

**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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PRESENTERS:
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Results & Discussion

Empirical

Quasi-Experimental:
Direct instruction of strategies had positive impacts that persisted to re-evaluation 8 months later.

Single-Case:
Need to be interpreted with caution! Some encouraging results, however inconsistent in applied techniques.

Case Studies:
Some encouraging results with a variety of strategies and collaboration with classroom teachers.

Practitioner Papers

Principles of Intervention:
Benefits to individualized plans that address memory processes and self-esteem in context. Discuss working memory training benefits being task-specific.

Interventions – Language Disorder:
Instructions to combined language interventions with explicit strategies for executive function. Advocacy for variety of techniques.

Interventions – EF & ADHD:
Advocates for collaboration and instructional/environmental strategies, metacognitive strategies, and multi-sensory approaches.

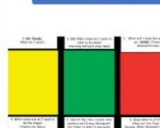
*Note: Computerized Working Memory Training (CWMT) had short-term improvements in trained tasks, but no evidence for long-term, generalized improvements.

SLPs can address EF deficits through:

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

Visual tools to track steps

- Can help the student
- Remember what comes next

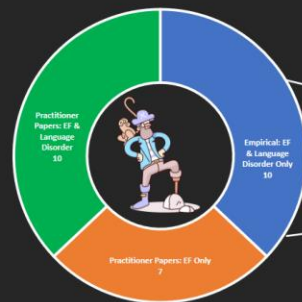


Word & Jennings, 2016

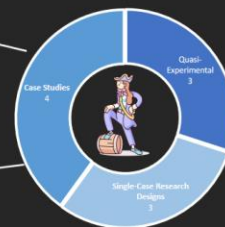
Student	Baseline	Intervention	Follow-up
Student 1	100%	100%	100%
Student 2	100%	100%	100%
Student 3	100%	100%	100%
Student 4	100%	100%	100%
Student 5	100%	100%	100%
Student 6	100%	100%	100%
Student 7	100%	100%	100%
Student 8	100%	100%	100%
Student 9	100%	100%	100%
Student 10	100%	100%	100%

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

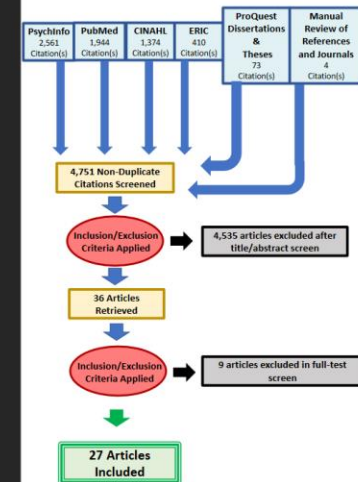
BACKGROUND

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



To see the poster in full resolution, go to: <https://raw.githubusercontent.com/rrsenter/MyWebsite/gh-pages/Poster.pdf>

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)
Shahmahmood 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

References

- American Speech-Language-Hearing Association. (2020). *2020 Schools Survey report: SLP caseload and workload characteristics*.
www.asha.org/Research/memberdata/Schools-Survey/
- American Speech-Language-Hearing Association. (n.d.). *Key Steps in Infusing Evidence into CE Course Content: Step 2*. <https://www.asha.org/ce/for-providers/EBCEStep2/>
- Au, J., Sheehan, E., Tsai, N., Duncan, G. J., Buschkuehl, M., & Jaeggi, S. M. (2015). Improving fluid intelligence with training on working memory: a meta-analysis. *Psychonomic Bulletin & Review*, 22(2), 366-377.
- Autin, F., & Croizet, J. (2012). Improving working memory efficiency by reframing metacognitive interpretation of task difficulty. *Journal of Experimental Psychology: General*, American Psychological Association, 141(4), 610-618.
<https://doi.org/10.1037/a0027478>
- Barkley, R. A. (Ed.) (2018). *Attention deficit hyperactivity disorder: A handbook for diagnosis and treatment (Fourth edition)*. Guilford Press.
- Best, J. R., Miller, P. H., & Naglieri, J. A. (2011). Relations between executive function and academic achievement from ages 5 to 17 in a large, representative national sample. *Learning and individual differences*, 21(4), 327-336.
- Bierman, K. L., Nix, R. L., Greenberg, M. T., Blair, C., & Domitrovich, C. E. (2008). Executive functions and school readiness intervention: Impact, moderation, and mediation in the Head Start REDI program. *Development and Psychopathology*, 20(3), 821.
- Bishop, D. V., Snowling, M. J., Thompson, P. A., Greenhalgh, T., & the Catalise-2 Consortium. (2017). Phase 2 of CATALISE: A multinational and multidisciplinary Delphi consensus

study of problems with language development: Terminology. *Journal of Child Psychology and Psychiatry*, 58(10), 1068-1080.

