

What's Language Got to Do With It? Speech-Language Pathology Contributions to the Science of Reading

by Tiffany P. Hogan

Published in *The Reading League Journal* – September/October 2022 Edition

The Reading League Journal is distributed via a paid subscription. We encourage you to log onto our website, thereadingleague.org/journal, to learn more about *The Reading League Journal* and subscribe today.

Shared with permission.

Copyright 2022 by The Reading League®

ISSN: 2691-7955



All rights reserved. No part of this publication may be reproduced, stored, transmitted, or disseminated in any form without the express written consent of The Reading League. The Reading League assumes no responsibility for any statements of fact or opinion expressed in the article.

What's Language Got to Do With It? Speech-Language Pathology Contributions to the Science of Reading

by Tiffany P. Hogan

In the first few years of my career as a practicing speech-language pathologist (SLP), three consistent patterns emerged related to speech and language development and reading abilities, and 25 years later, these patterns still hold. *Pattern 1:* I provide direct therapy to a preschool child for speech and/or language delays. After some time, the child makes significant progress and is either dismissed from services or shows improvement but continues to be supported by another SLP in an elementary school. A few years later, I receive an email from the child's caregivers telling me that the child is now struggling academically. I am asked, "Is this connected to his early speech and language delays?" *Pattern 2:* Caregivers schedule a speech and language evaluation for their child in third grade as part of a broader search for reasons why the child is falling behind school-based, grade-level expectations. During the evaluation, the caregivers note that the child was a late talker, which resulted in a discussion with their pediatrician. They were told that the child would grow out of it. Also, previous elementary school teachers noted that the child was shy, hesitant, and a bit immature. *Pattern 3:* Caregivers reach out to me for advice. Their child has been diagnosed with multiple disorders, and they are determining appropriate support services to improve reading abilities. They tell me that their child had a developmental delay at age 2, had a speech and language impairment at age 4, and recently was diagnosed with a specific learning disability. They ask, "Are these disorders related?" In this paper I will describe how these scenarios are commonplace for pediatric speech-language pathologists and how they have driven the field's contributions to the science of reading.

The Role of Speech-Language Pathology in the Science of Reading

Speech-language pathologists (SLPs) are certified to practice after attaining a master's degree and completing a supervised clinical fellowship year. They have a wide scope of practice that includes preventing, assessing, diagnosing, and treating speech, language, social communication, cognitive communication, and swallowing disorders in children and adults. SLPs work in research, health care, and educational settings, with more than half working in school settings. The majority of an SLP's school-based caseload includes children with speech and/or language disorders. A speech disorder is when a child has difficulty producing the speech sounds that make up words (e.g., saying /top/ for /stop/), and a language disorder is when a child has difficulty understanding or using language (i.e., words, grammar, connecting sentences to tell and understand stories, and using language to socialize). Service delivery models include one-on-one direct assessment and intervention, small group intervention, and collaboration with general and special ed-

ucators to support children with speech and/or language disorders in the classroom. In 2001, SLPs' U.S.-based governing body, the American Speech-Language-Hearing Association (ASHA), released a position statement titled *Roles and Responsibilities of Speech-Language Pathologists With Respect to Reading and Writing in Children and Adolescents*. This statement affirms the link between speech and language skills and reading and writing abilities; it also highlights that "[SLPs'] knowledge of normal and disordered language acquisition, and their clinical experience in developing individualized programs for children and adolescents" make them critical members of school-based literacy teams. The International Dyslexia Association (n.d.) notes that SLPs are among several professionals who can diagnose and treat dyslexia, if they have training and experience with reading assessments and interventions.

SLPs' Key Contributions to the Science of Reading: The Language Basis of Reading

In 1925, Dr. Samuel Orton was one of the first to note that dyslexia was part of a broader set

The International Dyslexia Association (n.d.) notes that SLPs are among several professionals who can diagnose and treat dyslexia, if they have training and experience with reading assessments and interventions.

of developmental language disorders when he observed that many with reading difficulties had a history of language delays (Richardson, 1992). Half a century later, several SLP groups published converging data from multiple child samples linking early speech and language impairment to later reading difficulty (e.g., Hall & Tomblin, 1978; Aram & Nation, 1980; Catts, 1993). These findings were expanded upon extensively by SLPs Catts, Kamhi, and colleagues through their seminal papers on the language basis of typical reading and reading disorders (reviewed in Catts & Kamhi, 2012).

