Curtin University

@suze_freogirl

From research to the clinic:
Understanding and using intervention evidence

Suze Leitão, Associate Professor of Speech Pathology

Director of Graduate Research

Curtin School of Allied Health, Western Australia

S.Leitao@Curtin.edu.au

Presented online at the 1st International Developmental Language Disorder Research Conference (IDLDRC2021) 20-22 September 2021 – The DLD Project

Acknowledgement of Country

I would like to acknowledge the Whadjuk Noongar people on whose lands Fremantle is situated, and from where I am recording this Keynote, and recognise their strength, resilience and capacity.

Curtin University

Whitworth, A., Haining, S., & Stringer, H. (2012). Enhancing research capacity across healthcare and higher education sectors: development and evaluation of an integrated model. *BMC Health Services Research*, *12*(1), 1-10.

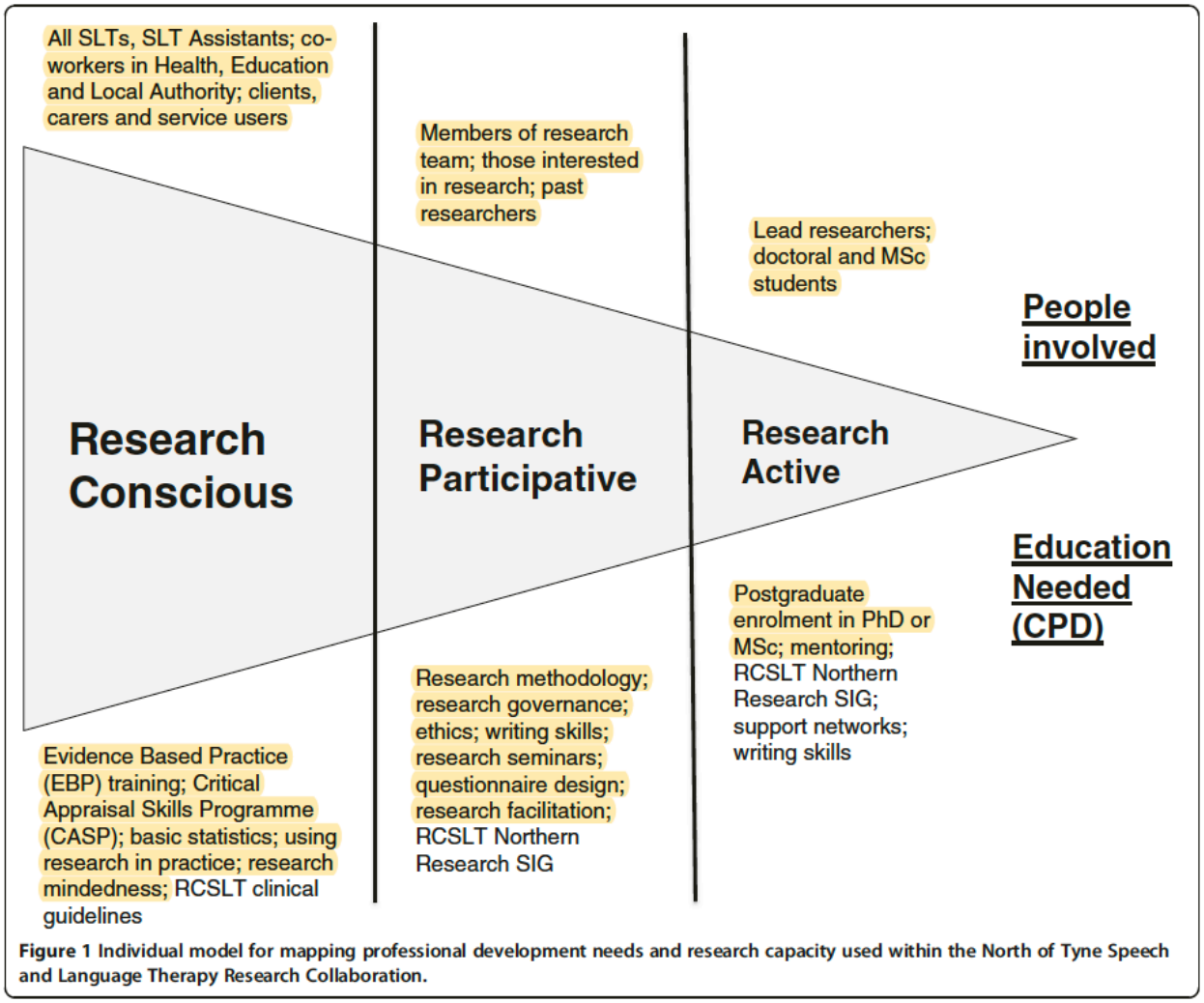
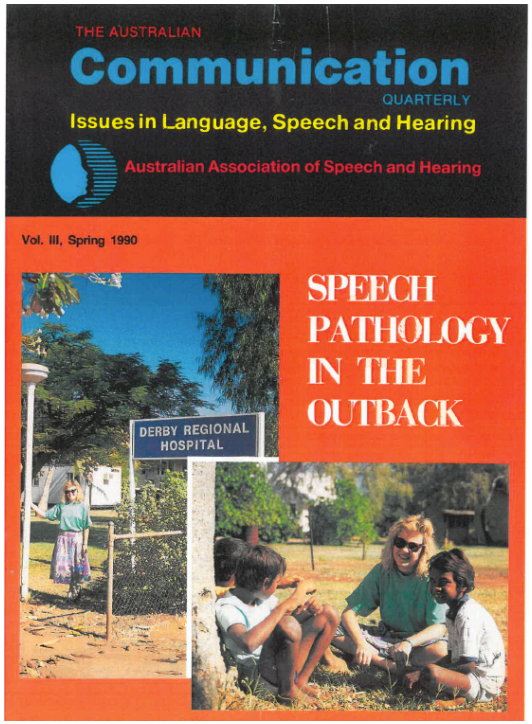


Figure 1 Individual model for mapping professional development needs and research capacity used within the North of Tyne Speech and Language Therapy Research Collaboration.



ARTICLE

CARAWATHA LANGUAGE DEVELOPMENT CENTRE: A MODEL OF SERVICE DELIVEF

by Suze Leitão, Speech Pathologist

Carawatha Language Development Centre (LDC) is a gaz special school providing specialised language intervention c intensive basis. The LDC services an identified populatic children with normal nonverbal cognitive functioning w academic and social performance is limited by seri inadequate/disordered language development. In total, ther 70 students enrolled at the LDC — 10 pre-primary (who at half-time) and 60 primary children, ranging in age from 4 t years. There are a maximum of 10 children per class. Minir attendance is usually 18 months to 2 years and maximum to 5 years. Speech pathology provision for the LDC consi one half-time speech pathologist (SP).

A half-time SP for a caseload of approximately 70 childr a specialist centre means that many service needs are only par met due to time constraints. Such a situation leads to pers stress for the SP involved, along with a feeling of constantly doing the job properly" which is also perceived by other i staff and parents. In order to address these issues a numb steps were taken.

Firstly, a detailed job analysis was put together, in ord analyse the specific job requirements of the particular SP pos at the LDC. This involved looking at the following areas:

— planning of annual workload (including referral/exit proced
— undertaking of caseload
— implementation of therapy
— attendance at meetings
— reactions to requests for information/feedback
— provision of statistics/administrative demands
— professional development (personal)
— professional development (of others)
— student supervision

This analysis provided an overview of the demands being n on the SPs' time and, therefore, a focus for future plannin

The Carawatha L.A.T. — Assessment of the School Age Language Disordered Child

by Leanne Auen and Suzi Leitão

Servicing the school age language disordered population presents many challenges. The research literature of the 1980s has alerted speech pathologists to the relationships between oral language and the development of early literacy. However, these theoretical insights have preceded the development of associated assessment tools and intervention methodologies. Whilst it is common for practice to lag behind theory in this way, the extent of the theory/practice gap is of significant clinical concern as we head into the 90's.

In WA, a number of informal metalinguistic and narrative assessments have been devised by clinicians in an attempt to address this problem. Some of this work has been carried out at the Language Development Centres (LDCs). These are education support schools which provide specialised language intervention as part of a whole education program. Integrating speech pathology and educational objectives in this setting foregrounds the need for appropriate assessment tools. The Carawatha Language Assessment Tool (LAT) represents an attempt to formalise and extend existing assessment procedures for the school age population. The aim of this article is to share the work to date on this project.

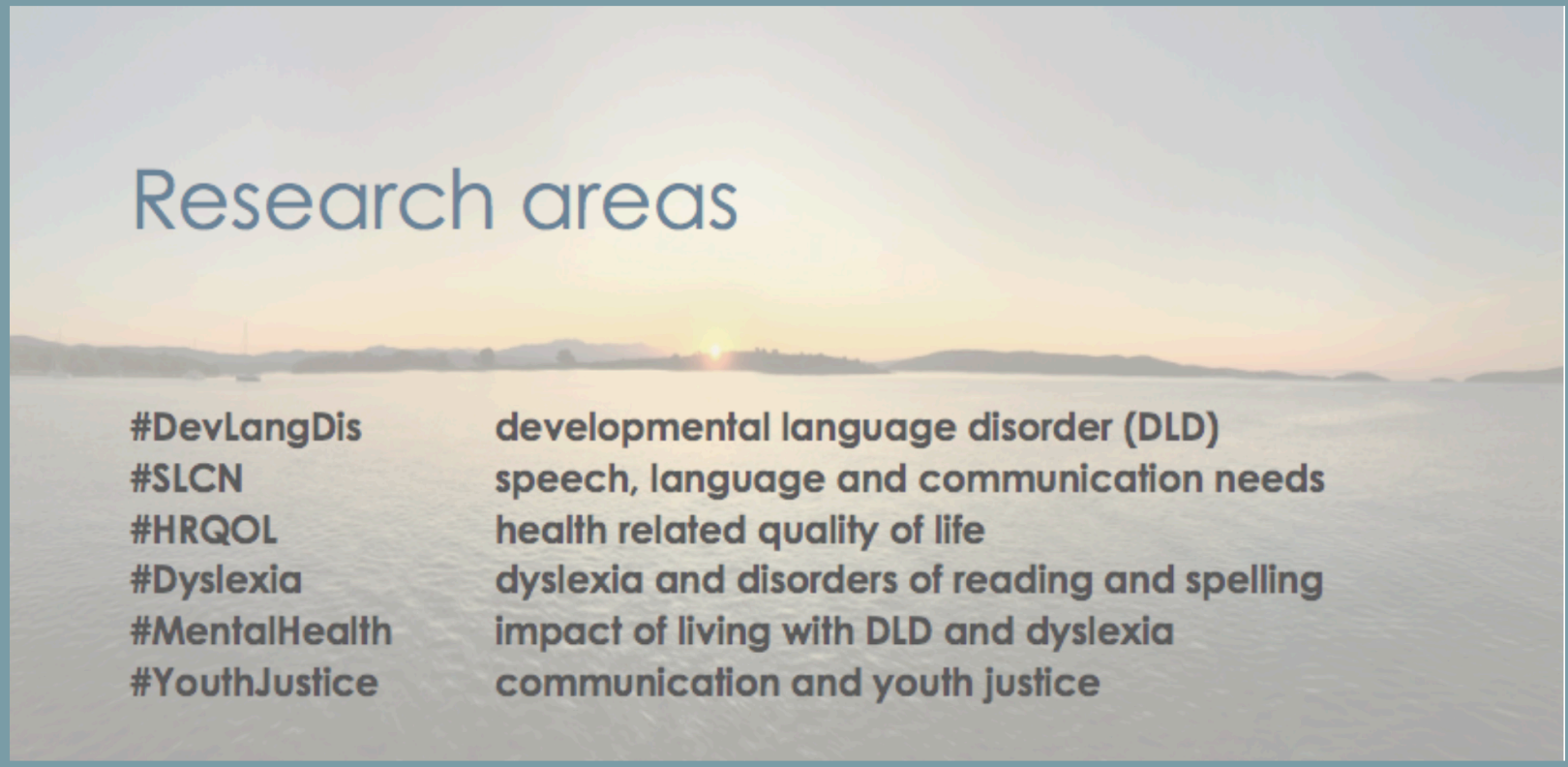
The Carawatha Language Assessment Tool

Specific Objectives

To develop a tool that can be used:

1. for monitoring individual progress;
2. for collection of data that is clinically useful in programming language goals for school age language disordered children;
3. to facilitate a collaborative team approach to management;
4. to establish a data base for long term evaluation of clinical outcomes;
5. for general research purposes, e.g. development of profiling systems, comparison of clinical populations.

