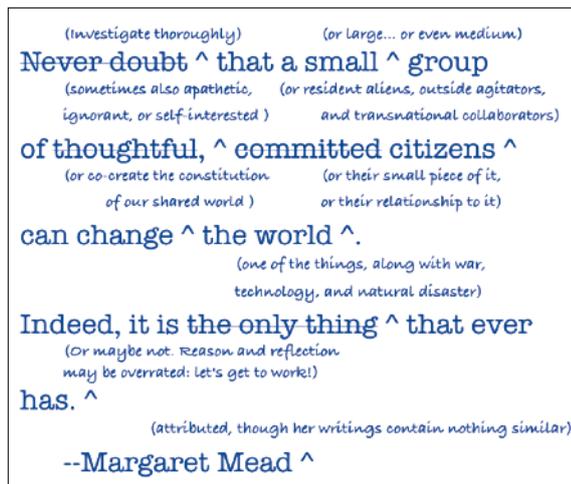

Figure 3. Margaret Mead Revisions, Miller, 2011

Delphi provides the perfect springboard for effective **lobbying**[12], which would see the profession, globally, and its agents applying a range of strategies designed to develop and/or realign policy around DLD, by influencing government (including regulators), consumers, and the public.

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Links

1. https://www.rand.org/topics/delphi-method.html
2. https://www.rcslt.org/clinical_resources/docs/revised_catalise2017
3. https://www.asha.org/certification/MultilateralMRA/
4. https://twitter.com/search?f=tweets&vertical=default&q=%23DevLangDis&src=typd
5. https://speechpathologyaustralia.cld.bz/Speech-Pathology-in-Schools-2017
6. https://www.youtube.com/embed/KWVibpPH1Uk
7. https://www.youtube.com/watch?v=tQ-s02HWLb0&feature=youtu.be
8. https://www.youtube.com/watch?v=OZ1dHS1X8jg
9. https://www.youtube.com/radld
10. https://en.wikipedia.org/wiki/Developmental_language_disorder
11. http://www.anotherpanacea.com/2011/07/what-can-small-groups-do/
12. https://theconversation.com/au/topics/australian-lobby-groups-28197

Webwords 60 is at www.speech-language-therapy.com with live links to featured and additional resources. All the journal articles and policy documents cited are linked to full text, open or free access versions.

Around the journals

Emily Dawes

This article reports on the second phase of a consensus study investigating criteria and terminology for language difficulties. This second phase aimed to provide consensus for terminology used refer to unexplained language difficulties. A panel of 57 English-speaking members (the CATALISE Consortium) participated in the study. The majority of the panel were speech pathologists, with the remainder of the panel psychologists, pediatricians, charity representatives, specialist teachers, a psychiatrist, and an audiologist. Nine of the panel members had a close relative with language difficulties. The authors acted as moderators during the process and organised the study methodology.

A process called the Delphi method was used, in which sets of statements are rated in an iterative process. The study aimed for the statements to reach at least 75% agreement. First, a set of statements about terminology were rated by the panel using a 5-point scale (1 *strongly disagree* to 5 *strongly agree*). Second, the panel members viewed other panel members' ratings of the statements anonymously. During this stage, the panel members could modify their initial ratings or provide further rationale for their view/s. A meeting was held with panel members and additional stakeholders (who represented similar backgrounds to the panel) in which the ratings and statements were discussed. The study moderators subsequently revised and reworded some of the statements. Then the statements were again rated and commented on by the panel. At this stage, 19 of the 21 statements had agreement of 78% or more. Two items, which involved terms for subtypes of language disorder, had lower agreement (46% and 68%), which indicated that they needed to be revised or removed. Finally, the statements were revised by the moderators based on the panel comments. These were provided to the panel for final comments and approval, and again revised to provide 12 finalised statements agreed by the panel.

The main body of the article presents the final consensus statements with additional comments, discussion, and references.

Statement 1: It is important that those working in the field of children's language problems use consistent terminology.

The lack of consistent terminology for children's language difficulties is the reason for the CATALISE studies, and has been recognised as a major issue in research and clinical practice.

Statement 2: The term "language disorder" is proposed for children who are likely to have language problems enduring into middle childhood and beyond, with a significant impact on everyday social interactions or educational progress.

The authors note that prognosis is a key factor, in that language disorder involves significant functional impairments which are unlikely to resolve without specialist support. Additionally, the term "disorder" was selected due to its connotations of seriousness and importance, consistency with other neurodevelopmental disorders (e.g., autism spectrum disorder), and compatibility with diagnostic systems (such as the *Diagnostic and Statistical Manual of Mental Disorders*).