How exactly does language underpin reading? Many practitioners are aware of the Simple View of Reading wherein word reading and language comprehension¹ comprise reading comprehension (Gough & Tunmer, 1986). Figure 1 shows how components of language (i.e., form, use, and content; Bloom & Lahey, 1978) support reading comprehension through word reading and language and language comprehension. Language con-

sists of the form of language (sounds), the content of language (vocabulary and grammar), and the use of language (pragmatics). Word reading is primarily related to the form of language as children learn to connect letters and sounds. Language comprehension is primarily related to the content and use of language as children use their vocabulary, grammar, and social knowledge of language to comprehend. As children develop the form, content, and use of language, they are, in turn, developing the foundations of reading comprehension. When children have difficulty with any of these language components, it follows that they have difficulty with word reading and/or language comprehension and, by extension, reading comprehension.

SLPs' Key Contributions to the Science of Reading: Poor Reader Subgroups

Using the Simple View of Reading, SLPs, amongst others, have characterized struggling readers as shown in Figure 2. The labels used for each quadrant have changed over time, though the main tenets hold: children have poor reading comprehension for one of two primary reasons—poor word reading or poor language comprehension, and oftentimes both. A large, longitudinal study of children with and without language delays followed children who matriculated through elementary school. Children were tested in Grades K, 2, and 4 and again in Grades 8, 10, and 12. This sample is referred to in the SLP field as “The Iowa Study” (Tomblin et al., 1997) based on its

¹While it is recognized that there are slight technical distinctions between language comprehension and listening comprehension, in this article these terms are both referring to the same thing.

Figure 1

The Language Basis of Reading: Form, Use, and Content Related to Word Reading and Language Comprehension



Figure 2

Poor Reader Subgroups: Dyslexia, Developmental Language Disorder, or Both

		Language Comprehension	
		<i>Good</i>	<i>Poor</i>
Word Reading	<i>Poor</i>	Dyslexia	Dyslexia + Developmental Language Disorder
	<i>Good</i>		Developmental Language Disorder

Note: Adapted from a figure in Adlof & Hogan (2018).

location. Over 100 papers have been published using this sample, including many on the language basis of reading. One seminal paper (Catts et al., 2003) selected those who scored low on a composite measure of reading comprehension. Those children were further categorized as having poor or good word reading and language comprehension. Though scores were on a continuum, children were divided into subgroups of poor readers with relative strengths and weaknesses.

The first such subgroup had good language comprehension and poor word reading. We labeled them as having *dyslexia*, because their poor reading comprehension was a result of poor word reading, a primary defining characteristic of dyslexia. Because of good language comprehension, if a text was read to them, they understood it well. Dyslexia is a neurobiological brain difference that makes learning to read words difficult and is present in 10% of children. Research by SLPs has contributed to converging evidence that children with dyslexia have a primary language deficit in phonological processing that is linked to early speech impairment, speaking rate, difficulty repeating nonwords, and trouble learning the names of objects. They are also at risk for reduced vocabulary over time due to less time reading. SLP-based research has also begun to highlight cognitive-linguistic strengths in children with dyslexia. Of note,

children with poor word reading don't all have dyslexia because other factors may contribute to poor word reading, such as poor reading instruction or limited English proficiency.