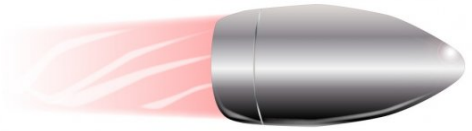
Language and Literacy in Young People



VUJA MITRAUD

It's 10 am in London
TinaMK

Seeking the ‘silver bullet’



I have a client with ‘X’.
What is the best programme to work on ‘X’?

I am looking for the latest treatment for X….

“Evidence-based’ has become in many ways, a meaningless marketing term – used to signal quality

But…….

In many ways there seems to be an inverse relationship between the extent to which a therapy/intervention is described as ‘evidence-based’ and the quality of evidence supporting it use

Evidence is not a binary concept

There are levels of evidence and quality is key

What do we really want to know……..?????	
For Who	Client group
What (and How)	Intervention approach/programme Active ingredients (dose form) Mechanism of change
Works	Level of evidence Feasibility, efficacy, effectiveness, cost effectiveness Outcomes
Best	Define success (Goal setting) Outcome measures (develop) Functional Impact Perspective – client/clinician/other
When and Where	Setting/Context Clinician factors Timing, intensity, dosage, delivery method
And maybe… how much	Cost – to service, to clients and family Money Time ‘Opportunity cost’

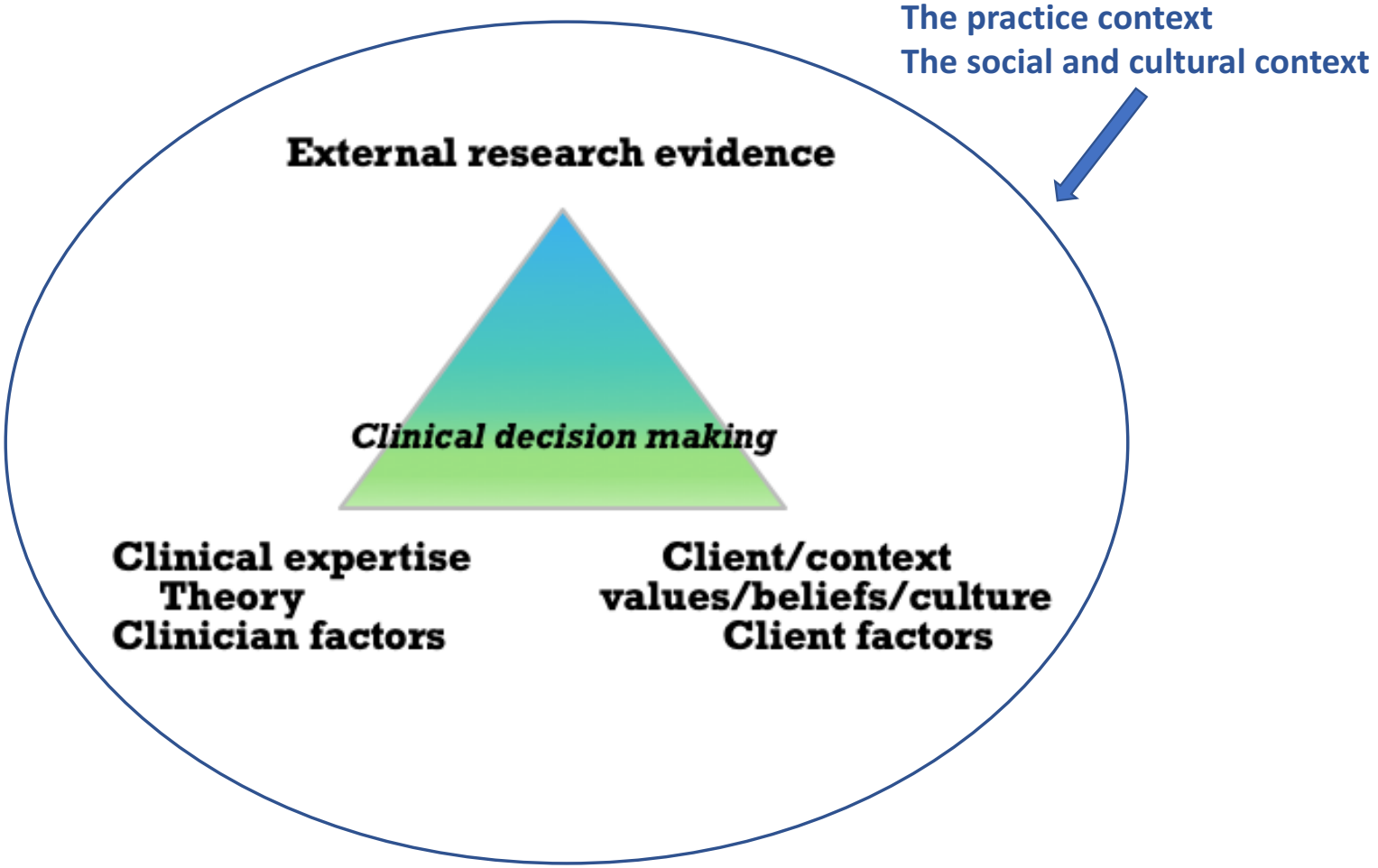
Our ethical and professional responsibility:

- The applicant must have demonstrated knowledge of processes used in research and of the integration of research principles into **evidence-based clinical practice**. *(Standard IV-F; ASHA 2020 Standards and Implementation Procedures for the Certificate of Clinical Competence in Speech-Language Pathology)*

- 1.1. Provide **ethical and evidence-based practice** *(SPA Professional standards)*

- Speech and language therapists take an evidence-based approach to practice, and are a research-active profession *(https://www.rcslt.org/help-and-support/research-overview/#)*

The traditional EBP triangle + context



Understanding the evidence

Reading the research: what do we need to know to understand and use it?

Broad questions to ask of a research paper

- "*Is* this treatment or intervention beneficial?" – to read, understand and evaluate the research that has been done

BUT IF EMPIRICAL SUPPORT IS LACKING

- "*Should* this treatment or intervention work?" – understand the underlying theory, the nature of the language disorder and the proposed mechanism of therapeutic change

(questions based on Clark, 2003)

FROM RESEARCH TO THE CLINIC…….				
Ask the right questions	Find the right articles	Read the articles	Evaluate and understand the articles	Apply the research
		☺		

So……did the researchers…….

WHAT TO ASK	RESOURCES TO HELP
Ask the right question(s)?	I will cover these in subsequent slides based on: Hoffmann, T., Bennett, S., & Del Mar, C. (2017). *Evidence-Based Practice Across the Health Professions-E-pub*. Elsevier Health Sciences.
Choose the correct design to investigate the question?	
Report on the minimum amount of key information?	https://www.equator-network.org/toolkits/peer-reviewing-research/
Do a good enough job? Can we be confident in using the research in our clinic?	https://casp-uk.net/

https://www.equator-network.org/toolkits/peer-reviewing-research/

equator network

Enhancing the QUAlity and Transparency Of health Research

EQUATOR resources in German | Portuguese | Spanish

Home | About us | Library | Toolkits | Courses & events | News | Blog | Librarian Network | Contact

Home > Toolkits > Peer reviewing research

Peer reviewing research

Welcome to our toolkit for peer reviewing health research!

Using the resources you find here will help you decide whether a research manuscript contains enough detail to judge its quality

- Learn about using reporting guidelines to help your peer review
- Peer review training and guides from higher education institutions and publishers
- Peer review in the news and literature

Reporting guidelines in peer review

Reporting guidelines are tools for health researchers to use while writing manuscripts. They provide minimum lists of information needed to ensure a manuscript can be

- Understood by a reader,
- Replicated by a researcher,
- Used by a doctor to make a clinical decision, and
- Included in a systematic review.

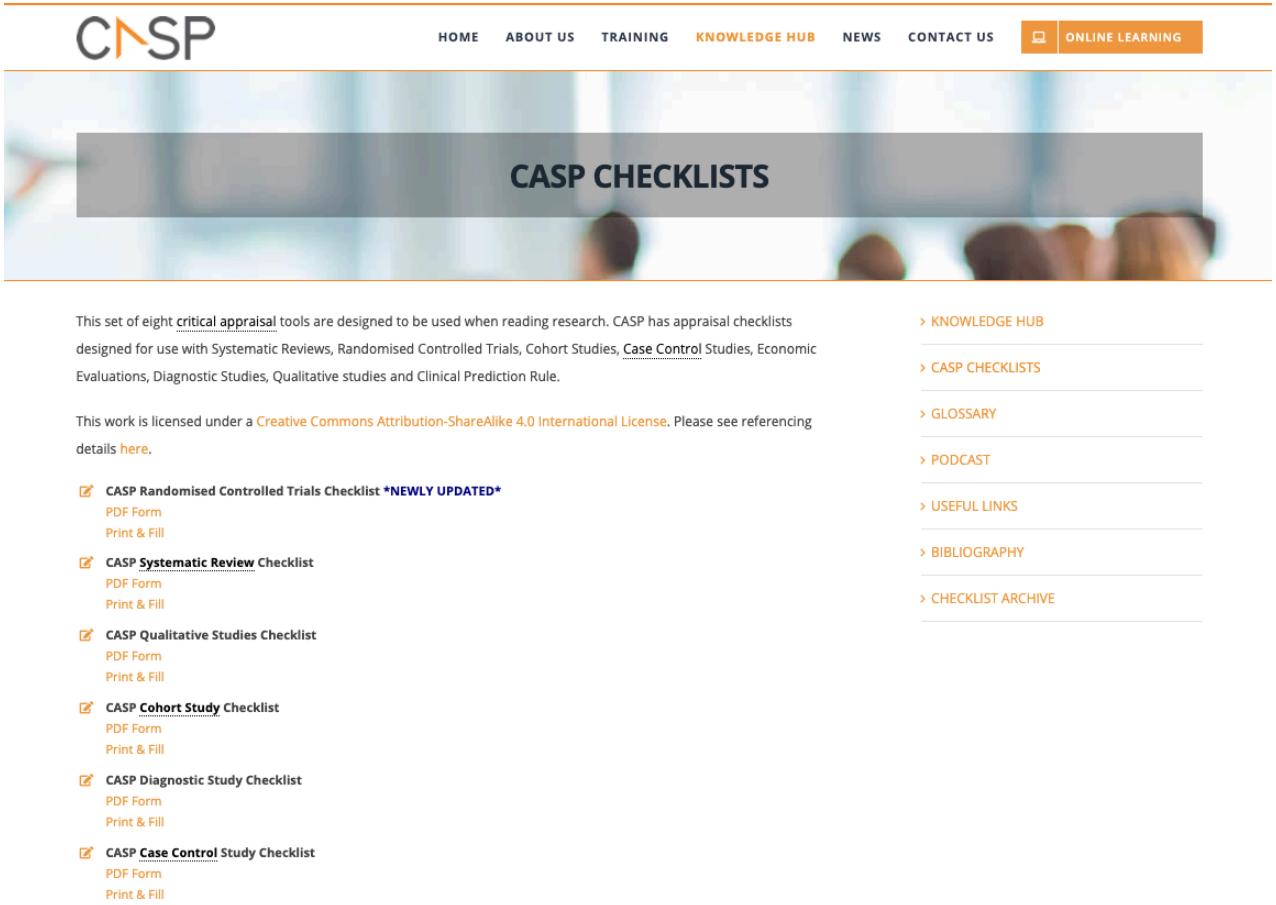
Reporting guidelines are also helpful for reviewers. If the information required by a reporting guideline is not included in a manuscript, then you cannot properly judge the quality of that study. In 2012, we found that around 35% of journals offered freely accessible online instructions about their peer review process and, of those, about half mentioned reporting guidelines.