Statement 3: Research evidence indicates that predictors of poor prognosis vary with a child's age, but in general language problems that affect a range of skills are likely to persist.

The indicators of prognosis vary by age, and prediction of outcome for children under 3 years is particularly difficult. Prediction of outcome improves from 4 years of age, with problems still evident at 5 years being more likely to persist over time.

Statement 4: Some children may have language needs because their first or home language differs from the local language, and they have had insufficient exposure to the language used by the school or community to be fully fluent in it. This should not be regarded as language disorder, unless there is evidence that the child does not have age appropriate skills in any language.

This statement is particularly relevant in Australia, and reminds clinicians to consider culture and language; particularly in the interpretation of assessment results (i.e., a low score does not necessarily indicate that the child has a disorder).

Statement 5: Rather than using exclusionary criteria in the definition of language disorder, we draw a threefold distinction between differentiating conditions, risk factors and co-occurring conditions.

The use of exclusionary criteria, particularly as criteria for excluding children from services, has previously been a significant issue in relation to terminology for language disorder.

Statement 6: Differentiating conditions are biomedical conditions in which language disorder occurs as part of a more complex pattern of impairments. This may indicate a specific intervention pathway. We recommend referring to "Language disorder associated with X", where X is the differentiating condition, as specified above.

Differentiating conditions in which there is common co-morbidity with language disorder include autism spectrum disorder, intellectual disability, genetic conditions

(e.g., Down syndrome), brain injury, acquired epileptic aphasia, cerebral palsy, sensori-neural hearing loss, and some neurodegenerative conditions.

Statement 7: The term Developmental Language Disorder (DLD) is proposed to refer to cases of language disorder with no known differentiating condition (as defined in Statement 6). Distinguishing these cases is important when doing research on aetiology, and is likely also to have implications for prognosis and intervention.
While there were objections to the use of the term "developmental", the authors note that it was chosen because it indicates that the disorder arises during the course of development (i.e., it is not acquired or associated with a known biomedical cause). The term "developmental" may be dropped as individuals grow older.

Statement 8: A child with a language disorder may have a low level of nonverbal ability. This does not preclude a diagnosis of DLD.
A discrepancy between language ability and nonverbal ability is not required for diagnosis. Children with low nonverbal ability who do not meet the criteria for intellectual disability can be given a diagnosis of DLD. Children who present with DLD and meet the criteria for intellectual disability may be diagnosed with DLD associated with intellectual disability.

Statement 9: Co-occurring disorders are impairments in cognitive, sensori-motor or behavioural domains that can co-occur with DLD and may affect the pattern of impairment and response to intervention, but whose causal relation to language problems is unclear. These include attentional problems (ADHD), motor problems (developmental coordination disorder or DCD), reading and spelling problems (developmental dyslexia), speech problems, limitations of adaptive behaviour and/or behavioural and emotional disorders.
Many children with DLD, particularly in the clinical setting, present with a mixture of difficulties which may be labelled differently depending on the professional. As such, DLD can be diagnosed in the presence of other neurodevelopmental disorders.

Statement 10: Risk factors are biological or environmental factors that are statistically associated with language disorder, but whose causal relationship to the language problem is unclear or partial. Risk factors do not exclude a diagnosis of DLD.
Common risk factors in children with DLD include family history of DLD or dyslexia, male gender, being a younger sibling in a large family, and lower levels of parental education.

Statement 11: Developmental language disorder is a heterogeneous category that encompasses a wide range of problems. Nevertheless, it can be helpful for clinicians to pinpoint the principal areas for intervention, and researchers may decide to focus on children with specific characteristics to define more homogeneous samples for study.
Good agreement on terminology for subgroups was not met during the Delphi consensus process. While a number of studies have aimed to develop a classification of subtypes in DLD, the subtypes have not been clearly replicated and have not been shown to be consistent over time. This aligns with the finding that there are no clear-cut divides between typical language development and

language disorder. As such, assessment should focus on identifying the primary areas of language difficulty. These may include expressive and/or receptive difficulties in grammar and syntax, word-finding and semantics, pragmatics, discourse (particularly narrative), verbal learning and memory, and phonology (but not motor speech or articulation issues). Children with language disorder plus speech production issues related to motor/articulation may have a dual diagnosis of DLD plus speech sound disorder).

Statement 12: It can be useful to have a superordinate category for policymakers, because the number of children with specific needs in the domain of speech, language and communication has resource implications. The term Speech, Language and Communication Needs (SLCN), already in use in educational services in the United Kingdom, is recommended for this purpose.
A broad term which encompasses DLD and other communication difficulties (e.g. stuttering, apraxia, etc.) is useful as it provides recognition of children who have communication needs that may require extra support, even though they may not have DLD.