On the opposite side of the quadrant were children with good word reading but poor language comprehension. In other words, their reading comprehension was constrained by poor language comprehension: though they could read words accurately, they could not understand the language created by those words. This subgroup has been referred to as poor comprehenders or specific comprehension deficit. Recently, I have referred to them as children with Developmental Language Disorder (DLD) to represent converging evidence tying early language deficits associated with DLD to later poor reading comprehension (Catts et al., 2002). Children with DLD have a neurobiological brain difference that makes using and understanding language difficult (McGregor, 2020). This difficulty cannot be explained by other factors such as intellectual disability, a traumatic brain injury, or extreme language deprivation (McGregor et al., 2020). DLD is as prevalent as dyslexia or ADHD: 10% of children—1 to 2 in every classroom—have DLD (Tomblin et al., 1997). Children with DLD follow a similar language developmental trajectory as their peers with typical language abilities, but they start speaking later—a trajectory that

A primary focus of SLP research is to test ways to improve assessments of language comprehension and interventions to stimulate language skills that underpin language comprehension.

has been characterized as a train leaving the station late but following the same track. First, children with DLD are late talkers; they have fewer than 50 words and no two-word combinations at age 2. Then, when language skills begin to emerge, they have difficulty learning new words, and they have immature grammar. In early elementary school, children with DLD tell less cohesive and detailed stories, and most have poor language comprehension. Of note, children who have this profile don't necessarily meet the clinical definition of DLD; they could also be children who have other language comprehension deficits, including those who have limited English proficiency, attentional deficits, and/or limited background knowledge.

A third subgroup was those with dyslexia + DLD. Approximately 50% of those with DLD had poor word reading and vice versa (Adlof & Hogan, 2018). The subgroup's stability was relatively high from 2nd to 8th grade, such that a child in a specific subgroup in 2nd grade was likely to be in that same subgroup in 8th grade. SLPs further characterize these subgroups of poor readers by continuing to add pertinent information about things such as their academic performance, working memory, phonological abilities, spelling abilities, word learning, and response to intervention.

Based on these subgroups, I can confidently answer how to best support a poor reader after I learn all that I can about their word reading, language comprehension, and other relevant factors, such as developmental history, background knowledge, additional learning disabilities, and English language skills. In my research and clinical experience, there are often children who have the same low score on a reading comprehension test from each subgroup, which showcases the multiple pathways to poor reading comprehension: some had low comprehension due to poor word reading, and others had the same low comprehension due to poor language comprehension.

These findings were replicated and extended by another large, SLP-led, longitudinal study of children tested each year in pre-K through 3rd grade. This U.S. study included children from 4 states across the nation. In Language and Reading Research Consortium (LARRC) and Chiu (2018), a high correlation was found between pre-K, code-related skills (e.g., print knowledge, phonological awareness) and 3rd grade word reading, and between pre-K language comprehension measures (e.g., vocabulary, inferencing) and 3rd grade language comprehension. Almost all of the individual differences in 3rd grade reading comprehension were explained by 3rd grade word reading and language comprehension. The results are portrayed in Figure 3 (Komesidou & Hogan, 2020). It is clear from these studies and others that early speech and language skills are a crystal ball into a child's future reading skills. Though not 100% accurate, a child's early speech and language skills are good indicators of later reading comprehension (Catts et al., 2001), a fact that has been the foundation of early identification in current school practice.

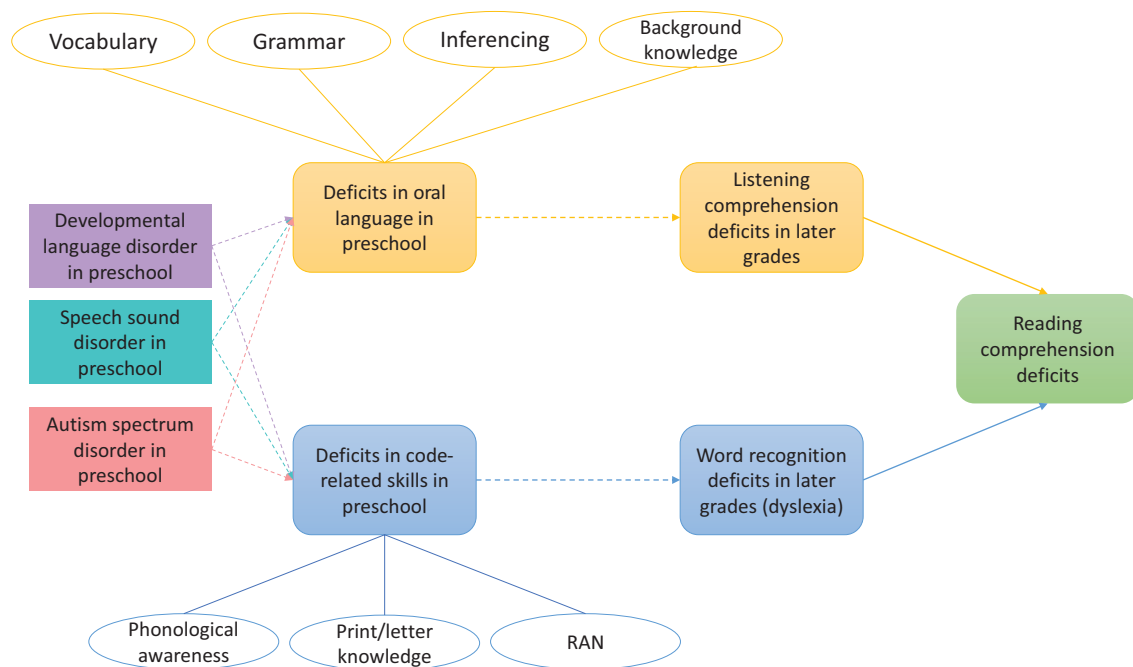
SLPs' Key Contributions to the Science of Reading: Language Comprehension