Reporting guidelines for main study types

Randomised trials	CONSORT	Extensions
Observational studies	STROBE	Extensions
Systematic reviews	PRISMA	Extensions
Study protocols	SPIRIT	PRISMA-P
Diagnostic/prognostic studies	STARD	TRIPOD
Case reports	CARE	Extensions
Clinical practice guidelines	AGREE	RIGHT
Qualitative research	SRQR	COREQ
Animal pre-clinical studies	ARRIVE	
Quality improvement studies	SQUIRE	Extensions
Economic evaluations	CHEERS	

Toolkits

https://casp-uk.net/casp-tools-checklists/



CASP

HOME ABOUT US TRAINING KNOWLEDGE HUB NEWS CONTACT US ONLINE LEARNING

CASP CHECKLISTS

This set of eight critical appraisal tools are designed to be used when reading research. CASP has appraisal checklists designed for use with Systematic Reviews, Randomised Controlled Trials, Cohort Studies, Case Control Studies, Economic Evaluations, Diagnostic Studies, Qualitative studies and Clinical Prediction Rule.

This work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License. Please see referencing details here.

- **CASP Randomised Controlled Trials Checklist *NEWLY UPDATED***
  PDF Form
  Print & Fill
- **CASP Systematic Review Checklist**
  PDF Form
  Print & Fill
- **CASP Qualitative Studies Checklist**
  PDF Form
  Print & Fill
- **CASP Cohort Study Checklist**
  PDF Form
  Print & Fill
- **CASP Diagnostic Study Checklist**
  PDF Form
  Print & Fill
- **CASP Case Control Study Checklist**
  PDF Form
  Print & Fill

› KNOWLEDGE HUB
› CASP CHECKLISTS
› GLOSSARY
› PODCAST
› USEFUL LINKS
› BIBLIOGRAPHY
› CHECKLIST ARCHIVE

Infusing **evidence based practice** into our clinical decision making

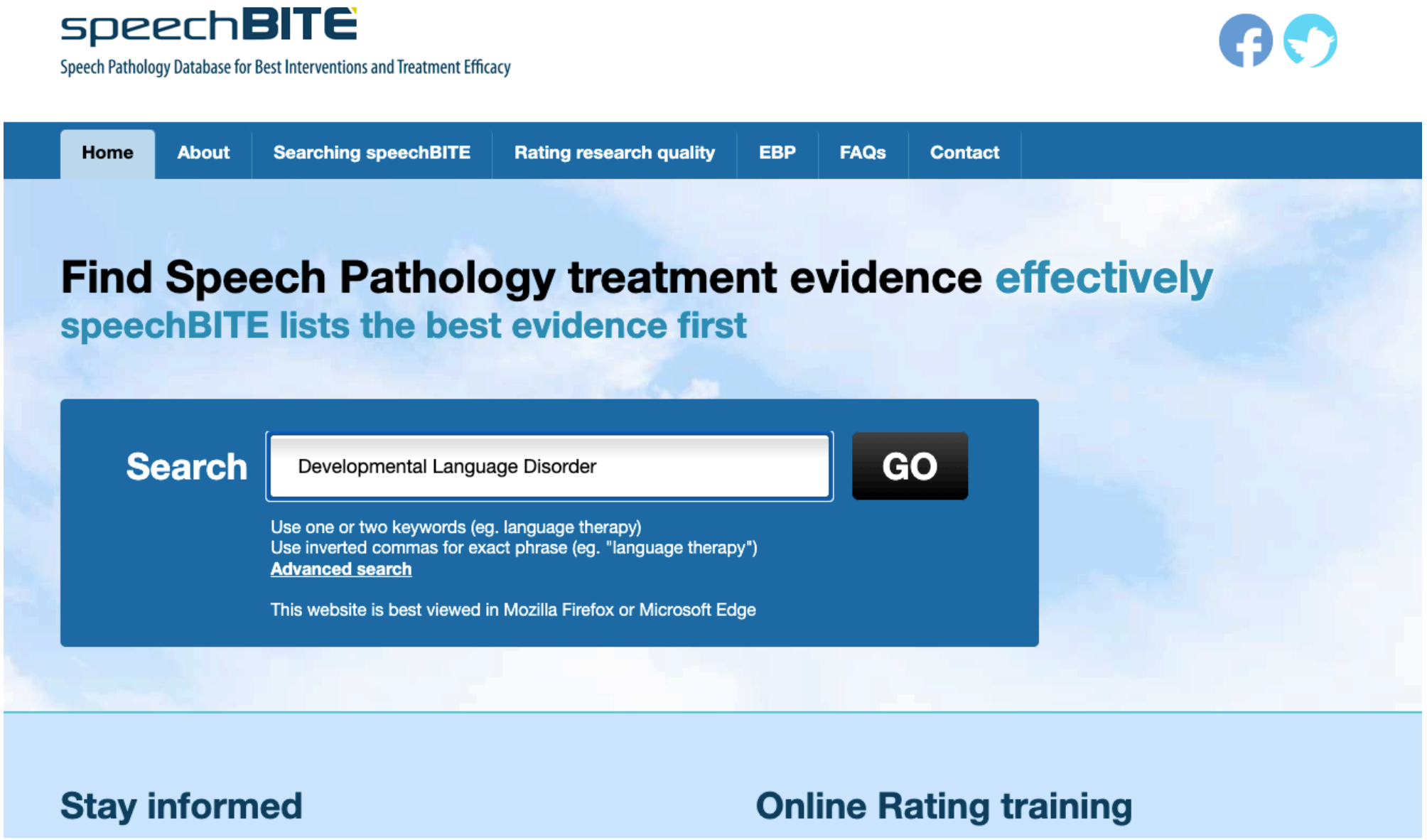
Pixabay

Type	Study Design	on speechBITE
Level 1	Systematic review of randomised controlled trials	All systematic reviews are listed first in search results. Systematic reviews are not rated.
Level 11	Randomised controlled trials	Randomised controlled trials are listed second in the search results. Randomised controlled trials are rated on the PEDro-P scale for methodological quality.
Level 111-1	Pseudo-randomised controlled trials (i.e. using alternate allocation or some other non-random method)	Indexed as non-randomised controlled trials and listed third on speechBITE. Non-randomised controlled trials are rated on the PEDro-P scale for methodological quality.
Level 111-2	A comparative study with concurrent controls: non-randomised experimental trial, cohort study, case-control study or interrupted time series	Indexed as non-randomised controlled trials and listed third on speechBITE. Non-randomised controlled trials are rated on the PEDro-P scale for methodological quality.
Level 111-3	A comparative study without concurrent controls: historical control study, two or more single arm study, interrupted time series without a parallel control group	Indexed as non-randomised controlled trials and listed third on speechBITE. Non-randomised controlled trials are rated on the PEDro-P scale for methodological quality.
Level 4	Case series with either post-test or pre-test/post-test outcomes	Case series with both pre-test/post-test outcomes are listed fourth on speechBITE. Case series are not rated for quality on speechBITE.

NHMRC levels of evidence from http://speechbite.com/faqs/

* There are now more frameworks of levels of evidence specifically for single subject research designs

		Questions to consider
For Who	**Client group**	How close are the participants to my clients (who was left out?)
What (and How)	**Intervention approach/programme** **Active ingredients (dose form)** **Mechanism of change**	How well is the Ix described Do you know what to do? Is there a theoretical underpinning? Can you access the programme?
Works	**Level of evidence** **Feasibility, efficacy, effectiveness, cost effectiveness** **Outcomes**	What is the research design? Does it match the research question? How strong and reliable is the evidence?
Best	**Define success (Goal setting)** **Outcome measures (develop)** **Functional impact** **Perspectives – client/clinician/other**	How was 'success' defined? What (outcome) measures were used? Can I do this with my clients?
When and Where	**Setting/Context** **Clinician factors** **Timing, intensity, dosage, delivery method**	Can I do the Ix in my workplace setting? Do I have the knowledge/skills or do I need to do some training/reading?
And maybe… how much	**Cost – to service, to clients and family** **Money; Time; 'Opportunity cost'**	Overall, is this Ix 'right' for my client and family?


speechBITE
Speech Pathology Database for Best Interventions and Treatment Efficacy
Home
About
Searching speechBITE
Rating research quality
EBP
FAQs
Contact
Find Speech Pathology treatment evidence effectively
speechBITE lists the best evidence first
Search
Developmental Language Disorder
GO
Use one or two keywords (eg. language therapy)
Use inverted commas for exact phrase (eg. "language therapy")
Advanced search
This website is best viewed in Mozilla Firefox or Microsoft Edge
Stay informed
Online Rating training

Advanced search

Keywords: Developmental Language Disorder

Use one or two keywords (eg. language therapy)
Use inverted commas for exact phrase (eg. "language therapy")
Use options below to search journals, author, date etc.