The article concludes with a general discussion relating to the consensus research, including why the term "specific language impairment" was not selected. The authors highlight that diagnosis of DLD should not be based solely on standardised assessment cut-offs, as it is critical to consider functional communication. The study was limited to the English language and the authors recommend the Delphi method be used to achieve terminology consensus in other languages.

Overall, this article provides clear, clinically useful information detailing the process and outcomes in reaching consensus on terminology for language difficulties. It is highly relevant for all clinicians and researchers working with children, adolescents, and adults with language disorders. It is important for clinicians to use the term "developmental language disorder" consistently to better support and advocate for clients, and to increase awareness of DLD in the community and across professionals working with this population. This article is on open access.

Ebbels, S. H., Wright, L., Brockbank, S., Godfrey, C., Harris, C., Leniston, H., . . . Marić, N. S. (2017). **Effectiveness of 1:1 speech and language therapy for older children with (developmental) language disorder.** *International Journal of Language & Communication Disorders*, *52*(4), 528–539. doi:10.1111/1460-6984.12297

Emily Dawes

This article presents an intervention study which investigated outcomes across speech and language for older children with developmental language disorder (DLD) attending a specialist school. The researchers aimed to determine whether the school's typical practice of 1:1 speech pathology intervention over a school term was effective and whether different factors, such as receptive language ability, intervention area, co-occurring autism spectrum disorder (ASD), or gender, affected students' response to intervention.

All speech pathologists who provided 1:1 intervention at the specialist school participated in the study. Seventy-two students aged 9 to 17 years (with a mean age of 13 years) participated in the study. A majority of the students

demonstrated receptive language difficulties (88%), a majority were male (72%), and a number also presented with a diagnosis of ASD (28%).

Each student had at least one individual intervention target chosen by their speech pathologist which was based on their specific needs, the views of the student, their parents, and teachers, and the potential functional impact of improvement related to the target. The speech pathologists created measures to assess the target and a control skill which would not receive intervention. The control measures were related skills which were not hypothesised to improve as a result of the intervention. The intervention targets covered a wide range of speech and language areas, including vocabulary and word-finding, grammar, narrative, social skills, phonological awareness, and speech sounds. Most of the targets focused on expressive and receptive language skills. Intervention sessions were generally 30 minutes and the speech pathologists chose how much time to spend on each target and how many weeks to focus on each target (the mean number of intervention hours per target was 4.2). The participants received intervention focusing on 1 to 3 intervention targets, with the majority of students (52%) focusing on two targets.

The participants performed similarly on both the target and control measures pre-intervention. Following the intervention period (one term), post-intervention assessments were carried out by speech pathologists blind to the intervention provided and who were not familiar with the participant. The results indicated that, while the participants showed improvement on both target and control measures, they made more progress on the target measures (30% improvement) than control measures (8% improvement) across all intervention areas. The improvement in target measures was significantly greater than control measures, with no significant differences found between the intervention target areas. The effect size for the targets was large and clinically significant ($d = 1.33$) while the control items' effect size was relatively small ($d = 0.36$). Of the goals set for each intervention target, 97 were rated as "achieved" and 23 were rated as "not achieved". The goals rated as "achieved" showed significantly more progress than those rated as "not achieved". Multiple regression analyses indicated that none of the hypothesised predictors (receptive language ability, ASD diagnosis, gender, and school Key Stage [educational level]) were significant predictors of intervention progress.

A limitation to this study is that no standardised measures were used; however, the measures used reflected functional intervention targets. Additionally, while a control group was not included, the use of control measures provided some experimental control. Overall, the study demonstrates that older children with DLD can make significant progress on a variety of intervention targets with individual therapy, regardless of receptive language difficulties, ASD diagnosis, gender, or educational stage. Little research has investigated intervention for older children with DLD, especially those with receptive language difficulties. Given the poorer prognosis of children with receptive language difficulties, these findings are highly useful for clinicians in demonstrating that, over one school term, 1:1 intervention for this population can result in clinically significant gains across a range of areas. The findings also emphasise the need to, and utility of, providing speech pathology services to older children and adolescents with DLD.

Norbury, C. F., Vamvakas, G., Gooch, D., Baird, G., Charman, T., Simonoff, E., & Pickles, A. (2017). **Language growth in children with heterogeneous language disorders: a population study.** *Journal of Child Psychology and Psychiatry*, *58*(10), 1092–1105. doi:10.1111/jcpp.12793

Emily Dawes

This article reports results from the Surrey Communication and Language in Education Study (SCALES) which investigated language stability and growth in children with typically developing language, children with DLD, and children with DLD associated with an additional diagnosis (such as intellectual disability or autism spectrum disorder). The study considered the influence of a large range of variables, including those related to the child (nonverbal IQ, diagnosis/es, and social, behavioural, and emotional problems) and those related to the child's environment (socioeconomic disadvantage).