Although word reading instruction has improved in the U.S. over the past decade, reading comprehension scores have remained stagnant. Why? One key factor is the lack of systematic, high quality, evidence-based language comprehension instruction. If only one of the two components of reading comprehension—word reading—is explicitly taught in elementary school, then it is not surprising that reading comprehension scores are not improving over time. Moreover, the Simple View of Reading portrays the two sides (word reading and language comprehension) as if they are equal parts, when, in fact, language comprehension is more complex, has a more protracted and extensive development across the lifespan, and explains the majority of individual differences in reading comprehension for most of schooling after 3rd grade when compared to word reading. Unfortunately, even when curricula target language comprehension, they are often limited to testing comprehension instead of teaching comprehension, are not explicit and systematic, and take a backseat to content-focused instruction, especially in the later grades.

A primary focus of SLP research is to test ways to improve assessments of language comprehension and interventions to stimulate language skills that underpin language comprehension. SLPs test and target language

Figure 3

Preschool Risk Factors of Later Language Comprehension Deficits and Later Word Recognition Deficits That Contribute to Reading Comprehension Problems



Notes: Dotted lines indicate risk; Shared with permission from International Dyslexia Association from Komesidou & Hogan (2020).

comprehension not only because it's important for reading comprehension, but because it is also critically important for understanding everyday communication that children hear all around them. Language comprehension involves accurately following verbal directions, comprehending stories told by peers, and participating in conversations.

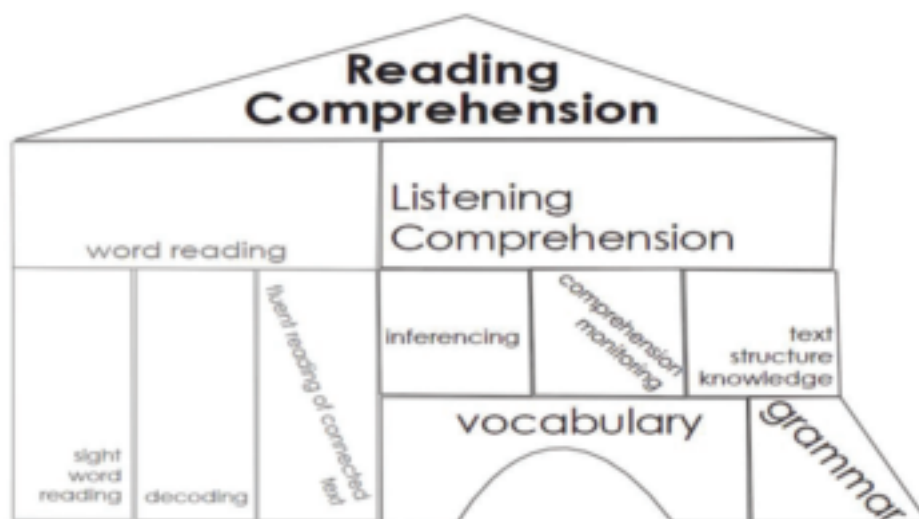
In terms of assessment, one barrier to accurately determining a child's language comprehension is the influence of language complexity and background knowledge on tests of comprehension (Catts, 2022). Tests have to account for these variables in order to accurately assess and monitor a child's language comprehension. For decades, SLP-led research has focused on creating more accurate and less biased tests of language comprehension. An example is the federally funded creation of the CUBED assessment, which is freely available online (https://www.languagedynamicsgroup.com/cubed/cubed_download/). The CUBED includes research-validated, reliable, and accurate tests of language and reading comprehension and word reading that are equated to monitor progress over time in children from pre-K to 3rd grade who are either primary English speakers or bilingual Spanish-English speakers (Petersen et al., 2018). What does it mean to be *equated*?