*Boudreau, D., & Costanza-Smith, A. (2011). Assessment and treatment of working memory deficits in school-age children: the role of the speech-language pathologist. *Language, Speech, and Hearing Services in Schools*, 42(2), 152–166.
[https://doi.org/10.1044/0161-1461\(2010/09-0088\)](https://doi.org/10.1044/0161-1461(2010/09-0088))

Brown, T. E. (2005). *Attention Deficit Disorder; The Unfocused Mind in Children and Adults*. Yale University Press Health and Wellness.

Brien, A., Hutchins, T. L., & Westby, C. (2021). Autobiographical Memory in Autism Spectrum Disorder, Attention-Deficit/Hyperactivity Disorder, Hearing Loss, and Childhood Trauma: Implications for Social Communication Intervention. *Language, Speech, and Hearing Services in Schools*, 52(1), 239-259.

Cambourne, B. (1988). *The Whole Story*. Auckland, NZ: Ashton Scholastic.

*Clegg, J., & Hartshorne, M. (2004). Speech and language therapy in hyperactivity: a United Kingdom perspective in complex cases. *Seminars in Speech and Language*, 25(3), 263–270. <https://doi.org/10.1055/s-2004-833674>

Constantinidou, F., Wertheimer, J. C., Tsanadis, J., Evans, C., & Paul, D. R. (2012). Assessment of executive functioning in brain injury: Collaboration between speech-language pathology and neuropsychology for an integrative neuropsychological perspective. *Brain Injury*, 26(13-14), 1549-1563.

Dachtyl, S. A., & Morales, P. (2017). A collaborative model for return to academics after concussion: Athletic training and speech-language pathology. *American Journal of Speech-Language Pathology*, 26(3), 716-728.

- *Damico, S. K., & Armstrong, M. B. (1996). Intervention strategies for students with ADHD: creating a holistic approach. *Seminars in Speech and Language*, 17(1), 21–92.
- *Damico, J. S., Damico, S. K., & Armstrong, M. B. (1999). Attention-deficit hyperactivity disorder and communication disorders: Issues and clinical practices. *Child and Adolescent Psychiatric Clinics of North America*, 8(1), 37–60.
- *Datchuk, S. M., Poch, A. L., & Panos, K. (2020). Improving the sentence writing fluency of a student with Attention Deficit Hyperactivity Disorder and Speech/Language Impairment: A pilot study. *Insights into Learning Disabilities*, 17(2), 163–178.
- Dawson, P., & Guare, R. (2009). *Smart but Scattered*. Guilford Press.
- Diamond, A. (2013). Executive functions. *Annual Review of Psychology*, 64, 135–168.
- Diamond, A., & Ling, D. S. (2019). Review of the evidence on, and fundamental questions about, efforts to improve executive functions, including working memory. *Cognitive and Working Memory Training: Perspectives from Psychology, Neuroscience, and Human Development*. <https://doi.org/10.1093/oso/9780199974467.003.0008>
- *Drazinski, L. (2014). Acquired and Developmental Executive Dysfunction: Common Intervention Principles. *Perspectives on School-Based Issues*, 15(4), 134–140.
- *Dunaway, C. (2004). Attention deficit hyperactivity disorder: an authentic story in the schools and its implications. *Seminars in Speech and Language*, 25(3), 271–275.
<https://doi.org/10.1055/s-2004-833675>
- DuPaul, G. J., & Stoner, G. (2014). *ADHD in the schools: Assessment and intervention strategies*. Guilford Publications.
- Durkin, K., Toseeb, U., Botting, N., Pickles, A., & Conti-Ramsden, G. (2017). Social confidence in early adulthood among young people with and without a history of

language impairment. *Journal of Speech, Language, and Hearing Research*, 60(6), 1635-1647https://doi.org/10.1044/2017_JSLHR-L-16-0256

*Ebert, K. D. (2014). Nonlinguistic cognitive effects of language treatment for children with primary language impairment. *Communication Disorders Quarterly*, 35(4), 216–225.
<https://doi.org/10.1177/1525740114523311>

*Ebert, K. D., & Kohnert, K. (2009). Non-Linguistic Cognitive Treatment for Primary Language Impairment. *Clinical Linguistics & Phonetics*, 23(9), 647–664.