The first phase of SCALES involved the completion of language and communication skills checklists on 7,267 children aged 4 to 6 years by class teachers from 263 public primary schools. A sample of the children were selected using stratified random sampling for in-depth assessment when aged 5 to 6 years and 7 to 8 years. The sampling selection was based on the teacher checklist report of the child having no phrase- or sentence-level language. Children attending specialist schools and those with English as an additional language were excluded from the study. A comprehensive assessment battery was completed with 529 monolingual English-speaking children aged 5 to 6 years, and 499 of those children completed follow-up assessment at 7 to 8 years. The assessment battery included measures of nonverbal ability, vocabulary, grammar, sentence repetition, and narrative retelling and comprehension.

The participants were separated into one of three groups. The Language Disorder-only (LD-only) group included children who scored 1.5 standard deviations or below on two of the five language composite measures, 2 standard deviations or higher for nonverbal ability (i.e., they did not present with an intellectual disability), and who did not present with an existing diagnosis. The Language Disorder-plus (LD-plus) group included children who met the same language criteria as the LD-only group, but who also presented with a nonverbal ability score at least 2 standard deviations below the mean and/or had an existing diagnosis. The children who did not meet the group criteria for LD-only or LD-plus were included in the typically developing (TD) group. Following the 5 to 6 year old assessment, 86 children met the criteria for the LD-only group, 45 met the criteria for the LD-plus group, and 389 met the criteria for the TD group.

Raw scores and z-scores were analysed. The raw scores allowed the researchers to determine whether total scores increased over time (reflecting language growth), whereas the z-scores (which take account of age) allowed the researchers to determine whether language ability was stable over time. The results of the raw score analyses indicated that language scores increased significantly over time (between 5 and 8 years of age). The rate of increase in raw language scores was significantly greater for the LD-only group compared to the TD group. The children in the LD-plus group demonstrated similar rates of language growth to the children in the TD group. Nonverbal ability, socioeconomic disadvantage, and social, emotional

and behavioural difficulties were significant predictors of language ability, but did not significantly impact the rate of language growth. Flat growth of z-scores was found in all three groups, indicating relatively stable language ability over time. This result indicated that neither the LD-only nor the LD-plus groups narrowed the gap in language with their TD peers. However, this also indicated that the LD-plus group did not show a widening gap in language ability compared to TD peers. Nonverbal ability, socioeconomic disadvantage, and social, emotional and behavioural difficulties did not significantly influence language stability between 5 and 8 years of age.

Overall, the results indicated that children with LD and LD plus other diagnoses demonstrated improvement in language over time, along with stability of language ability over time that was parallel to TD children. Importantly, the children with LD plus other diagnoses, who presented with the most significant difficulties, did not fall further behind their peers between 5 and 8 years. While children with LD-only demonstrated significantly greater growth in raw scores, this was not sufficient to narrow the language ability gap with TD children as measured by z-scores. The researchers reported that these findings may reflect that the TD group were reaching ceiling level on some of the language measures. This finding indicates that "accelerated" language growth in 5 to 8 year old

children with DLD, resulting in significant narrowing of the achievement gap with TD children, is unlikely. Another important finding from this study was that language growth across the groups of children was similar despite varying nonverbal ability, diagnosis/es, socioeconomic disadvantage, and social, emotional, and behavioural difficulties. Limitations of the study include that little information about intervention/s received, the home environment, and family history were collected.

In conclusion, this article provides useful and relevant information for clinicians and service providers working with children with DLD. The results highlight that, a) language ability was stable for the first three years of schooling in children with DLD both with and without other diagnoses; b) steady language growth which was parallel to typically developing children occurred between 5 and 8 years in children with DLD with and without other diagnoses; and, c) the rate of language growth was not influenced by nonverbal ability, other diagnosis/es, socioeconomic disadvantage, and social, emotional, and behavioural difficulties. In line with these findings, the authors noted that aiming to improve the language scores of children with DLD to the average range may not be realistic or achievable, so intervention should focus on functional goals which maximise the child's ability to participate, learn, and communicate. This article is on open access.