Stories are matched on a multitude of language aspects including story grammar, number of words, basic knowledge, and even the number of times characters are mentioned. This equating allows for progress monitoring of language comprehension over a school year with forms for use in the fall, winter, and spring. It is imperative to continue to develop similar types of measures to monitor progress in language skills and language comprehension.

In terms of intervention, SLP-led research focuses on best practices for stimulating language skills in children with DLD and other language comprehension deficits to improve both listening and reading comprehension (Hogan et al., 2011). For example, a team of SLPs funded by a special initiative, Reading for Understanding, developed and tested yearlong, Tier 1, full-classroom language curricula supplements for pre-K to 3rd grade students. The resulting language-focused, book-based 30 lessons called *Let's Know!* was a content area instructional curriculum that stimulated five malleable language components that underpin language and reading comprehension: vocabulary and grammar, and 3 higher level language skills, including story grammar knowledge, comprehension monitoring, and inferencing (see Figure 4).

Figure 4

The 5 Malleable Language Components of the Let's Know Tier 1 Classroom-Based Curriculum



Lessons were organized into 4 units—2 fiction (fiction and folktales) and 2 nonfiction (earth materials and animals)—that spanned one school year. A randomized control trial across 4 states showed that children who received the lessons and improved their language skills also improved in their language comprehension (LARRC et al., 2019). These lessons are available to freely download at <https://larrc.ehe.osu.edu/>. We are currently extending this work by testing the effectiveness of these lessons adapted for Tier 2 small group instruction in a randomized control trial (NIH R01 DC018823; Co-PIs: Hogan & Piasta) involving children who fail a language comprehension screener in 1st grade. Other examples of SLP-led work include improving vocabulary instruction, narrative language instruction, and the language basis of science instruction.

Future Directions for SLPs to Continue to Contribute to the Science of Reading

SLPs are often the first people to assess and treat children who will go on to have reading difficulties because of the connection between early speech and language abilities and later reading outcomes. SLPs have knowledge of language processes that underpin word reading and language comprehension as shown in Figure 1, and, as such, are valuable members of school-based literacy teams (Hogan, 2018). In this article, I have highlighted numerous contributions from SLPs to the science of reading. However, there is a critical need for translational science (Solari et al., 2020), which is the study of translating research to practice and of how practice informs research.

In the science of reading, translational efforts have primarily focused on the screening, assessment, and instruction of word reading. As a result of this and parent-led grassroots efforts resulting in the organization Decoding Dyslexia, a complementary focus has been on early identification of dyslexia in schools (Catts & Hogan, 2021). Our team, amongst others, is working with school partners to better address the barriers and facilitators to best practices for the language comprehension side of the Simple View of Reading within MTSS frameworks. We address both assessment (screening, progressing monitoring, comprehension individualized battery) and instruction (Tier 1 classroom instruction, Tier 2 small group instruction, and Tier 3 individualized instruction; Alonzo et al., 2022).

As it stands, children with poor language comprehension, including children with DLD, are not identified by most early reading screening batteries. In fact, only 20% of children with DLD are identified for support services in schools. Sadly, this has been the case since first documented in the mid-1990s (Tomblin et al., 1997). This under-identification is the result of several barriers, including a lack of routine screening and progress monitoring for language comprehension, no consistent label for DLD, and high caseloads that often preclude SLPs from serving on school-based literacy teams (Komesidou et al., 2022).