Author

eg. Smith P (no commas)

Source

eg. journal name, organisation name

Year: From Choose To Choose

eg. 2010

Speech Pathology Practice Area: Language impairment - developmental

eg. aphasia

Type of intervention: Language therapy

eg. language therapy

Within this population: Language disorder (developmental)

eg. stroke

Age group: Choose

Type of service delivered: Choose

Research Design: Choose

eg. randomised controlled trial

PEDro-P rating score of at least /10 (for group studies)

Search

112 results found
(August 2021)

Level 1 evidence

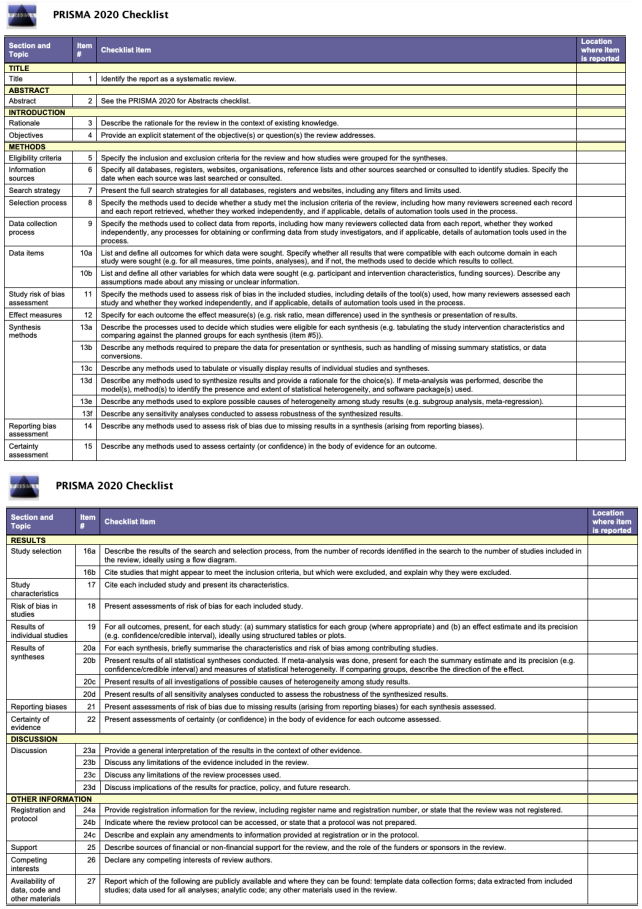
	How it works	The types of questions that this research design is good at answering
Systematic review	The literature is searched using transparent, explicit and pre-defined methods to identify all relevant studies and systematically synthesise the results A SR synthesises findings from many research studies to answer a specific research question Can also include a meta-analysis usually combining/comparing each study's effect size to provide an estimate of clinical effect.	Depends on the topic of the SR but for today's talk: questions about the effectiveness of interventions: e.g. Is this intervention effective? Is one intervention more effective than another?

Source: Hoffman et al. (2017) *Evidence-based practice across the health professions* (3rd ed.), p.26-27

Level 1 evidence – 14 systematic reviews e.g.

Frizelle P, Tolonen AK, Tulip J, Murphy CA, Saldana D, McKean C	The Influence of Quantitative Intervention Dosage on Oral Language Outcomes for Children With Developmental Language Disorder: A Systematic Review and Narrative Synthesis	Language, Speech, and Hearing Services in Schools	2021	Systematic Review
Cable AL, Domsch C	Systematic review of the literature on the treatment of children with late language emergence	International Journal of Language and Communication	2011	Systematic Review
Lowe H, Henry L, Müller L-M, Joffe VL	Vocabulary intervention for adolescents with language disorder: a systematic review	International Journal of Language and Communication Disorders	2018	Systematic Review
Law J, Garrett Z, Nye C	Speech and language therapy interventions for children with primary speech and language delay and disorder	The Cochrane Database of Systematic Reviews	2006	Systematic Review
Law J, Garrett Z, Nye C	The efficacy of treatment for children with developmental speech and language delay/disorder: a meta-analysis	Journal of Speech, Language, and Hearing Research	2004	Systematic Review

If it's a systematic review, it must be good? Not necessarily…… Still need to check



PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	

PRISMA 2020 Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	
Study characteristics	17	Cite each included study and present its characteristics.	
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	
	23b	Discuss any limitations of the evidence included in the review.	
	23c	Discuss any limitations of the review processes used.	
	23d	Discuss implications of the results for practice, policy, and future research.	
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	
Competing interests	26	Declare any competing interests of review authors.	
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	

What to consider?

- The source articles within the SR need to be of good quality

  and

- The SR itself should be carried out clearly and reported accurately

PRISMA checklist from Equator or App at:

https://prisma.shinyapps.io/checklist/

A simpler checklist (based on Richards, 2010, Donohue et al, 2021)

QUESTIONS	YES/NO	NOTES
Does the SR ask a clearly focused and relevant question?		
Does the SR include the right 'types' of study (is the design appropriate for the question'?		
Do the authors explain how they tried to include all the relevant studies?		
Were all the relevant outcomes included?		
What were the findings? Does it apply to my clinical practice/clients?		
Should my clinical practice change as a result of this SR?		

Lowe, H., Henry, L., Müller, L. M., & Joffe, V. L. (2018). Vocabulary intervention for adolescents with language disorder: A systematic review. *International Journal of Language & Communication Disorders*, *53*(2), 199-217.

- 13 studies met inclusion criteria (intervention effectiveness for participants aged 11;0 – 16;11 with language difficulties; aiming to enhance oral vocabulary)

- Strongest evidence for a combined phonological-semantic approach
- Some evidence that this is best if the Ix is embedded in a context such as narrative
- Bespoke outcome measures generally show more change than standardised

Frizelle, P., Tolonen, A. K., Tulip, J., Murphy, C. A., Saldana, D., & McKean, C. (2021). The influence of quantitative intervention dosage on oral language outcomes for children with developmental language disorder: A systematic review and narrative synthesis. *Language, Speech, and Hearing Services in Schools*, *52*(2), 738-754	
For Who	**3-18 yr olds** **Diagnosis of DLD**
What	**Oral language interventions with vocabulary, morphosyntax or phonology outcomes (and experimental manipulation of dosage)**
Works	**13 articles reported on experimental manipulation of dosage out of 244** **3 for vocabulary, 8 for morphosyntax (and none for phonology)**
Best	**Dose frequency was most commonly reported** **Preliminary findings for morphosyntax suggest frequent short sessions or less frequent longer sessions are best** **A need to develop consistent outcome measures for vocabulary (and timing of administration)**
When and Where	**There is a point where more is not necessarily better for vcabulary but currently 36 exposures seems to be optimal dose for 5-6 yr old children with DLD** **Within session dose seems important in morphosyntax**
We need more research – and more detail will come on this work on Day 3 in the session on intervention	

Level 2 evidence

	How it works	The types of questions that this research design is good at answering
Randomised Controlled Trial (RCT)	Experimental study design, where participants are randomly allocated to two (or more) different groups that each receives a different intervention (or the control receives a placebo or waitlist condition). At the end of the trial the effects of the (different) intervention on the outcome(s) are measured	Is this intervention effective? Is one intervention more effective than another?

Source: Hoffman et al. (2017) *Evidence-based practice across the health professions* (3rd ed.), p.26-27

Level 2 evidence: 25 RCTs e.g.

Calder SD, Claessen M, Ebbels S, Leitao S	The Efficacy of an Explicit Intervention Approach to Improve Past Tense Marking for Early School-Age Children with Developmental Language Disorder	Journal of Speech, Language, and Hearing Research	2021	Randomised Controlled Trial
Calder SD, Claessen M, Ebbels S, Leitao S	Explicit Grammar Intervention in Young School-Aged Children with Developmental Language Disorder: An Efficacy Study Using Single-Case Experimental Design	Language, Speech, and Hearing Services in Schools	2020	Single Case Design
Dawes E, Leitão S, Claessen M, Kane R	A randomized controlled trial of an oral inferential comprehension intervention for young children with developmental language disorder	Child Language Teaching and Therapy	2019	Randomised Controlled Trial
Smith-Lock KM, Leitão S, Prior P, Nickels L	The Effectiveness of Two Grammar Treatment Procedures for Children With SLI: A Randomized Clinical Trial	Language, Speech, and Hearing Services in Schools	2015	Randomised Controlled Trial

Level 2: RCT example

- Dawes, E., Leitão, S., Claessen, M., & Kane, R. (2019). A randomized controlled trial of an oral inferential comprehension intervention for young children with developmental language disorder. *Child Language Teaching and Therapy*, *35*(1), 39-54.

Oral Inferential Comprehension

Intervention targets:

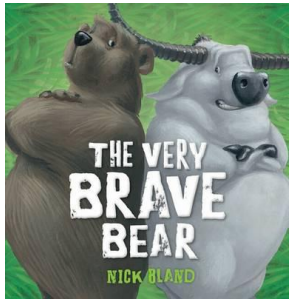
- **Inferential and literal comprehension** of narrative
- **Narrative retell** ability (macrostructure and microstructure).
- **Theory of mind**.

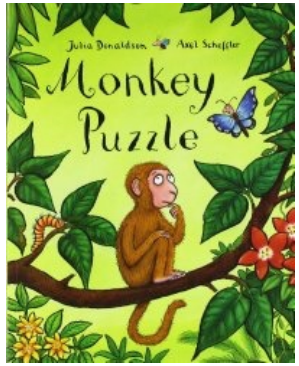
Intervention principles

- **Open-ended inferential questions** during **dialogic book-sharing**.
- **Think alouds** (e.g. I wonder..., I think...).
- **Repeated, interactive reading**.
- **Explicit focus on inferencing**
- **Explicit learning goals**.
- Relate the story to **personal experiences** and make **predictions**.
- Focus on **theory of mind .**
- **Scaffolding.**
- Use **graphic organisers** (story grammar icons & story map).
- **Meta-narrative awareness** – what makes a good story?