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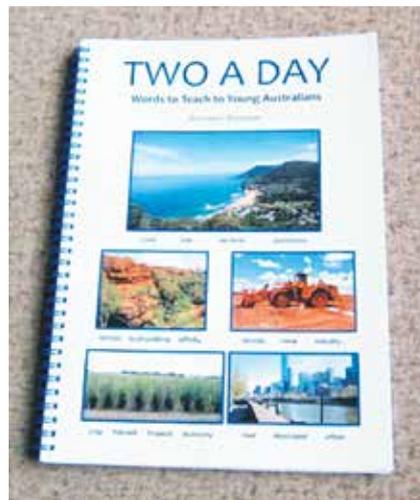
Resource review

Rachael Bongiascia

The need to explicitly teach vocabulary has come to the forefront of education discussion since the publication of the National Reading Panel (2000). The report indicated that vocabulary instruction played a vital role in ensuring children could understand and interpret the texts they were reading. The positive impact a robust vocabulary can have on academic development has continued to be reinforced throughout the last two decades. However, it can be challenging to identify which words to explicitly teach. The resource, Two a Day: Words to Teach Young Australians, aims to aid the selection process by providing a sequence of acquisition in the form of five wordlists for various ages.

The wordlists are based on a study of word knowledge of 78 students, ranging in age from 4;7–18;10, who lived in the Wollongong area of New South Wales. In order to establish reliable ages for word acquisition only the 52 students who scored within the average range of vocabulary knowledge, as determined by the Peabody Picture Vocabulary Test 4 (PPVT – 4), were used to establish the age-based wordlists. The words were selected from *The Macquarie Concise Dictionary* (3rd ed.). To establish the preliminary lists the author, Bronwyn Bryceson, removed all antiquated, controversial, technical and medical words as well as those which would, of necessity, already be taught at school. The finalised wordlists were established by presenting the words to the participants and then placing them in the list associated with the youngest age cohort who knew the word.

The introduction creates a strong argument for the implementation of a systematic and explicit approach to the teaching of vocabulary, while also acknowledging the limitation of the wordlist and guiding the reader to other resources that detail how to implement a robust program. The wordlists themselves provide a good reference for those familiar with the implementation of vocabulary instruction. However, caution needs to be taken when using this resource. The pre-school list in particular contains words which do not usually require direct instruction, such as *a* and *sit*. Moreover, the decontextualised nature and alphabetical presentation of the wordlists could lend the resource to be used inefficiently.

Overall, the resource provides a good reference of appropriate words to teach children at various ages; however, thought needs to be given to how to contextualise the word in order to create a meaningful and effective learning experience for the students.

Top 10 resources

Working with DLD in schools

North East Metro Language Development Centre (NEMLDC)

We are a team of speech pathologists working at the North East Metro Language Development Centre (NEMLDC). The NEMLDC is a specialised kindergarten to year 2 school in WA specifically for children with developmental language disorder (DLD).

About DLD

1   DLD textbook

One of our most recent go-to sources for information on children with DLD has been the book *Children with Specific Language Impairment* (Leonard, 2014). This book has been a valuable asset to our team and has been so useful that many of us have purchased it personally!

General intervention approaches and strategies

2   Gradual release of responsibility

One of the main strategies that we use in intervention (and which forms the foundation of our teachers' instruction) is the gradual release of responsibility model. Our students need a lot of scaffolding and modelling before being able to independently complete learning tasks. The gradual release of responsibility model can be summarised in 3 main steps: I do, we do and you do.

I do

Show the children how to complete the task, making sure that they are watching and listening. Think out loud, verbalising the strategies being used to complete the task, e.g., "I'm going to break 'man' into sounds. I'm going to say the word really slowly to help me. Mmmmmmmm-aaaaaaa-nnnnn. The sounds in 'man' are m-a-n."

We do

Practise the task with the children a few times, reiterating the strategies that can be used before and during this joint model. Give the children feedback and scaffolding as needed.

You do

Release the children to complete the task by themselves. Continue to provide feedback and scaffolding as needed.

Key read

For more information and a great summary for educators on the principles behind this approach look at "Principles of instruction: Research-based strategies that all teachers should know" by Rosenshine (2012) – on open access.

3   Think alouds

Think alouds are a process where the speech pathologist or educator verbalises the strategies or thought processes to be used. The children with DLD we work with often find it difficult to infer these strategies and processes. As such we make the implicit explicit for them by talking out loud our thought processes, e.g., "I'm going to describe a koala. I'm going to think about what type of animal it is, what it looks like and where it lives. A koala is a type of animal. It has…" Think alouds form an important part of the "I do" and "we do" in the gradual release of responsibility model.

Key read

For a great read on how think-alouds can be used, check out "the ABCs of performing highly effective think-alouds" by Block (2004).