Evans, J. L., Gillam, R. B., & Montgomery, J. W. (2018). Cognitive predictors of spoken word recognition in children with and without developmental language disorders. *Journal of Speech, Language, and Hearing Research*, 61(6), 1409-1425.

Fahy, J. K. (2014). Assessment of Executive Functions in School-Aged Children: Challenges and Solutions for the SLP. *Perspectives on School-Based Issues*, 15(4), 151-163.

*Fahy, J. K., & Browning, D. K. (2021). Adolescent language therapy: Syntax and semantics for reasoning and planning. *Perspectives of the ASHA Special Interest Groups*, 6(6), 1327–1342. https://doi.org/10.1044/2021_PERSP-21-00017

*Gathercole, S. E., & Alloway, T. P. (2006). Practitioner review: short-term and working memory impairments in neurodevelopmental disorders: diagnosis and remedial support. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, 47(1), 4–15.
<https://doi.org/10.1111/j.1469-7610.2005.01446.x>

Gathercole, S. E., Alloway, T. P., Willis, C., & Adams, A. (2006). Working memory in children with reading disabilities. *Journal of Experimental Child Psychology*, 93, 265-281.

*Gill, C. B., Klecan-Aker, J., Roberts, T., & Fredenburgh, K. A. (2003). Following directions: rehearsal and visualization strategies for children with specific language impairment.

Child Language Teaching & Therapy, 19(1), 85–103.

<https://doi.org/10.1191/0265659003ct245oa>

*Gillam, R. B. (1997). Putting memory to work in language intervention: Implications for practitioners. *Topics in Language Disorders*, 18(1), 72–79.

<https://doi.org/10.1097/00011363-199711000-00008>

Gillam, R. B., Gillam, S. L., & Fey, M. E. (2017). Supporting knowledge in language and literacy (SKILL): A narrative-based language intervention. In McCauley, R. J., Fey, M. E., & Gillam, R. B. (Eds.), *Treatment of Language Disorders* (2nd ed., pp. 389-420). Brookes.

*Gillam, R. B., Montgomery, J. W., Evans, J. L., & Gillam, S. L. (2019). Cognitive predictors of sentence comprehension in children with and without developmental language disorder: Implications for assessment and treatment. *International Journal of Speech Language Pathology*, 21(3), 240–251. <https://doi.org/10.1080/17549507.2018.1559883>

Gillam, S. L., Gillam, R. B., & Rogers, C. L. (2018) *Supporting knowledge in language and literacy* (3rd ed.). Utah State University.

*Gillam, S., Holbrook, S., Mecham, J., & Weller, D. (2018). Pull the Andon Rope on working memory capacity interventions until we know more. *Language, Speech, and Hearing Services in Schools*, 49(3), 434–448. https://doi.org/10.1044/2018_LSHSS-17-0121

Graf Estes, K., Evans, J. L., & Else-Quest, N. M. (2007). Differences in the nonword repetition performance of children with and without specific language impairment: A meta-analysis. *Journal of Speech, Language, and Hearing Research*, 51(1), 177-195.

[https://doi.org/10.1044/1092-4388\(2007/015\)](https://doi.org/10.1044/1092-4388(2007/015))

Haarbauer-Krupa, J. (2012). Taking care of children after traumatic brain injury. *Perspectives*

on School-Based Issues, 13(3), 79-86.

*Holmes, J., Butterfield, S., Cormack, F., van Loenhoud, A., Ruggero, L., Kashikar, L., & Gathercole, S. (2015). Improving working memory in children with low language abilities. *Frontiers in Psychology*, 6. <https://doi.org/10.3389/fpsyg.2015.00519>

Horner, R. H., Carr, E. G., Halle, J., McGee, G., Odom, S., & Wolery, M. (2005). The use of single-subject research to identify evidence-based practice in special education. *Exceptional Children*, 71(2), 165-179.

Hughes, C., White, A., Sharpen, J., & Dunn, J. (2000). Antisocial, angry, and unsympathetic: "Hard-to-manage" preschoolers' peer problems and possible cognitive influences. *Journal of Child Psychology and Psychiatry*, 41(2), 169-179.

*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>

Jones, S. M., Bailey, R., Barnes, S. P., & Partee, A. (2016). *Executive Function Mapping Project: Untangling the Terms and Skills Related to Executive Function and Self regulation in Early Childhood* (OPRE Report # 2016-88). Office of Planning, Research, and Evaluation.

Karbach, J., & Verhaeghen, P. (2014). Making working memory work: a meta-analysis of executive-control and working memory training in older adults. *Psychological Science*, 25(11), 2027-2037.

