Speech-Language Pathology Interventions for Children with Executive Function Deficits: A Systematic Literature Review

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Recommended Articles and Resources for Clinicians:

Jansen, S., Thompson, C., Mulder, A., & McFarlane, L.-A. (2010) Material development for language intervention with children with attention deficit hyperactivity disorder. *Perspectives on School-Based Issues, 11*(4), 118-125. https://doi.org/10.1044/sbi11.4.118

Ward, S., & Jacobsen, K. (2014). A clinical model for developing executive function skills. Perspectives on Language Learning and Education, 21(2), 72–84. https://doi.org/10.1044/lle21.2.72

https://www.efpractice.com/

https://www.smartbutscatteredkids.com/

https://www.architectsforlearning.com/

https://developingchild.harvard.edu/resourcetag/executive-function/

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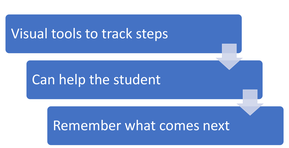
Results & Discussion

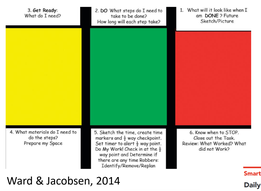
Empirical	Practitioner Papers
Quasi-Experimental: Direct instruction of strategies had positive impacts that persisted to re-evaluation 8 months later.	Principles of Intervention: Benefits to individualized plans that address memory processes and self-esteem in context. Discuss working memory training benefits being task-specific.
Single-Case: Need to be interpreted with caution! Some encouraging results, however inconsistent in applied techniques.	Interventions – Language Disorder: Instructions to combined language interventions with explicit strategies for executive function. Advocacy for variety of techniques.
Case Studies: Some encouraging results with a variety of strategies and collaboration with classroom teachers.	Interventions – EF & ADHD: Advocates for collaboration and instructional/environmental strategies, metacognitive strategies, and multi-sensory approaches.

*Note: Computerized Working Memory Training (CWMT) had short-term improvements in trained tasks, but no evidence for long-term, generalized improvements.

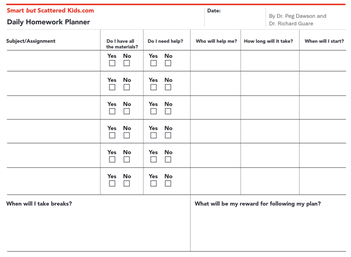
SLPs can address EF deficits through:

* Direct intervention
* Embedded within speech/language activities
* Indirect services such as accommodations (environmental & instructional) and consultation



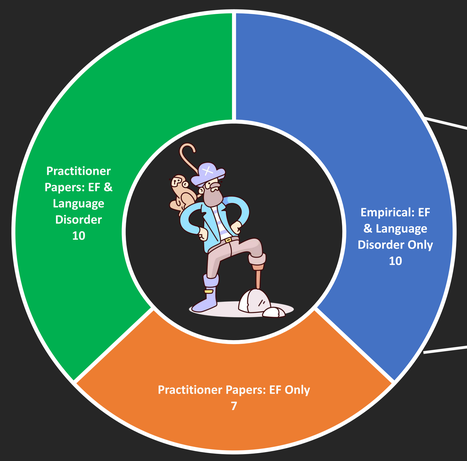


Ward & Jacobsen, 2014

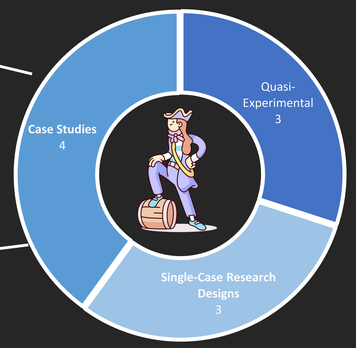


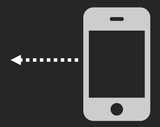
Many articles provide a **framework** for executive function **intervention, but few measure** their **effect** with children with **co-occurring language disorders.**

Composition of Included Articles



Composition of Empirical Articles





Take a picture to **download** the **full paper**

BACKGROUND

Present papers are inadequate for providing evidence-based practice for children with executive function (EF) deficits with co-occurring language disorder.

EF domain	Difference between SLI and typically-developing	Source
Working Memory (phonological)	-1.27 SDs	Graf Estes et al., 2007
Working Memory (visuospatial)	-0.63 SDs	Vugs et al., 2013
Inhibitory control	-0.56 SDs	Pauls & Archibald, 2016
Flexibility	-0.27 SDs	Pauls & Archibald, 2016

METHODS

1. **Identified 27 articles that fit criteria**
2. **Organized articles into empirical and non-empirical**
3. **Categorized content for each article**