4   Visual supports and graphic organisers

Visual supports and graphic organisers are important teaching tools that we and the teachers in the NEMLDC use to help our students with DLD. We use graphic organisers and visuals in most areas of teaching, including:

- **semantics**, e.g., icons representing the various features that can be described, compared and used for grouping; Venn diagrams, t charts and mind maps for showing relationships between ideas (See Figure 1)
- **literacy**, e.g., Elkonin boxes for sounding out, a picture of a caterpillar with a head that changes colour to illustrate the concept of rhyme – the first part of the word changes while the "tail" of the word stays the same (see figures 2 and 3)
- **narrative**, e.g., icons to highlight the macro parts of a text; story maps to highlight the use of specific microstructure (see Figure 4)
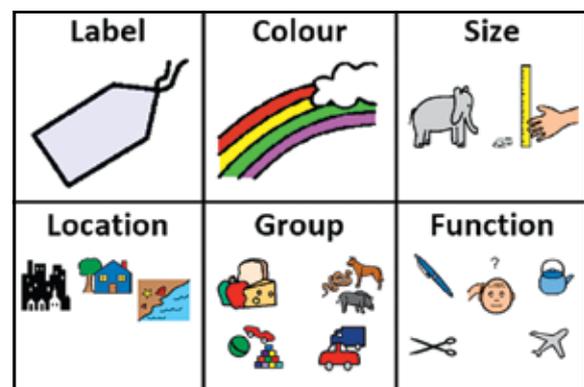

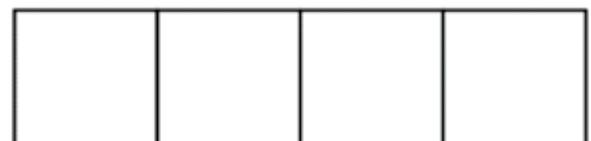*Figure 1. Describing icons (semantics)*
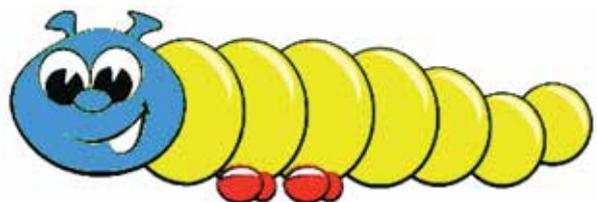

Figure 2. Elkonin boxes (literacy)
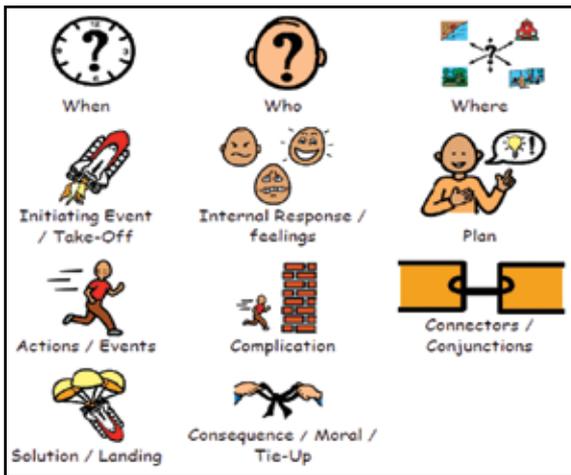

Figure 3. Rhyme caterpillar (literacy)

Figure 4. Fiction text icons (narrative)

Intervention approaches and resources for DLD

5   Narrative and book-based interventions

Book based intervention is a great way to target not only narrative, but also vocabulary and grammar (Petersen & Spencer, 2016). At the NEMLDC we base narrative, grammar and vocabulary instruction on a text, teaching each skill explicitly, particularly narrative macrostructure. We use icons to represent the different macrostructure elements of most genres. Our students with DLD often find it difficult to grasp abstract concepts like text parts, so giving them a tangible, concrete representation helps their understanding and ability to apply these parts to their self-generated texts.

Key resources

We use narrative macrostructure visual icons when reading books to students, as well as using them in story boards and planners to support students' comprehension and generation of texts (Figure 5 and Figure 6).

   We also use picture scenes as stimuli for story generation (as well as using these for description, as grammar and general language sample stimuli). Access free picture scenes from:

- *https://storybird.com/* create your own books (or just use single pictures)
- *https://www.onceuponapicture.co.uk/* hundreds of beautiful images with discussion questions
- *http://www.pobble365.com/* an image per day with story starters, sentence challenges and discussion questions.
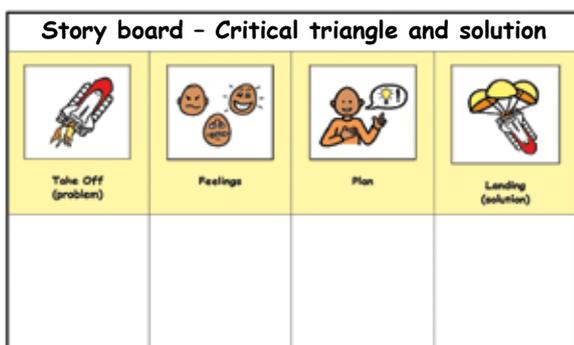