Oral Inferential Comprehension Intervention

- Four narratives
- Four sessions per narrative

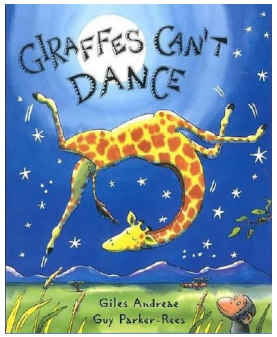




Session 1 and Session 2

- **Book sharing**
- Higher level vocabulary (e.g. Slimy, mighty, splendid)
- **Story map (retelling)**

Oral Inferential Comprehension Intervention

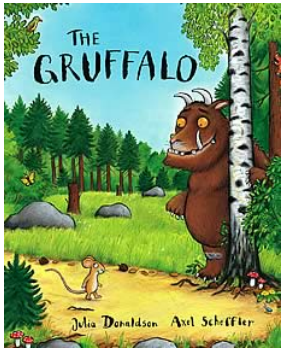


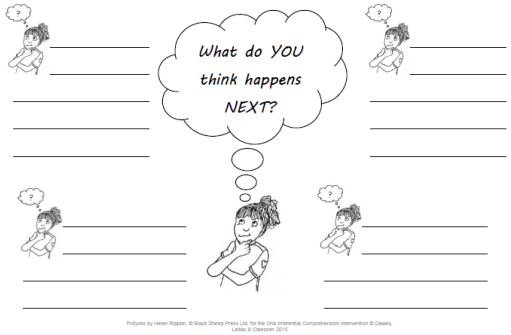
Session 3

- **Book sharing**
- Retelling
- **Character emotions -** link to personal experiences (e.g. worried, frightened, excited)

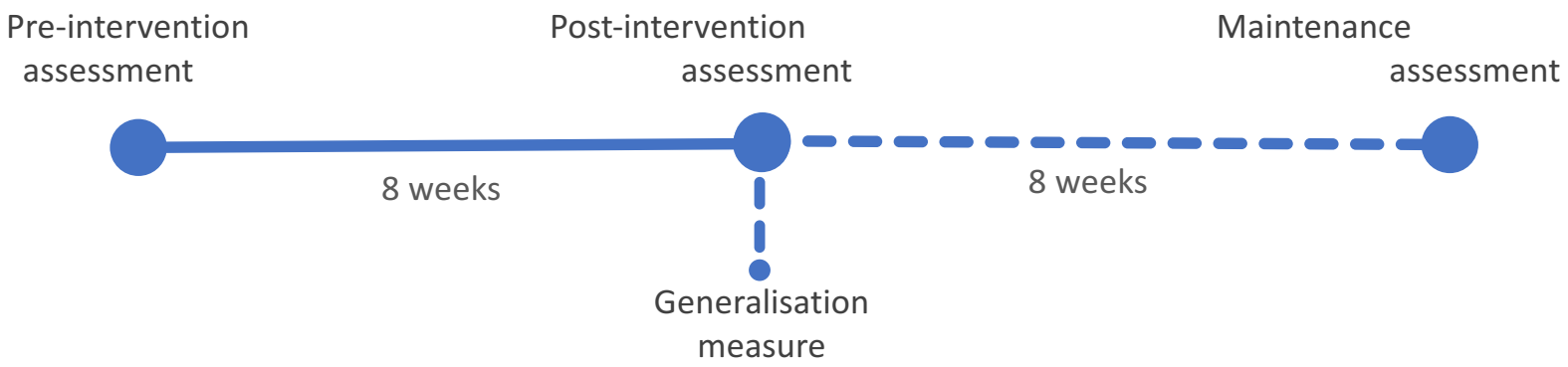
Session 4

- **Book sharing**
- Retelling
- **Prediction**





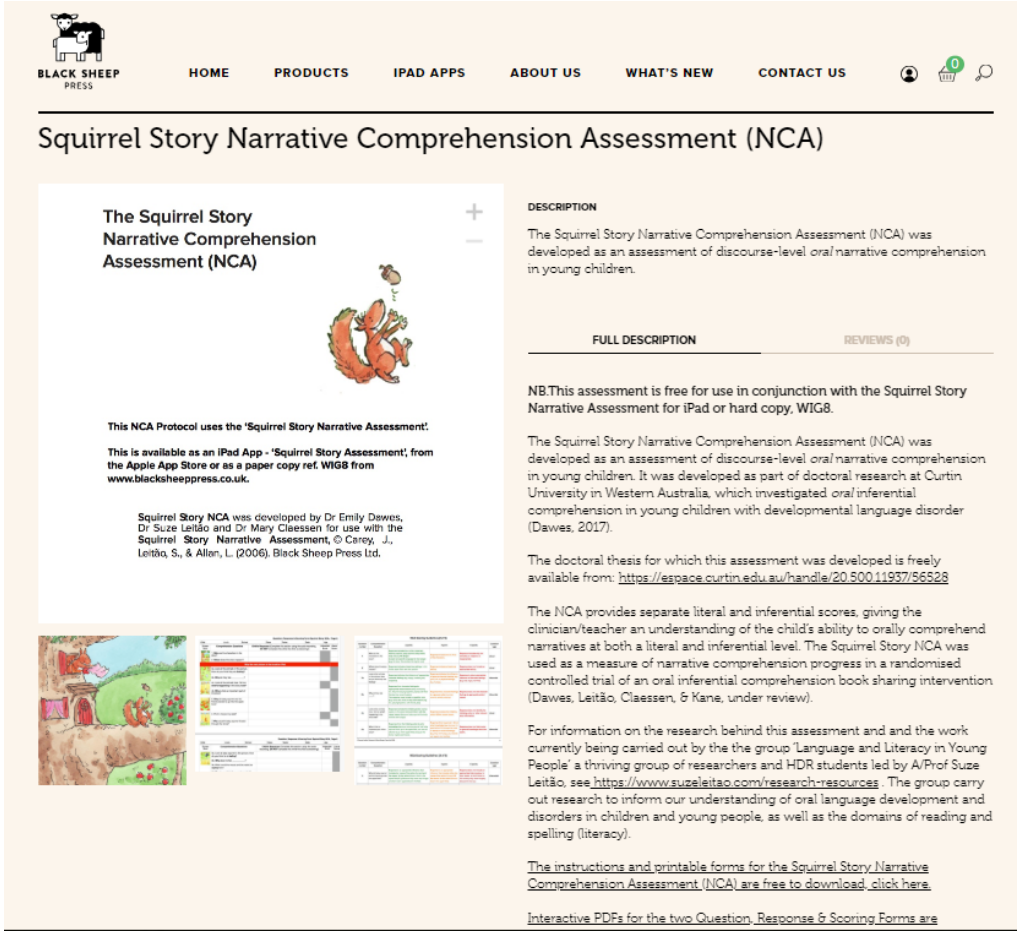
- 37 participants (aged 5 to 6 years) with DLD.
- Random allocation:
  - Inferential comprehension (IC) intervention *(n* = 19*).*
  - Control phonological awareness (PA) intervention *(n* = 18*)* .
- Small groups (3 - 4 children).
- 8 week intervention (two 30-minute sessions per week).



The Squirrel Story NCA

The NCA is freely available via: https://www.blacksheeppress.co.uk/product/squirrel-story-narrative-comprehension-assessment-nca/ Administered using the iPad or hard copy versions of the Squirrel Story Narrative (available from Black Sheep Press Ltd.) or via LaLYP site

Dawes, E. Leitão, S., Claessen, M. (2019) Oral literal and inferential narrative comprehension in young typically developing children and children with developmental language disorder, *International Journal of Speech-Language Pathology*. 21 (3), 275-285.



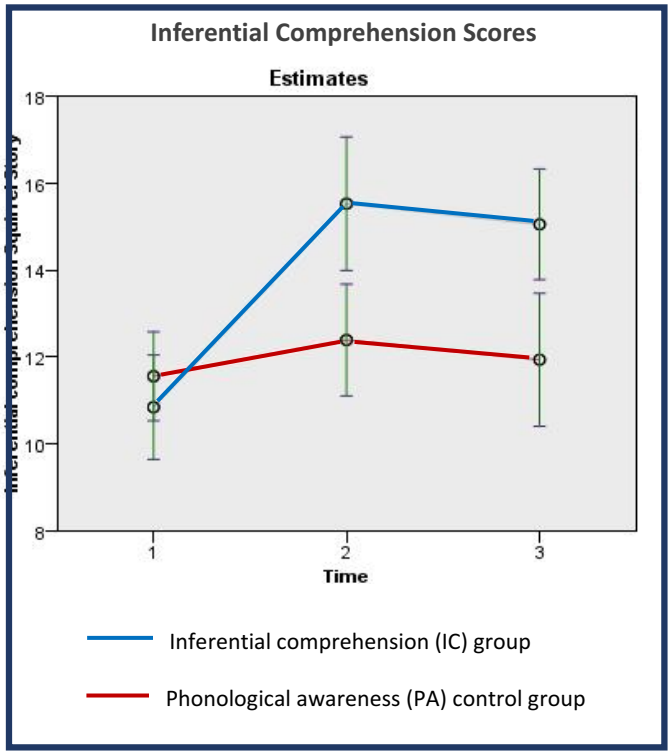
Results

Narrative comprehension assessment (The Squirrel Story)

1. Pre-intervention
2. Post-intervention
3. Maintenance

Inferential comprehension

- Significant time effect for IC group ($p < .001$), but not PA group ($p = .315$).
- **IC group showed significant improvement from pre- to post-intervention** ($p < .001$).



CONSORT 2010 checklist of information to include when reporting a randomised trial*

Section/Topic	Item No	Checklist item	Reported on page No
Title and abstract			
	1a	Identification as a randomised trial in the title	39
	1b	Structured summary of trial design, methods, results, and conclusions (for specific guidance see CONSORT for abstracts)	(39)
Introduction			
Background and objectives	2a	Scientific background and explanation of rationale	40-42
	2b	Specific objectives or hypotheses	42
Methods			
Trial design	3a	Description of trial design (such as parallel, factorial) including allocation ratio	-
	3b	Important changes to methods after trial commencement (such as eligibility criteria), with reasons	-
Participants	4a	Eligibility criteria for participants	43
	4b	Settings and locations where the data were collected	43
Interventions	5	The interventions for each group with sufficient details to allow replication, including how and when they were actually administered	44-46 + on-line
Outcomes	6a	Completely defined pre-specified primary and secondary outcome measures, including how and when they were assessed	43-44
	6b	Any changes to trial outcomes after the trial commenced, with reasons	-
Sample size	7a	How sample size was determined	47
	7b	When applicable, explanation of any interim analyses and stopping guidelines	-
Randomisation:			
Sequence generation	8a	Method used to generate the random allocation sequence	
	8b	Type of randomisation; details of any restriction (such as blocking and block size)	(44)
Allocation concealment mechanism	9	Mechanism used to implement the random allocation sequence (such as sequentially numbered containers), describing any steps taken to conceal the sequence until interventions were assigned	-
Implementation	10	Who generated the random allocation sequence, who enrolled participants, and who assigned participants to interventions	-

Blinding	11a	If done, who was blinded after assignment to interventions (for example, participants, care providers, those assessing outcomes) and how	44
	11b	If relevant, description of the similarity of interventions	-
Statistical methods	12a	Statistical methods used to compare groups for primary and secondary outcomes	47-49
	12b	Methods for additional analyses, such as subgroup analyses and adjusted analyses	
Results			
Participant flow (a diagram is strongly recommended)	13a	For each group, the numbers of participants who were randomly assigned, received intended treatment, and were analysed for the primary outcome	44
	13b	For each group, losses and exclusions after randomisation, together with reasons	-
Recruitment	14a	Dates defining the periods of recruitment and follow-up	43
	14b	Why the trial ended or was stopped	-
Baseline data	15	A table showing baseline demographic and clinical characteristics for each group	-
Numbers analysed	16	For each group, number of participants (denominator) included in each analysis and whether the analysis was by original assigned groups	47-49
Outcomes and estimation	17a	For each primary and secondary outcome, results for each group, and the estimated effect size and its precision (such as 95% confidence interval)	47-49
	17b	For binary outcomes, presentation of both absolute and relative effect sizes is recommended	-
Ancillary analyses	18	Results of any other analyses performed, including subgroup analyses and adjusted analyses, distinguishing pre-specified from exploratory	-
Harms	19	All important harms or unintended effects in each group (for specific guidance see CONSORT for harms)	-
Discussion			
Limitations	20	Trial limitations, addressing sources of potential bias, imprecision, and, if relevant, multiplicity of analyses	50
Generalisability	21	Generalisability (external validity, applicability) of the trial findings	50-51
Interpretation	22	Interpretation consistent with results, balancing benefits and harms, and considering other relevant evidence	49-51
Other information			
Registration	23	Registration number and name of trial registry	-
Protocol	24	Where the full trial protocol can be accessed, if available	-
Funding	25	Sources of funding and other support (such as supply of drugs), role of funders	51

*We strongly recommend reading this statement in conjunction with the CONSORT 2010 Explanation and Elaboration for important clarifications on all the items. If relevant, we also recommend reading CONSORT extensions for cluster randomised trials, non-inferiority and equivalence trials, non-pharmacological treatments, herbal interventions, and pragmatic trials. Additional extensions are forthcoming: for those and for up to date references relevant to this checklist, see www.consort-statement.org.

