

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/262381400>

# On the importance of listening comprehension

Article in *International Journal of Speech-Language Pathology* · June 2014

DOI: 10.3109/17549507.2014.904441 · Source: PubMed

CITATIONS

8

READS

437

### 3 authors:



**Tiffany P Hogan**

MGH Institute for Health Professions

60 PUBLICATIONS 1,072 CITATIONS

SEE PROFILE



**Suzanne M Adlof**

University of South Carolina

21 PUBLICATIONS 996 CITATIONS

SEE PROFILE



**Crystle N Alonzo**

MGH Institute for Health Professions

3 PUBLICATIONS 10 CITATIONS

SEE PROFILE

Some of the authors of this publication are also working on these related projects:



Speech motor development [View project](#)



Word Learning in SLI, Dyslexia, and Typical Development [View project](#)

All content following this page was uploaded by [Tiffany P Hogan](#) on 02 November 2015.

The user has requested enhancement of the downloaded file. All in-text references [underlined in blue](#) are added to the original document and are linked to publications on ResearchGate, letting you access and read them immediately.

INVITED ARTICLE

## On the importance of listening comprehension

TIFFANY P. HOGAN<sup>1</sup>, SUZANNE M. ADLOF<sup>2</sup> & CRYSTLE N. ALONZO<sup>1</sup>

<sup>1</sup>MGH Institute of Health Professions, Communication Sciences and Disorders, Boston, MA, USA, and <sup>2</sup>University of South Carolina, Communication Sciences and Disorders, Columbia, SC, USA

### Abstract

The simple view of reading highlights the importance of two primary components which account for individual differences in reading comprehension across development: word recognition (i.e., decoding) and listening comprehension. While assessments and interventions for decoding have been the focus of pedagogy in the past several decades, the importance of listening comprehension has received less attention. This paper reviews evidence showing that listening comprehension becomes the dominating influence on reading comprehension starting even in the elementary grades. It also highlights a growing number of children who fail to develop adequate reading comprehension skills, primarily due to deficient listening comprehension skills (i.e., poor comprehenders). Finally we discuss key language influences on listening comprehension for consideration during assessment and treatment of reading disabilities.

**Keywords:** *Listening, comprehension, language, literacy, poor comprehender.*

### Introduction

In the popular television series *Mad Men*, 8-year-old Sally Draper reads to her grandfather from *The Decline and Fall of the Roman Empire*, “The warmth of the climate disposed the natives to the most intemperate enjoyment of tranquility and opulence, and the lively licentiousness—” When Sally cannot decode the word “licentiousness”, her grandfather provides it, and she continues—“of the Greeks was blended with the hereditary softness of the Syrians ...” (Waller, Weiner, & Getzinger 2009). Who is *reading*? Sally or her grandfather? To many, Sally is the one *reading* in this scenario because she is the one decoding printed text into spoken words (and even with appropriate prosody!). However, one might wonder how much of this complex text Sally is actually comprehending at her young age. If the ultimate goal of reading is to comprehend, has Sally accomplished it?

Consider another scenario. As a punishment for his constant mischief, a young boy is forced to learn to decode German texts, although he doesn’t speak or understand German. His grandfather understands German but cataracts prevent him from seeing printed words. The boy reads a letter to this grandfather from a German relative who chuckles often at his relative’s wit. Who is *reading*? The boy or his grandfather? As was the case with Sally, some may

argue that the boy is *reading* in this scenario because he is decoding printed text into spoken words. However, is the decoding of text into words useful if you can’t understand those words? If the ultimate goal of *reading* is to decode and comprehend written text, in this scenario neither the boy nor his grandfather is truly *reading*.

In 1986, Gough and Tunmer first introduced their “simple model” of reading. According to the simple view, shown in Figure 1, reading comprehension is the product of two primary factors: word recognition, or the ability to translate printed text into pronounceable words, and linguistic comprehension, the ability to understand text if it is heard instead of read. Over time, linguistic comprehension has been referred to as listening comprehension. These two components are necessary, but neither is sufficient, for reading comprehension to occur. Moreover, when text decoding skills are controlled, reading comprehension and listening comprehension should be equal.