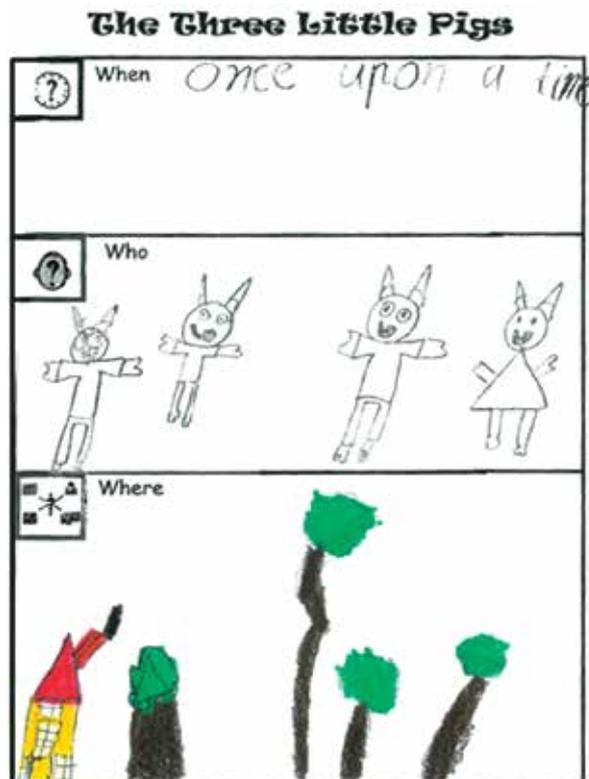*Figure 5. Storyboard for comprehension and planning*

Figure 6. Story planner – Setting

6   Explicit grammar instruction

Students with DLD often have a specific deficit in morpho-syntax (Leonard, 2014). At the NEMLDC we provide explicit grammar instruction to our students, often in the context of narrative. We use 'Colourful Semantics' (Figure 7) as well as 'Shape Coding' (when our clinicians have been trained) (See Ebbels, 2007) as tools to help us teach students the parts in sentences, the function they play and how they can fit together. This helps our students say and write more interesting and grammatically correct sentences.

   Colourful semantics resources can be downloaded from http://integratedtreatmentservices.co.uk/resources/colourful-semantics/

Figure 7. "Colourful semantics" in the classroom

7   Explicit/robust vocabulary instruction

Vocabulary acquisition is one of the most important elements for success in reading and comprehension. As well as providing students with implicit vocabulary learning

opportunities, we also teach vocabulary through explicit, robust vocabulary instruction. This is often done in the context of narrative to make learning functionally meaningful and relevant, using a combination of rich and basic vocabulary instruction.

We also use word study strategies like POSSUM where we talk about words from a number of perspectives. The POSSUM acronym represents the different perspectives we can examine a word from: **p**honology (e.g., how many sounds/syllables in the word); **o**rthography (e.g., how many letters? are there digraphs?); **s**emantics (e.g., word meaning, antonyms/synonyms of the word), **s**yntax (e.g., what word type is it? put the word in a sentence), **u** (personal link to the word); and **m**orphology (e.g., base/root words, what happens to the word when you add an affix?).

Key read

The textbook *Bringing Words to Life* by Beck, McKeown, and Kucan (2013) has been extremely helpful in helping us teach vocabulary well. For more information about vocabulary instruction with children with DLD, you could also read Steele and Mills (2011) – free access.

Resources for parents

8 DLD awareness

We continue to educate our school's body of parents, as well as the teachers of the LDC and our mainstream counterparts about DLD – what it is, how prevalent it is, how it presents and the impact it has on children's lives. In this age of technology and social media we have found the RADLD and #DLD123 campaigns very helpful in supporting this education. In particular we have used the RADLD (formerly RALLI) videos to show parents and teachers the impact that DLD has across the years (https://www.youtube.com/user/RALLIcampaign). As we work mostly with lower primary aged children it has been useful to give parents insight into the long term impacts (successes and difficulties) of children with DLD.

9 Intervention evidence

It can be hard for families to know what good intervention is and what it is not, especially with all sorts of information freely available on the internet. Parents and teachers often ask us about various intervention approaches that they have heard of and think might be suitable for their children. We have found the book *Making Sense of Interventions for Children with Developmental Disorders* by Bowen and Snow (2017) a very valuable resource to help us, our teachers, and the school's parent body navigate the world of intervention and distinguish robust, evidence-based approaches.