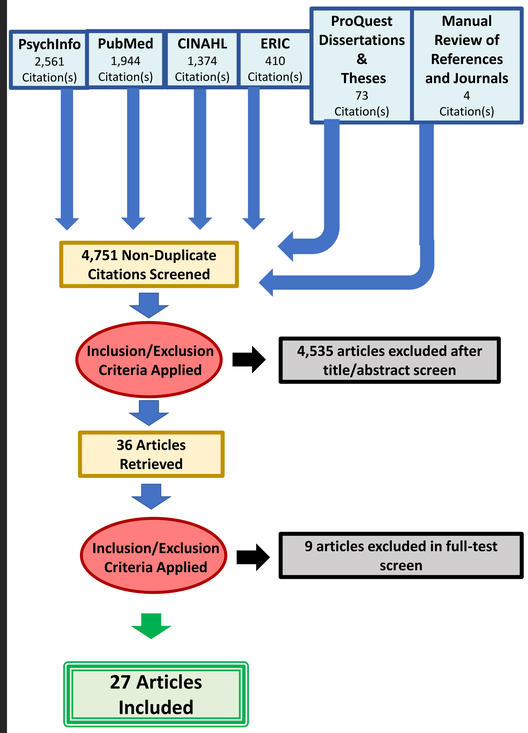


Table 1

Description of Included Empirical Studies: Case Studies, Single Case Designs, Quasi-experimental Designs

Author(s)	Date	Research Design	Population	EF Construct	*N*	Interventionist	Intervention	Outcome Variable
Clegg & Hartshorne	2004	Case studies	DLD + ADHD	ADHD/ Hyperactivity	2	School-based multidisciplinary (incl. SLP)	Indirect	Learning, language & communication
Datchuk et al.	2020	Single baseline design (Case study)	SLI + ADHD (hyper-activity and impulsivity)	ADHD	1	Researcher	Direct (language)	Correct writing sequences
Dunaway	2004	Narrative case study	ADHD	ADHD	1	SLP	Indirect	Not specified
Ebert	2014	Multiple-baselines design	DLD (2/3 w/ co-occurring ADHD)	WM, processing speed, sustained selective attention	3	SLP	Direct (language)	Task-based EF measures
Ebert & Kohnert	2009	Multiple-baselines design	PLI	Auditory memory	2	Not specified	Direct (EF)	Language and cognitive tasks
Gill et al.	2003	Quasi-experimental	DLD	Memory (following verbal instructions)	30	SLP	Direct (EF, language)	Oral Directions subtest score
Holmes et al.	2015	Quasi-experimental	DLD	Verbal memory	179	Cogmed trainer	Direct (EF)	Cognitive skills (e.g. verbal STM)
Shahmah-mood et al.	2018	Phased SCD	PLI	WM	10	SLP	Direct (EF, language)	WM, grammar

Singer & Bashir	1999	Case study	DLD	EF, SR	1	SLP	Direct (EF, language)	Academic achievement, communication
Stanford et al.	2019	Quasi-experimental	DLD	WM	42	Not specified	Direct (EF)	WM, language

DLD = Developmental Language Disorder, EF = Executive function, PLI = Primary Language Impairment, SCD = Single Case Design, SLP = Speech-language pathologist, SR = Self-regulation, STM = Short-term memory, WM = Working memory

Table 2

Description of Included Practitioner Papers: Tutorials, Narrative Reviews, Research Summaries

Author(s)	Date	Population	EF Construct	DLD Focus	Interventionist	Intervention	Outcome Variables
Boudreau & Costanza-Smith	2010	WM-impaired	WM	No	SLP	Direct (EF, language) and indirect	WM in the classroom
Damico et al.	1999	ADHD	ADHD/ Hyperactivity	No	SLP	Direct (EF, language) and indirect	Not specified
Damico & Armstrong	1996	ADHD	ADHD/ Hyperactivity	No	SLP	Direct (unspecified) and indirect	Not specified
Drazinski	2014	EF-impaired	Developmental EF deficits, TBI	No	SLP	Principles of intervention	Not specified
Fahy & Browning	2021	DLD + EF	Reasoning, planning	Yes	SLP	Direct (EF, language)	Planning, reasoning
Gathercole & Alloway	2006	Neuro-developmental disorders (incl. SLI, ADHD)	WM	No	Not specified	Direct (EF) and indirect	WM
Gillam	1997	DLD	Memory	Yes	SLP	Principles of intervention	Not specified

Gillam et al.	2018	DLD, WM-impaired	Long-term memory retrieval	Yes	SLP	Direct (EF)	WM
Gillam et al.	2019	DLD	Cognitive processing	Yes	SLP	Direct (language)	Language
Jansen et al.	2010	DLD + ADHD	ADHD	Yes	SLPs and educators	Direct (EF, language)	Language and learning
Meltzer et al.	2021	DLD + EF	Various EFs	Yes	SLP	Direct (EF)	Student success
Montgomery	2003	SLI	WM	Yes	Clinician	Direct (EF, language)	Language and learning
Montgomery et al.	2010	SLI	WM	Yes	Not specified	Direct (EF)	WM, cognitive processes
Montgomery et al.	2021	DLD	WM	Yes	Not specified	Direct (language)	Learning and Language
Nelson & Hawley	2004	ADHD	Inner control	No	SLP	Direct (language)	Inner control
Singer & Bashir	2018	Low WM	Verbal WM	Yes	SLP	Principles of intervention	Not specified
Westby & Cutler	1994	ADHD	ADHD	No	Not specified	Direct (EF)	Academics, social interactions, self-regulation

CWMT = Computerized working memory training, DLD = Developmental Language Disorder, EF = Executive function, SLI = Specific Language Impairment, SLP = Speech-language pathologist, WM = Working memory

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