Klingberg, T. (2001). *Cogmed Working Memory Training* [Computer software]. Pearson Education. <https://www.cogmed.com/>

- Ledford, J., Barton, E., Severini, K., & Zimmerman, K. (2019). A primer on single-case research designs: Contemporary use and analysis. *American Journal on Intellectual and Developmental Disabilities, 124*(1), 35–56. <https://doi.org/10.1352/1944-7558-124.1.35>
- Melby-Lervåg, M., & Hulme, C. (2013). Is working memory training effective? A meta-analytic review. *Developmental Psychology, 49*(2), 270–291. <https://doi.org/10.1037/a0028228>
- Melby-Lervåg, M., Redick, T. S., & Hulme, C. (2016). Working memory training does not improve performance on measures of intelligence or other measures of “far transfer” evidence from a meta-analytic review. *Perspectives on Psychological Science, 11*(4), 512-534.
- *Meltzer, L., Greschler, M. A., Davis, K., & Vanderberg, C. (2021). Executive function, metacognition, and language: Promoting student success with explicit strategy instruction. *Perspectives of the ASHA Special Interest Groups, 6*(6), 1343–1356. https://doi.org/10.1044/2021_PERSP-21-00034
- Miyake, A., Friedman, N. P., Emerson, M. J., Witzki, A. H., Howerter, A., & Wager, T. D. (2000). The unity and diversity of executive functions and their contributions to complex “frontal lobe” tasks: A latent variable analysis. *Cognitive Psychology, 41*(1), 49-100.
- *Montgomery, J. W. (2003). Working memory and comprehension in children with specific language impairment: what we know so far. *Journal of Communication Disorders, 36*(3), 221–231. [https://doi.org/10.1016/s0021-9924\(03\)00021-2](https://doi.org/10.1016/s0021-9924(03)00021-2)
- *Montgomery, J. W., Gillam, R. B., & Evans, J. L. (2021). A new memory perspective on the sentence comprehension deficits of school-age children with Developmental Language Disorder: Implications for theory, assessment, and intervention. *Language, Speech, and Hearing Services in Schools, 52*(2), 449-466.

https://doi.org/10.1044/2021_LSHSS-20-00128

*Montgomery, J. W., Magimairaj, B. M., & Finney, M. C. (2010). Working memory and specific language impairment: An update on the relation and perspectives on assessment and treatment. *American Journal of Speech-Language Pathology*, 19(1), 78–94.

[https://doi.org/10.1044/1058-0360\(2009/09-0028\)](https://doi.org/10.1044/1058-0360(2009/09-0028))

Morrow, E. L., Turkstra, L. S., & Duff, M. C. (2021). Confidence and training of speech-language pathologists in cognitive-communication disorders: Time to rethink graduate education models? *American Journal of Speech-Language Pathology*, 16(30), 986-992. DOI: [10.1044/2020_AJSLP-20-00073](https://doi.org/10.1044/2020_AJSLP-20-00073)

*Nelson, R. L., & Hawley, H. K. (2004). Inner control as an operational mechanism in attention deficit hyperactivity disorder. *Seminars in Speech and Language*, 25(3), 255–261.

<https://doi.org/10.1055/s-2004-833673>

Nigg, J. T., Quamma, J. P., Greenberg, M. T., & Kusche, C. A. (1999). A two-year longitudinal study of neuropsychological and cognitive performance in relation to behavioral problems and competencies in elementary school children. *Journal of Abnormal Child Psychology*, 27(1), 51-63.

Norbury, C. F., Gooch, D., Wray, C., Baird, G., Charman, T., Simonoff, E., Vamvakas, G., & Pickles, A. (2016). The impact of nonverbal ability on prevalence and clinical presentation of language disorder: evidence from a population study. *Journal of Child Psychology and Psychiatry*, 57(11), 1247–1257. <https://doi.org/10.1111/jcpp.12573>

Ouzzani, M., Hammady, H., Fedorowicz, Z., & Elmagarmid, A. (2016). Rayyan- a web and mobile app for systematic reviews. *Systematic Reviews*, (5)210.