Currently, limited assessments of language comprehension are available for use in school-based MTSS frameworks. This is partly because the focus of instruction, and therefore assessment, is word reading in the early grades. Word

reading screening, progress monitoring, and assessment will happen to identify children who have DLD with poor word reading but will miss those with DLD who have good word reading abilities. Children with poor language comprehension tend to be identified in the later grades when measures of reading involve more comprehension processes—the often noted shift from “learning to read to reading to learn.” In fact, most late-emerging readers are actually late-identified readers (Catts et al, 2018); their language abilities were always poor but not identified until tests of reading included more complex texts that tax language abilities (Hogan et al., 2014; Petscher et al., 2018). Our school partners tell us that they rely on parents or teachers to report children’s difficulty with language comprehension. However, few know what to look for to identify DLD and language deficits. Instead, parents and teachers attribute their child’s DLD symptoms to traits such as laziness, inattentiveness, immaturity, or shyness.

Our school partners tell us that they rely on parents or teachers to report children’s difficulty with language comprehension. However, few know what to look for.

Surprisingly, the children with DLD identified for services aren’t those who have the most severe language impairment. Instead, those most likely to be identified are those with a more observable co-occurring condition (e.g., ADHD or speech sound disorder) or a parent with high income and/or education (i.e., socioeconomic status; Wittke & Spaulding, 2018). Our team has been developing and testing a group administered classroom screener for DLD in the early grades (see Komesidou et al., 2022). We also created an open access document listing current language screeners (<https://tinyurl.com/screen4DLD>). There are few language screeners available, and most do not meet rigorous standards; only one targets the identification of the growing population of English language learners, some of whom have DLD. In addition to a lack of screeners for DLD, as noted earlier, few progress monitoring assessments measure language comprehension, and comprehensive individualized assessment batteries often omit language evaluations (McGregor, 2020). Support cannot be provided to

those who need it if those who need it are not identified (Adlof & Hogan, 2019).

Another barrier to identification and support is the fact that there has historically been no consensus on a label for children with DLD. These children have been labeled in research as those with specific language impairment, expressive and receptive language disorder, or childhood aphasia, in the DSM-V (the authority on classification of disorders used by healthcare professionals) as language disorder, and under insurance as having an expressive and receptive language disorder. To make matters even more confusing, children with DLD qualify for IEP-based services under different categories, often changing according to age. From birth to 3, they qualify for services as having a developmental delay. In the early school years, they qualify for services as having a communication disorder or a speech and language impairment, depending on state-level guidance. In the later years, they qualify for services as having a specific learning disability: comprehension. Recent international efforts have focused on advocacy around one term: DLD (radld.org; dldandme.org). The U.S. system has been slow to adopt the term, partly because school-based SLPs have to focus on IDEA qualifying categories instead of on a diagnostic category.

Another barrier to assessment and intervention for those with DLD and poor comprehension is high caseloads for SLPs who then have limited time to participate in school-based literacy teams. As noted, SLPs treat a wide range of communication disorders. It is commonplace to have only one SLP in an elementary school assessing and treating all children with communication disorders, including those with autism, traumatic brain injury, intellectual disability, stuttering, and speech sound disorder. SLPs are the primary service provider for children with DLD, but these children have reading and academic struggles that need to be addressed by an interprofessional team in an MTSS framework. At this time, few schools have MTSS in place for language comprehension. It is imperative that children with DLD and others with poor comprehension are included in the MTSS system and, as such, are assessed and supported by an interprofessional team in a similar way that children with poor word reading are supported.