Critical Appraisal checklist for an RCT (Dawes et al, 2019)	
Did the study address a clearly focused research question?	YES
Was the assignment of participants to interventions randomised?	YES
Were all participants who entered the study accounted for at its conclusion?	YES
Were the participants 'blind' to intervention they were given? • Were the investigators 'blind' to the intervention they were giving to participants? • Were the people assessing/analysing outcome/s 'blinded'?	? NO YES
Were the study groups similar at the start of the randomised controlled trial?	YES
Apart from the experimental intervention, did each study group receive the same level of care (that is, were they treated equally)?	YES
Were the effects of intervention reported comprehensively?	YES
Was the precision of the estimate of the intervention or treatment effect reported?	NO
Do the benefits of the experimental intervention outweigh the harms and costs?	How does this Ix apply to your client(s)?
Can the results be applied to your local population/in your context?	
Would the experimental intervention provide greater value to the people in your care than any of the existing interventions?	

Dawes, E., Leitão, S., Claessen, M., & Kane, R. (2019). A randomized controlled trial of an oral inferential comprehension intervention for young children with developmental language disorder. *Child Language Teaching and Therapy*, *35*(1), 39-54.	
For Who	**5-6 yr olds** **Diagnosis of DLD**
What	**Inferential comprehension Ix – content/design based on a lit review + profiling study** **Principles are described (Table 2 + examples Table 3)** **Outline of sessions (Table 4)** Full programme can be downloaded freely from: https://www.languageandliteracyinyoungpeople.com/apps-resources
Works	**RCT – compared to control group significant increase for treatment group in inferencing pre-post, maintained over time and generalised**
Best	**Bespoke Narrative Comprehension Assessments (literal and inferential comprehension)**
When and Where	**Small group in a school context led by a speech pathologist**

Inferential Comprehension Intervention (Dawes, Leitão & Claessen, 2nd Ed 2019)

If YES?

@EmilyDawesSLP

Freely available to download and use

https://www.languageandliteracyinyoungpeople.com/apps-resources

FREE: ORAL INFERENTIAL COMPREHENSION INTERVENTION

This is a freely available 16 session small group intervention programme targeting oral inferential comprehension of narratives. It was evaluated in a randomised controlled trial with young children with developmental language disorder, reported in https://espace.curtin.edu.au/handle/20.500.11937/56528 and soon to be published in a peer reviewed journal.

ACCESS THE ORAL INFERENTIAL INTERVENTION PROGRAMME HERE

Level 3 evidence

	How it works	The types of questions that this research design is good at answering
Non-randomised controlled design	Experimental study that is the same as an RCT but there is no randomisation of participants to the intervention/control groups. Allocation to groups is usually based on convenience groupings, and this can introduce sampling bias.	**Questions about:** Effectiveness of interventions (but because of the potential sampling bias we cannot be as sure that there were not differences between the groups that influenced the outcomes.)

Source: Hoffman et al. (2017) *Evidence-based practice across the health professions* (3rd ed.),

Level 3 evidence: 14 Non Randomised Controlled trials e.g.

Authors	Title	Source	Year	Research Design	Rating Score	
Smith-Lock K, Leitao S, Lambert L, Nickels L	Effective intervention for expressive grammar in children with specific language impairment	International Journal of Language and Communication Disorders	2013	Non Randomised Controlled Trial		
Smith-Lock K, Leitão S, Lambert L, Prior P, Dunn A, Cronje J, Newhouse S, Nickels L	Daily or weekly? The role of treatment frequency in the effectiveness of grammar treatment for children with specific language impairment	International Journal of Speech-Language Pathology	2013	Non Randomised Controlled Trial		

Level 3: Non RCT example

- Smith-Lock, K. M., Leitao, S., Lambert, L., & Nickels, L. (2013). Effective intervention for expressive grammar in children with specific language impairment. *International Journal of Language & Communication Disorders*, *48*(3), 265-282.

Smith-Lock, K. M., Leitao, S., Lambert, L., & Nickels, L. (2013). Effective intervention for expressive grammar in children with specific language impairment. *International Journal of Language & Communication Disorders*, *48*(3), 265-282.	
For Who	**5 yr olds** **Diagnosis of DLD**
What	**Explicit teaching of grammar targets in a large group followed by use of implicit techniques in smaller groups (modeling, focused stimulation, recasting, elicited imitation)**
Works	**Quasi experimental (2 groups not randomised)** **Compared to the control group, a significant increase for treatment group pre-post (2 pre Tx assessments showed stability, post Ax showed sig increase)**
Best	**Individually selected targets; bespoke measure the GET (grammar elicitation test)** **Significant improvement in grammar (large effect size) for children in Grammar Ix and not Control Ix (who improved in the control goals)** **(individual analysis showed tx effect significant for most)**
When and Where	**Small group in a school context led by a speech pathologist or teacher or teaching assistant** **Ix - 1 hour per week for 8 weeks**

And:

Weekly Ix over 8 weeks *more effective* than daily over 8 days

Smith-Lock, K., Leitão, S., Lambert, L., Prior, P., Dunn, A., Cronje, J., ... & Nickels, L. (2013). Daily or weekly? The role of treatment frequency in the effectiveness of grammar treatment for children with specific language impairment. *International Journal of Speech-Language Pathology*, *15*(3), 255-267.

Treatment techniques that use modelling + recasting and involve child production *more effective* than those using modelling + recasting without child production

Smith-Lock, K. M., Leitão, S., Prior, P., & Nickels, L. (2015). The effectiveness of two grammar treatment procedures for children with SLI: A randomized clinical trial. *Language, Speech, and Hearing Services in Schools*, *46*(4), 312-324.

Level 3-4 evidence

	How it works	The types of questions that this research design is good at answering
Single case experimental design	Experimental study design where an individual's response to intervention is measured over time. Experimental as the design incorporates 'control' Measurements of the outcome(s) of interest are taken before, during and after the intervention; and usually after some follow-up period	Questions about effectiveness of interventions: Is this intervention effective? Is one intervention more effective than another? (for an individual)
Case series	A descriptive report on a series of clients (i.e. cases), who have an outcome or health condition of interest, or who received the intervention being studied. Descriptive as the design does not include control.	Emerging phenomena, health conditions or new forms of intervention (pilot studies or feasibility studies)

A bird's eye view of speechBITE

JCPSLP 2013, 15(3) Munro et al

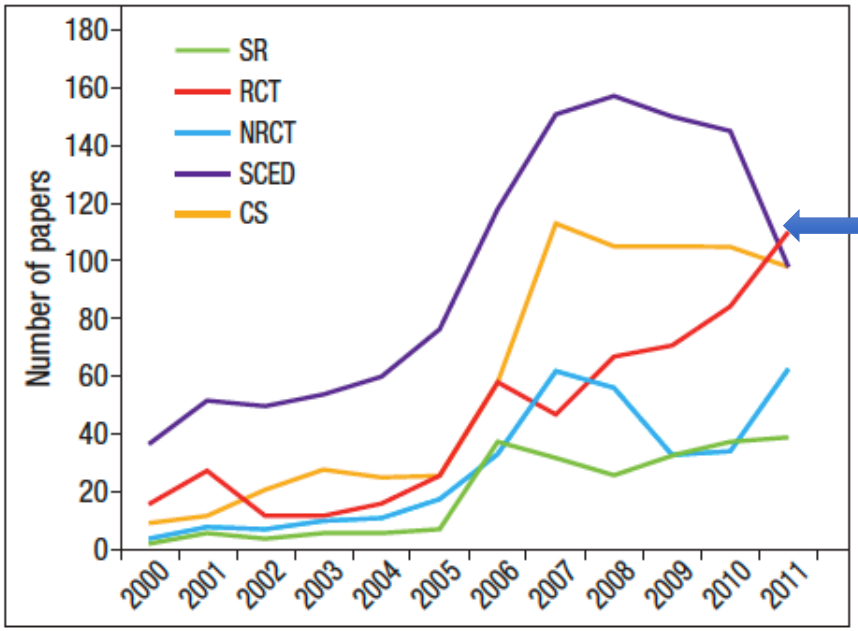


Figure 1. Number of papers listed in speechBITE™ according to year of publication from 2000–2011 and research design

Note: SR = systematic review, RCT = randomised controlled trial, NRCT = non-randomised controlled trial, SCED = single-case experimental design and CS = case series.

In 2013
CASE SERIES (DESCRIPTIVE) and SCEDS (EXPERIMENTAL) = most frequent research designs

***August 2021:**
1240 studies classified as case series
2182 studies classified as single case designs

Logan, L. R., Hickman, R. R., Harris, S. R., & Heriza, C. B. (2008). Single-subject research design: recommendations for levels of evidence and quality rating. *Developmental medicine & child neurology*, *50*(2), 99-103.
Tate, R. L., Perdices, M., Rosenkoetter, U., Shadish, W., Vohra, S., Barlow, D. H., ... & Wilson, B. (2016). The single-case reporting guideline in behavioural interventions (SCRIBE) 2016 statement. *Physical Therapy*, *96*(7), e1-e10.

Table I: Levels of evidence for single-subject research designs (SSRDs)

Level	*Evidence*
I	Randomized controlled *N*-of-1 (RCT), alternating treatment (ATD), and concurrent or non-concurrent multiple baseline designs (MBDs)[a] with clear-cut results; generalizability if the ATD is replicated across three or more subjects and the MBD design consists of a minimum of three subjects, behaviors, or settings. These designs can provide causal inferences.
II	Non-randomized, controlled, concurrent MBD[a] with clear-cut results; generalizability if design consists of a minimum of three subjects, behaviors, or settings; limited causal inferences.
III	Non-randomized, non-concurrent, controlled MBD[a] with clear-cut results; generalizability if design consists of a minimum of three subjects, behaviors, or settings; limited causal inferences.
IV	Non-randomized, controlled SSRDs with at least three phases (ABA, ABAB, BAB, etc.) with clear-cut results; generalizability if replicated across five or more different subjects; only hints at causal inferences.
V	Non-randomized controlled AB single-subject research design with clear-cut results; generalizability if replicated across three or more different subjects; suggests causal inferences allowing for testing of ideas.

[a]If the intervention(s) is known to be successful, a baseline or control phase is not required.