<https://doi.org/10.1186/s13643-016-0384-4>

- Page, M. J., Moher, D., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., ... & McKenzie, J. E. (2021). PRISMA 2020 explanation and elaboration: Updated guidance and exemplars for reporting systematic reviews. *BMJ*, 372.
- Pauls, L. J., & Archibald, L. M. (2016). Executive functions in children with specific language impairment: A meta-analysis. *Journal of Speech, Language, and Hearing Research*, 59(5), 1074-1086.
- Prath, S. (2019). Helping Students With Executive Functions--What Is Our Role as SLPs? *ASHA Leader*, 24(9), 36–39. <https://doi.org/10.1044/leader.scm.24092019.36>
- Randall, L., & Tyldesley, K. (2016). Evaluating the impact of working memory training programmes on children--A systematic review. *Educational & Child Psychology*, 33(1), 34-50.
- Raver, C. C., Jones, S. M., Li-Grining, C., Zhai, F., Bub, K., & Pressler, E. (2011). CSRP's impact on low-income preschoolers' preacademic skills: self-regulation as a mediating mechanism. *Child Development*, 82(1), 362-378.
- Redmond, S. M. (2020). Clinical Intersections Among Idiopathic Language Disorder, Social (Pragmatic) Communication Disorder, and Attention-Deficit/Hyperactivity Disorder. *Journal of Speech, Language, and Hearing Research*, 63(10), 3263-3276.
- Robey, R. R. (2004). Levels of evidence. *The ASHA Leader*, 9(8).
<https://doi.org/10.1044/leader.FTR2.09072004.5>
- Sala, G., & Gobet, F. (2017). Working memory training in typically developing children: A meta-analysis of the available evidence. *Developmental Psychology*, 53(4), 671-685.
- Salis, C., Murray, L., & Bakas, K. (2018). An international survey of assessment practices for short-term and working memory deficits in aphasia. *American Journal of*

Speech-Language Pathology, 27(2), 574-591.

Schwaighofer, M., Fischer, F., & Bühner, M. (2015). Does working memory training transfer? A meta-analysis including training conditions as moderators. *Educational Psychologist*, 50(2), 138-166.

*Shahmahmood, T. M., Zahra, S., AliPasha, M., Ali, M., & Shahin, N. (2018). Cognitive and language intervention in Primary Language Impairment: Studying the effectiveness of working memory training and direct language intervention on expansion of grammar and working memory capacities. *Child Language Teaching and Therapy*, 34(3), 235–268.
<https://doi.org/10.1177/0265659018793696>

*Singer, B. D., & Bashir, A. S. (1999). What are executive functions and self-regulation and what do they have to do with language-learning disorders? *Language, Speech, and Hearing Services in Schools*, 30, 265–273. <https://doi.org/10.1044/0161-1461.3003.265>

*Singer, B. D., & Bashir, A. S. (2018). Wait...what??? Guiding intervention principles for students with verbal working memory limitations. *Language, Speech, and Hearing Services in Schools*, 49(3), 449–462. https://doi.org/10.1044/2018_LSHSS-17-0101

*Stanford, E., Durrleman, S., & Delage, H. (2019). The effect of working memory training on a clinical marker of French-speaking children with Developmental Language Disorder. *American Journal of Speech-Language Pathology*, 28(4), 1388–1410.
https://doi.org/10.1044/2019_AJSLP-18-0238

Strong, G. K., Torgerson, C. J., Torgerson, D., & Hulme, C. (2011). A systematic meta-analytic review of evidence for the effectiveness of the ‘Fast ForWord’ language intervention program. *Journal of Child Psychology and Psychiatry*, 52(3), 224-235.

Timler, G. R., & White, K. E. (2015). Social communication assessment and intervention for

children with attention problems. *Social Communication Development and Disorders*, 252-286.

Vugs, B., Hendriks, M., Cuperus, J., & Verhoeven, L. (2014). Working memory performance and executive function behaviors in young children with SLI. *Research in Developmental Disabilities*, 35(1), 62-74.

Wallace, E. S., Senter, R., Peterson, N., Dunn, K. T., & Chow, J. (2021). How to establish a language-rich environment through a collaborative SLP-teacher partnership. *TEACHING Exceptional Children*. <https://doi.org/10.1177/0040059921990690>

*Westby, C. E., & Cutler, S. K. (1994). Language and ADHD: Understanding the bases and treatment of self-regulatory deficits. *Topics in Language Disorders*, 14(4), 58–76.
<https://doi.org/10.1097/00011363-199408000-00006>

What Works Clearinghouse. (2014). What Works Clearinghouse procedures and standards handbook. *Version 3.0*, 1-91.

Young, A. R., Beitchman, J. H., Johnson, C., Douglas, L., Atkinson, L., Escobar, M., & Wilson, B. (2002). Young adult academic outcomes in a longitudinal sample of early identified language impaired and control children. *Journal of Child Psychology and Psychiatry*, 43(5), 635-645.