Under-identification and lack of school-based instructional support for children with DLD and others with poor comprehension has far reaching negative consequences. When these children do not receive support services, they are often drowning, and as a result, they

Under-identification and lack of school-based instructional support for children with DLD and others with poor comprehension has far reaching negative consequences.

are more likely to drop out of school, make less money over their lifetime, and have contact with the justice system (McGregor, 2020). It is clear that by only assessing the word reading side of the Simple View of Reading in the MTSS system, with limited attention to the language comprehension side, the opportunity gap will remain and keep reading scores stagnant. The under-identification and limited support of children with DLD, and more generally those who have poor language comprehension, is a social justice issue that SLPs, amongst others, are continuing to address in practice and research. ■

Author Note

Conflicts of interest: The authors declare that there are no competing interests at the time of publication. Correspondence concerning this article should be addressed to Tiffany Hogan, MGH Institute of Health Professions, 36 1st Avenue, Boston, MA 02129. Email: thogan@mghihp.edu. Note: This article was limited to 30 references due to space and readability. I acknowledge and thank the countless other unnamed SLPs who have contributed to the science of reading. Please contact me for a full list of references.

References

- Adlof, S. M. & Hogan, T. P. (2018). Understanding dyslexia in the context of developmental language disorders. *Language, Speech, and Hearing Services in Schools, 49*, 762-773.
- Adlof, S. M. & Hogan, T. P. (2019). If we don't look, we won't see: Measuring language development to inform literacy instruction. *Policy Insights from the Behavioral and Brain Sciences, 6*, 210-217.
- Alonzo, C. N., Komesidou, R., Wolter, J. A., Curran, M., Ricketts, J., & Hogan, T. P. (2022). Building sustainable models of research-practice partnerships within educational systems. *American Journal of Speech-Language Pathology, 1*-13.
- Aram, D. M., & Nation, J. E. (1980). Preschool language disorders and subsequent language and academic difficulties. *Journal of Communication Disorders, 13*(2), 159-170.
- Bloom, L., & Lahey, M. (1978). *Language development and language disorders*. Wiley & Sons.
- Catts, H. W. (1993). The relationship between speech-language impairments and reading disabilities. *Journal of Speech, Language, and Hearing Research, 36*(5), 948-958.
- Catts, H. W. (2022). Why state reading tests are poor benchmarks of student success. *The Reading League Journal, 3*(1), 15-23.
- Catts, H. W. & Hogan, T. P. (2021). Dyslexia: An ounce of prevention is better than a pound of diagnosis and treatment. *The Reading League Journal, 2*, 6-13.
- Catts, H. W. & Kamhi, A. G. (2012). *Language and Reading Disabilities, 3rd Edition*. Pearson.
- Catts, H. W., & Petscher, Y. (2022). A cumulative risk and resilience model of dyslexia. *Journal of Learning Disabilities, 55*(3), 171-184.
- Catts, H. W., Hogan, T. P., & Fey, M. E. (2003). Subgrouping poor readers on the basis of individual differences in reading-related abilities. *Journal of Learning Disabilities, 36*, 151-164.
- Catts, H. W., Fey, M. E., Zhang, X., & Tomblin, J. B. (2001). Estimating the risk of future reading difficulties in kindergarten children. *Language, Speech, Hearing Services in Schools, 32*, 38-50.
- Catts, H. W., Fey, M. E., Tomblin, J. B., & Zhang, X. (2002). A longitudinal investigation of reading outcomes in children with language impairments. *Journal of Speech, Language, and Hearing Research, 45*, 1142-1157.
- Catts, H.W., Adlof, S. M., Hogan, T.P., & Ellis-Weismer, S. (2005). Are specific language impairment and dyslexia distinct disorders? *Journal of Speech, Language, and Hearing Research, 48*, 1378-1396.
- Gough, P. B., & Tunmer, W. E. (1986). Decoding, reading, and reading disability. *Remedial and Special Education, 7*(1), 6-10.
- Hall, P. K., & Tomblin, J. B. (1978). A follow-up study of children with articulation and language disorders. *Journal of Speech and Hearing Disorders, 43*(2), 227-241.
- Hogan, T. P. (2018). Five ways speech-language pathologists can positively impact children with dyslexia. *Language, Speech, and Hearing Services in Schools, 49*, 902-905.
- Hogan, T. P., Adlof, S.M., & Alonzo, C. N. (2014). On the importance of listening comprehension. *International Journal of Speech-Language Pathology, 16*, 199-207.
- Hogan, T. P., Bridges, M. S., Justice, L. M., & Cain, K. (2011). Increasing higher-level language skills to improve reading comprehension. *Focus on Exceptional Children, 44*, 1-19.
- Komesidou, R. & Hogan, T. P. (2020). Preschool language precursors to later reading problems. *Perspectives on Language and Literacy, 46*, 37-41.
- Komesidou, R., Feller, M. J., Wolter, J. A., Ricketts, J., Rasner, M. G., Putman, C. A., & Hogan, T. P. (2022). Educators' perceptions of barriers and facilitators to the implementation of researcher-developed screeners for developmental language disorder and dyslexia. *Journal of Research in Reading*.
- Language and Reading Research Consortium (LARRC), Jiang, H., & Logan, J. (2019). Improving reading comprehension in the primary grades: Mediated effects of a language-focused classroom intervention. *Journal of Speech, Language, and Hearing Research, 62*, 2812-2828.
- Language and Reading Research Consortium (LARRC) and Chiu, Y. D. (2018). The Simple View of Reading across development: the prediction of grade 3 reading comprehension by pre-kindergarten skills. *Remedial and Special Education, 39*(5), 289-303.
- McGregor, K. K. (2020). How we fail children with developmental language disorder. *Language, Speech, and Hearing Services in Schools, 1*, 1-12.
- 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 Group, SIG 1 Language Learning and Education*, 5(1), 38-46.