Oxford levels of evidence have SCEDs at LEVEL 3b with control, and case series at LEVEL 4
https://www.cebm.ox.ac.uk/resources/levels-of-evidence/oxford-centre-for-evidence-based-medicine-levels-of-evidence-march-2009

Level 3 evidence: 37 SCEDS

Calder SD, Claessen M, Ebbels S, Leitao S	Explicit Grammar Intervention in Young School-Aged Children with Developmental Language Disorder: An Efficacy Study Using Single-Case Experimental Design	Language, Speech, and Hearing Services in Schools	2020	Single Case Design

Calder SD, Claessen M, Leitão S	Combining implicit and explicit intervention approaches to target grammar in young children with Developmental Language Disorder	Child Language Teaching and Therapy	2018	Single Case Design

Level 4 Evidence

- Calder, S. D., Claessen, M., Ebbels, S., & Leitão, S. (2020). Explicit grammar intervention in young school-aged children with developmental language disorder: An efficacy study using single-case experimental design. *Language, speech, and hearing services in schools*, *51*(2), 298-316.

Calder, S. D., Claessen, M., Ebbels, S., & Leitão, S. (2020). Explicit grammar intervention in young school-aged children with developmental language disorder: An efficacy study using single-case experimental design. *Language, speech, and hearing services in schools*, *51*(2), 298-316	
For Who	**5-6 yr olds** **DLD** **Grammatical difficulties**
What	**Theoretically Motivated Past Tense Intervention (TheMEDI)** **Dose form is explicit intervention combining metalinguistic training using the SHAPE CODING system** **All session plans can be downloaded freely from: https://www.languageandliteracyinyoungpeople.com/apps-resources**
Works	**ABA across-participant multiple-baseline SCED, including a minimum of five data points (i.e., sessions) for each phase** **Target and generalisation (past tense), extension (third person singular) and control targets (possessive 's)** **Replicated and built on earlier pilot studies**
Best	**Structured Photographic Expressive Language test 3rd Ed (standardised)** **Bespoke measures of expressive morphosyntax (GET) and grammaticality judgment (GJT) of trained and untrained targets + extension and control**
When and Where	**Individually twice a week for 20-to 30-min sessions for 10 weeks with a speech pathologist**

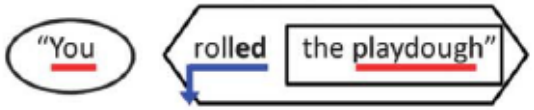
(Calder, Claessen, Ebbels & Leitao 2020)

If YES?

@samueldcalder

Session Plans/Programme freely available to download and use

https://www.languageandliteracyinyoungpeople.com/apps-resources



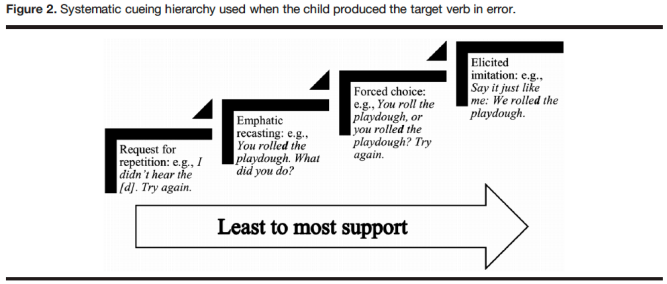


Figure 2. Systematic cueing hierarchy used when the child produced the target verb in error.

Level 3/4 evidence: 21 case series

Glisson L, Leitão S, Claessen M	Evaluating the efficacy of a small-group oral narrative intervention programme for pre-primary children with narrative difficulties in a mainstream school setting	Australian Journal of Learning Difficulties	2019	Case Series

*(This study does use control so is more like a SCED)

Level 3/4 example:

- Glisson, L., Leitão, S., & Claessen, M. (2019). Evaluating the efficacy of a small-group oral narrative intervention programme for pre-primary children with narrative difficulties in a mainstream school setting. *Australian Journal of Learning Difficulties*, *24*(1), 1-20.

The ONIP – Macrostructure approach

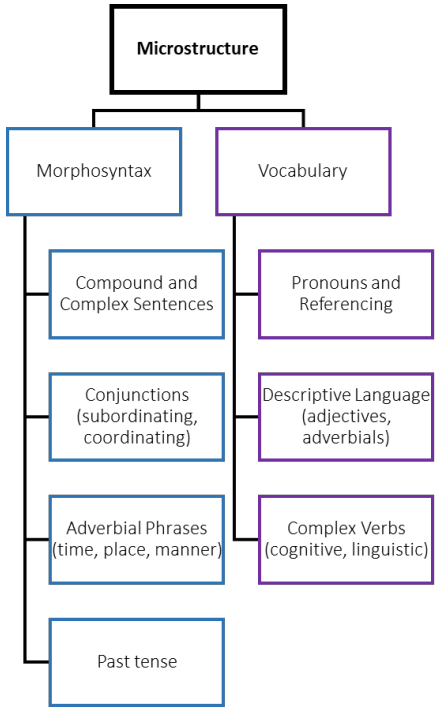
Directly treat macrostructure (story grammar):

- **Metalinguistic and explicit instruction:**
  - Explicit teaching scripts, icons and gestures for macrostructure elements, and
  - graphic organisers (story boards) for text comprehension and production.
- **Repeated book shares:**
  - Activating prior knowledge of the theme or plot,
  - Identifying narrative macrostructure elements, and
  - Answering discourse comprehension questions.
- Repeated **models** and **demonstrations.**
- **Multiple opportunities** to retell and generate stories.

The ONIP – Microstructure approach

Implicit facilitation of microstructure features in the context of narrative:

- **Multiple opportunities** to engage in listening, retelling and generating stories.
- **Modelling** using modified scripts:
  - Consistent sentence frames for macrostructure inclusion e.g.:
    - ”Suddenly,…”
    - “He felt…”
    - “So, he decided to…”
- Scripted **language facilitation** techniques:
  - recasting, rephrasing,
  - expanding/extending, adding language, and
  - vertical structuring.



The ONIP:

- **Small group** intervention (3-4 students per group)
- **6-week** programme, to easily fit into a school term
- Delivered in **30-40 minute sessions, 3 times a week**
- Uses **well-known children's books** as the therapy context
- Uses a gradual release of responsibility model (I Do, We Do, You Do)
- **18 sessions** in total
- Two phases of the programme:
  - **Phase 1** – 9 sessions (3 weeks) to ***teach*** narrative macrostructure knowledge
  - **Phase 2** – 9 sessions (3 weeks) to ***apply*** narrative macrostructure knowledge to 3 different stories and practise narrative retelling

Bespoke causal ‘kick-off’ pictures

“Look at the picture and think of a story to tell me. Oh, something’s happening. Can you tell me a story about what’s happening in the picture?”

Verbal prompts: *“Yeah?”; “Mhmm”; “Anything else?” / “Is that it?”*

Non-verbal prompts: *Nodding; Smiling and waiting expectantly*

Did macrostructure change on the TNL?

P	NLAI		Clinical Category	
	Pre	Post	Pre	Post
1	85	106	Below Ave	Ave*
2	46	61	Very Poor	Very Poor
3	73	103	Poor	Ave**
4	82	94	Below Ave	Ave*
5	85	91	Below Ave	Ave*
6	91	97	Ave	Ave
7	73	91	Poor	Ave**
8	55	73	Very Poor	Poor *
9	70	85	Poor	Below Ave*
10	70	106	Poor	Ave**
11	88	106	Below Ave	Ave*

Did macro- and micro- structure change on our bespoke measure?

Repeated Measure	Significant Change (Out of 11)	Medium - Large Effect Size (Out of 11)	Hypothesis Supported?
Total Macrostructure Score	7	8	✓
Conjunctions	8	8	✓
Adverbials	6	7	✓
Adjectives	3	4	✗
Complex C-units	0	0	✗

Effect size (Cohen's *d*)
.2-.5 = small effect
.5- .8 = medium effect
>.8 = large effect

Glisson, L., Leitão, S., & Claessen, M. (2019). Evaluating the efficacy of a small-group oral narrative intervention programme for pre-primary children with narrative difficulties in a mainstream school setting. *Australian Journal of Learning Difficulties*, *24*(1), 1-20.	
For Who	**5-6 yr olds** **Weak narrative skills**
What	**Oral Narrative Intervention Programme (ONIP) – content/design based on a lit review + profiling study** **Explicit teaching of macrostructure, applying knowledge of macrostructure, modelling of microstructure** Full programme can be downloaded freely from: https://www.languageandliteracyinyoungpeople.com/apps-resources
Works	**Multiple baseline single-subject research design, replicated across 11 participants with a staggered baseline** **Statistical and clinical significance measured** **Changes in macrostructure and some microstructure**
Best	**Test of Narrative Language (standardised)** **Bespoke single picture narrative generation task (Black Sheep Press)**
When and Where	**Small group in a mainstream school context led by a speech pathologist**

Oral Narrative Intervention Programme (Glisson, Leitao & Claessen 2019)

If YES?

@LauraGlisson

Freely available to download and use

https://www.languageandliteracyinyoungpeople.com/apps-resources

FREE: ORAL NARRATIVE INTERVENTION PROGRAMME (ONIP)

This is a freely available oral narrative programme delivered in a book sharing context. The manual contains the background, links to the literature and theory, and 18 session plans. It was designed, developed and evaluated by Laura Glisson in her MPhil research. Links to her thesis and published paper are on our RESEARCH AND RESOURCES page on this website.

ACCESS THE ORAL NARRATIVE INTERVENTION PROGRAMME HERE

Understanding the evidence is **more** than just reading and using the quantitative research

Qualitative studies: client and family perspectives

- de López, K. M. J., Feilberg, J., Baena, S., Lyons, R., Harding, S., Kelić, M., ... & Rodriguez-Ortiz, I. R. (2021). “So, I told him to look for friends!” Barriers and protecting factors that may facilitate inclusion for children with Language Disorder in everyday social settings: Cross-cultural qualitative interviews with parents. *Research in Developmental Disabilities*, *115*, 103963.
- Ash, A. C., Christopulos, T. T., & Redmond, S. M. (2020). “Tell me about your child”: A grounded theory study of mothers' understanding of language disorder. *American journal of speech-language pathology*, *29*(2), 819-840.
- Lyons, R., & Roulstone, S. (2018). Listening to the voice of children with developmental speech and language disorders using narrative inquiry: Methodological considerations. *Journal of Communication Disorders*, *72*, 16-25.

Advocacy and clinician perspectives

- McGregor, K. K., Goffman, L., Van Horne, A. O., Hogan, T. P., & Finestack, L. H. (2020). Developmental language disorder: Applications for advocacy, research, and clinical service. *Perspectives of the ASHA Special Interest Groups*, *5*(1), 38-46.

- Matić, A., Kuvač Kraljević, J., Kogovšek, D., Novšak Brce, J., & Roch, M. (2021). Developmental language disorder and associated misconceptions: a multi-country perspective. *Hrvatska revija za rehabilitacijska istraživanja*, *57*(1), 145-157.

I love the sound of all of all of this BUT I can’t access the articles to read ☹

I love the sound of all of all of this BUT I can't access the articles to read ☹

Is it open access? (freely accessible) If not:

- Email the author (we like it ☺)
- Have a look at the research group/author's website – many of us have learned about self-archiving thanks to @CSDisseminate; we now know about accepted versions/postprints and when we can post these to freely share

- Subscribe to a service such as @TheInformedSLP who do so much of the work for us!!