10 Bookshare resources

Sharing books is such a powerful way to encourage language growth. There are hundreds of books out there and navigating the plethora of books available can be tricky for families. We have found a few websites very useful to help us and our school's parent body find good quality, language rich books which particularly lend themselves to children's specific goals. The following websites are examples:

- *http://booksharetime.com/* an excellent, user-friendly, searchable booklist developed by speech pathologist, Cecile Ferreira
- *http://www.banterspeech.com.au/books-with-verbs-to-level-up-your-childs-language-development-24-of-the-best/* a very helpful collation of books to support verb development
- *http://www.banterspeech.com.au/more-verb-charged-books-to-ignite-your-childs-language-development/* further book suggestions to support verb development

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JCPSLP notes to authors

The *Journal of Clinical Practice in Speech-Language Pathology* is the major clinical publication of Speech Pathology Australia. Each issue of *JCPSLP* aims to contain a range of high quality material that appeals to a broad membership base. *JCPSLP* is published three times each year, in March, July, and November.

Issue	Copy deadline (peer review)	Theme*
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Number 1, 2019	1 August 2018	The roles of speech-language pathologists in the justice system
Number 2, 2019	1 December 2018	Measurement and evaluation in practice
Number 3, 2019	13 April 2019	Multimodal communication
Number 1, 2020	1 August 2019	TBA
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* articles on other topics are also welcome

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Material submitted must be your original work. Any direct quotations or material used from other sources must be credited in full. If copyright clearance is required to use material included in your article, please supply evidence that this has been obtained.

Ethical approval

All manuscripts in which information about a person and/or organisation is presented must be accompanied by evidence of approval by an authorised ethics committee. This includes clinical insights, ethical conversations, manuscripts presenting the results of quality assurance and improvement activities within workplace settings, and research manuscripts.

Themes

Each issue of *JCPSLP* contains a set of articles relating to a particular theme, as well as a selection of articles reflecting broader speech pathology practice. The Editorial Board selects a theme for each journal, and these themes can be suggested by members of Speech Pathology Australia at any time. Manuscripts on any topic relevant to speech pathology practice can be submitted to *JCPSLP* at any time.

Length

Manuscripts must not exceed 3500 words (including tables and a maximum of 30 references). Longer manuscripts may be accepted at the discretion of the editor. It is highly recommended that authors contact the editor prior to submitting longer manuscripts.

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- Research: These are papers that describe research studies with clear clinical relevance. Research papers should include a review of the literature, aims/purpose of the study, outline of the method (including participants, data collection tools and analysis), and a clear discussion directed to a clinical readership.
- Literature reviews: These are papers that provide detailed reviews of literature relating to topics of clinical relevance. Literature reviews should include a description of the significance of the topic, an outline of the methods used to identify papers, a comprehensive critique of the literature, and a discussion of clinical implications (including directions for future research if applicable).

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- All text should be 12 point Times New Roman, double spaced (except figures and tables), left justified.
- A maximum of five levels of heading (preferable 2–3 levels) should be used:
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  2. Left-aligned, boldface, uppercase and lowercase heading
  3. Indented, boldface, sentence case heading with a period. Begin body text after the period.
  4. Indented, boldface, italicised, sentence case heading with a period. Begin body text after the period.
  5. Indented, italicised, sentence case heading with a period. Begin body text after the period.
- Please use the terms "speech-language pathology" and "speech-language pathologist" (abbreviated to SLP) throughout article.
- Do not include images within the text of the article – send photos as separate attachments, digital images should be of high quality and preferably be sent as uncompressed TIF or EPS images.
- Use only one space after punctuation, including full stops.
- Use a comma before "and" in a series of three or more items (e.g., "The toys included a ball, bucket, and puzzle)
- Clear and concise writing is best. Use short sentences and paragraphs and plain English. Please reduce bias in language as much as possible (i.e., avoid stereotypical terms, refer to participants, rather than subjects, and be sensitive to racial and ethnic identity).
- Reproduce any quotations exactly as they appear in the original and provide the page number(s) for the pages you have quoted from.
- References, which should be key references only, must follow the American Psychological Association (APA, 6th edition) (2009) style. For further details on correct referencing, visit http://owl.english.purdue.edu/owl/resource/560/01/
- Tables and figures: If there are to be tables or figures within your article, these should be presented on separate pages with a clear indication of where they are to appear in the article (in text indicate where the figure or table should be inserted). All tables and figures should be numbered. Figures should be presented as camera-ready art. Please ensure figures and tables appear at the end of your article with each table or figure on a separate page.

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   b. Author names and affiliations (will not be forwarded for peer review)
   c. Up to 6 key words
   d. Abstract (maximum 150 words)
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   f. Reference list (maximum 30)
   g. Tables (if relevant)
   h. Figures (if relevant)
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