Petersen, D. B., Gragg, S. L., & Spencer, T. D. (2018). Predicting reading problems 6 years into the future: Dynamic assessment reduces bias and increases classification accuracy. *Language, Speech, and Hearing Services in Schools*, 49(4), 875-888.

Petscher, Y., Justice, L. M., & Hogan, T. P. (2018). Modeling the early language trajectory of language development and its relation to poor reading comprehension. *Child Development*, 89(6), 2136-2156.

Richardson, S. O. (1992). Historical perspectives on dyslexia. *Journal of Learning Disabilities*, 25, 40-47.

Solari, E. J., Terry, N. P., Gaab, N., Hogan, T. P., Nelson, N. J., Pentimonti, J. M., Petscher, Y., & Sayko, S. G. (2020). Translational science: A roadmap for the science of reading. *Reading Research Quarterly*, 55, S347-S360.

Sun, L., & Wallach, G. P. (2014). Language disorders are learning disabilities: Challenges on the divergent and diverse paths to language learning disability. *Topics in Language Disorders*, 34(1), 25-38.

Tomblin, J. B., Records, N. L., Buckwalter, P., Zhang, X., Smith, E., & O'Brien, M. (1997). Prevalence of specific language impairment in kindergarten children. *Journal of Speech, Language, and Hearing Research*, 40(6), 1245-1260.



Tiffany P. Hogan

Tiffany P. Hogan, Ph.D., is a professor in the Department of Communication Sciences and Disorders at MGH Institute of Health Professions in Boston and a research associate at Harvard University. Dr. Hogan has published over 100 papers on the genetic, neurologic, and behavioral links between oral and written language development, with a focus on improving assessment and intervention for children with Developmental Language Disorder, Dyslexia, and/or Speech Sound Disorders. Her advocacy for children with reading difficulties has led her to co-found a DLD informational website: www.dldandme.org, host the SeeHearSpeak Podcast (www.seehearspeakpodcast.com), and contribute information for articles in numerous news outlets.





FULLY ONLINE READING SCIENCE PROGRAM

www.msj.edu/reading-science



DYSLEXIA CERTIFICATE

Meets the requirements for IDA-CERI
Structured Literacy/Dyslexia Specialist

MASTER OF ARTS DEGREE

Pathway to IDA-CERI Structured
Literacy/Dyslexia Interventionist

DOCTOR OF EDUCATION (Ed.D.)

Concentration in Reading Science
Fully online with summer institutes

Mount St. Joseph University is committed to providing an educational and employment environment free from discrimination or harassment on the basis of race, color, national origin, religion, sex, age, disability, sexual orientation, or other minority or protected status. Visit www.msj.edu/non-discrimination for the full policy and contact information. 02F-WO-001754/20/Ad