USE SPEECHBITE to stay up to date

http://www.speechbite.com/index.php

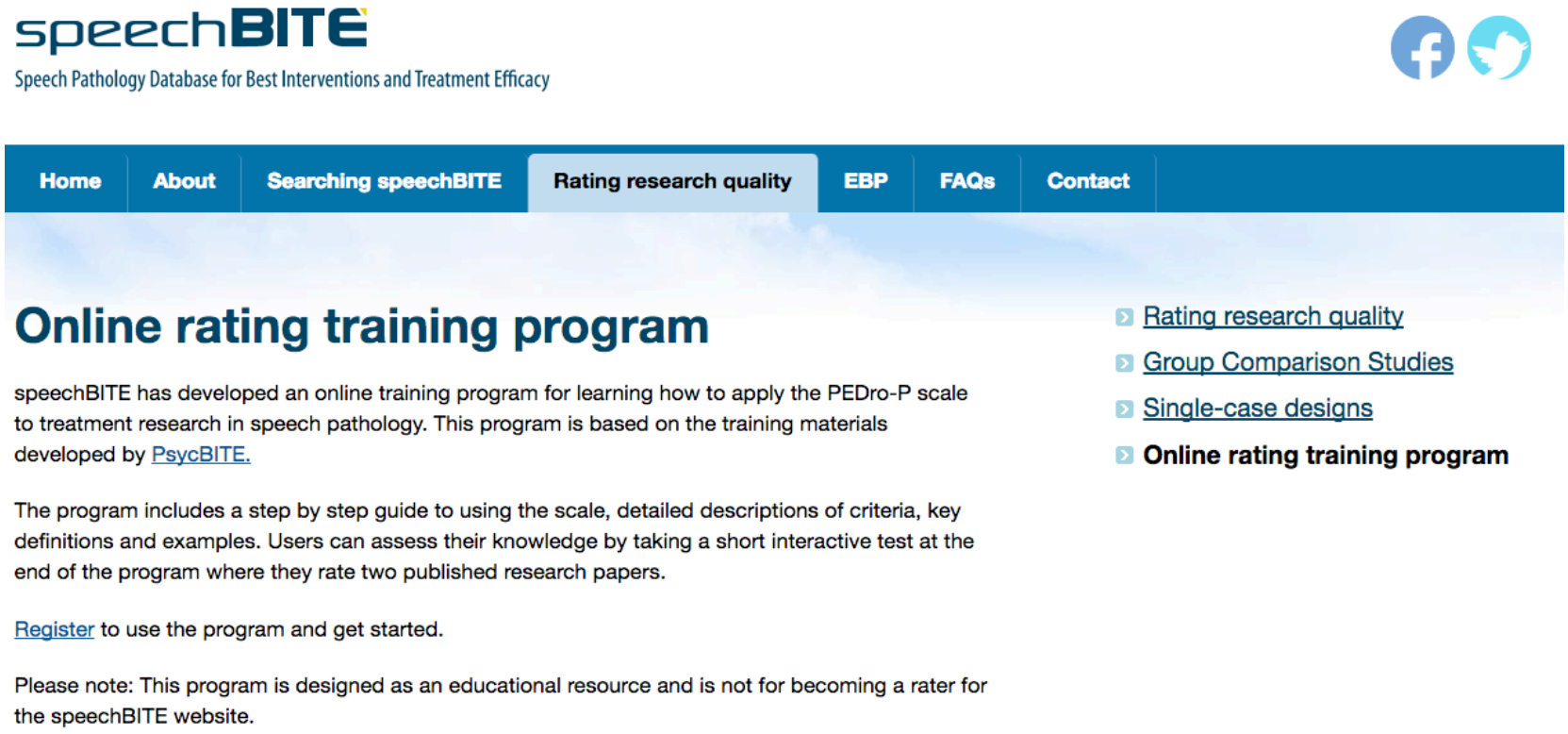
- SpeechBITE is a database of intervention studies across the scope of speech pathology practice. Keep up to date with recent treatment research in speech pathology.
- Sign up and speechBITE will send you monthly updates on the newest references added to the speechBITE database.

When I came to record version 4……

- Rinaldi, S., Caselli, M. C., Cofelice, V., D'Amico, S., De Cagno, A. G., Della Corte, G., ... & Zoccolotti, P. (2021). Efficacy of the Treatment of Developmental Language Disorder: A Systematic Review. *Brain Sciences*, *11*(3), 407.

Early intensive intervention in three- and four-year-old children has a positive effect on phonological expressive and receptive skills and acquisitions are maintained in the medium term. Less evidence is available on the treatment of expressive vocabulary (and no evidence on receptive vocabulary). Intervention on morphological and syntactic skills has effective results on expressive (but not receptive) skills; however, a number of inconsistent results have also been reported. Only one study reports a positive effect of treatment on inferential narrative skills. Limited evidence is also available on the treatment of meta-phonological skills. More studies investigated the effectiveness of interventions on general language skills, which now appears as a promising area of investigation, even though results are not all consistent. Conclusions. The effectiveness of interventions over expressive and receptive phonological skills, morpho-syntactic skills, as well as inferential skills in narrative context underscores the importance that these trainings be implemented in children with DLD.

USE SPEECHBITE to learn to evaluate the EB



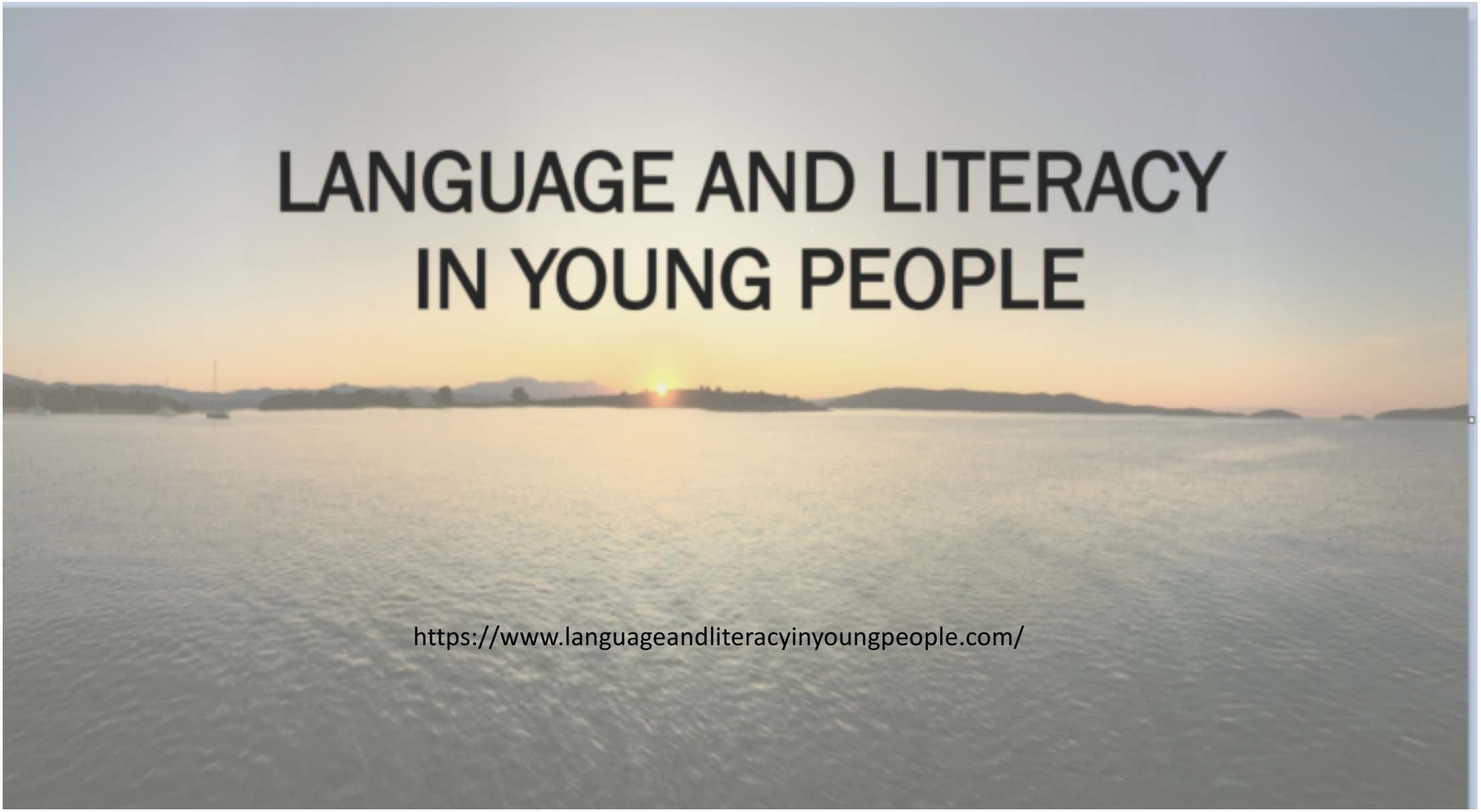
ASHA is another great site for EBP resources.

- You can start at the research page:

http://www.asha.org/research/

- Or for lots of reviews and guidelines go to:

http://www.asha.org/members/ebp/compendium/


LANGUAGE AND LITERACY
IN YOUNG PEOPLE
https://www.languageandliteracyinyoungpeople.com/

Here are some of the DLD people to follow on Twitter using #DevLangDis

Dorothy Bishop @deevybee
Courtney Norbury @lilaccourt
Susan Ebbels @SusanEbbels
Pamela Snow @PamelaSnow2
Tanya Serry @tserry2504
Stephen Parsons @WordAware
Julia Starling @JuliaStarling4
Natalie Munro @NatalieMunro3
Nathaniel Swain @NathanielRSwain
Lisa Archibald @larchiba6
Susan Rvachew @ProfRvach
Emina McLean @EminaMcLean
Becky Clarke @BeckyClark22
Haley Tancredi @HaleyTanc
Suze Leitao @Suze_Freogirl
Robert Wells @RobertPWells
Charlotte Forwood @talkinged19
Emily May Jackson @EmilyMayJackson
David Kinnane @speechbloke

Kathryn Thorburn @Lang_LearnSP
Karla McGregor @mcgregor_karla
Emily Dawes @EmilyDawesSLP
Laura Glisson @LauraGlisson
Mary Claessen @SpeechMary
Samuel Calder @SamuelDCalder
Shaun Ziegenfusz @ShaunZiegenfusz
Victoria Joffe @vjoffe
Billie Lowe @HilaryLowe2
Josephine Wallinger @jowallinger
Patricia Eadie @paeadie
Tim Kittel@TimothyKittel
Tiffany Hogan @tiffanyphogan
Lizz Hill @LizzHillSP
Tina Kilpatrick @tinakilpatrick1

Curtin University

@suze_freogirl

From research to the clinic:
Understanding and using intervention evidence

Suze Leitão, Associate Professor of Speech Pathology

Director of Graduate Research

Curtin School of Allied Health, Western Australia

S.Leitao@Curtin.edu.au

Presented online at the 1st International Developmental Language Disorder Research Conference (IDLDRC2021) 20-22 September 2021 – The DLD Project