After 28 years, the original simple view paper (Gough & Tunmer, 1986), cited in over a thousand subsequent publications, has been highly influential in informing frameworks of reading assessment and interventions. There is now a large body of studies showing that decoding and listening comprehension

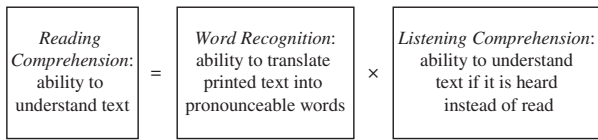


Figure 1. Simple view of reading (based on Gough & Tunmer, 1986).

are correlated, but separable skills, and that the two components of the simple view do an excellent job in explaining the individual differences observed in reading comprehension across the developmental span, from beginning readers through to adult readers (Adlof, Catts, & Little, 2006; Braze, Tabor, Shankweiler, & Mencl, 2007; Dreyer & Katz, 1992; Gough, Hoover, & Peterson, 1996; Hoover & Gough, 1990; Joshi & Aaron, 2000; Kendeou, van den Broek, White, & Lynch, 2009; Landi, 2010; San Chen & Vellutino, 1997). Much research has been conducted to understand the factors underlying difficulties in decoding, and there is now a large evidence base for providing good instruction in decoding and effective interventions for decoding difficulties (Gersten, Compton, Connor, Dimino, Santoro, Linan-Thompson, et al., 2008; National Reading Panel, 2000). In contrast, there has been relatively less attention to the importance of developing listening comprehension skills. Therefore, the field lacks specific recommendations about how best to assess development in listening comprehension or how to intervene when listening comprehension skills are not up to par. In this paper, we highlight the importance of listening comprehension to reading comprehension development, and we review evidence concerning a growing number of children, known as poor comprehenders, who fail to develop adequate reading comprehension skills, primarily due to poor listening comprehension. We conclude with recommendations for assessing key aspects of listening comprehension and a call for more research to identify effective treatments.

### Contribution of listening comprehension to reading comprehension increases over time

In the early grades, when learning to read is the focus of classroom instruction, reading comprehension is primarily constrained by decoding skills. The instructional texts children encounter in the early grades are often written below the level of their oral language comprehension. However, the simple view of reading predicts a change in the relative importance of decoding and listening comprehension over time. As decoding and word recognition become automatized, and as the texts children are exposed to become more linguistically complex, the influence of listening comprehension on reading comprehension should increase (cf. Gough et al., 1996). A recent meta-analysis provided convincing evidence that the influence of decoding skills on reading comprehension decreases across development

(Garcia & Cain, 2013), but few studies have examined relative changes in the influence of listening comprehension across grades.

A large scale, longitudinal study of over 500 children provides convincing empirical evidence of the increasing influence of listening comprehension on reading comprehension across development. Catts, Hogan, and Adlof (2005) used hierarchical regression to examine the unique and shared contributions of word recognition and listening comprehension to reading comprehension in second, fourth, and eighth grades. The constructs of word recognition, listening comprehension, and reading comprehension were each assessed using multiple measures with strong psychometric properties at each grade. Together, word recognition and listening comprehension measures accounted for the majority of the variance in reading comprehension across all grades, but the size of their unique contributions changed. The unique variance explained by word recognition decreased from 27% in second grade, to 13% in fourth grade, and only 2% in eighth grade. In contrast, the unique variance explained by listening comprehension increased from 9% in second grade, to 21% in fourth grade, and 36% in eighth grade (see Figure 2). A later study using the same longitudinal data examined word recognition accuracy, word recognition speed, listening comprehension, and reading comprehension as latent factors in a structural equation model, and found that by eighth grade listening comprehension and reading comprehension formed a unitary construct (Adlof et al., 2006). In other words, by eighth grade *all* of the reliable variance in reading comprehension could be explained by the listening comprehension factor.

### Prevalence of poor comprehenders increases across grades

According to the simple view, there are at least three possible subgroups of children who would display poor reading comprehension. One subgroup, who may be described as fitting a classic “dyslexic” profile, shows poor decoding skills but good listening comprehension skills. In this group, reading comprehension problems derive from difficulty decoding text. Another subgroup includes individuals who experience reading comprehension problems in spite of adequate word reading abilities. As predicted by the simple view, these individuals, referred to as “poor comprehenders”, also display lower levels of listening comprehension skills. The third group, who Gough and Tunmer (1986) referred to as “garden variety” poor readers, display deficits in both decoding and listening comprehension. These children have also been referred to as those with language learning disability (Catts et al., 2005).

Research into the identification of children with deficient reading comprehension has most often

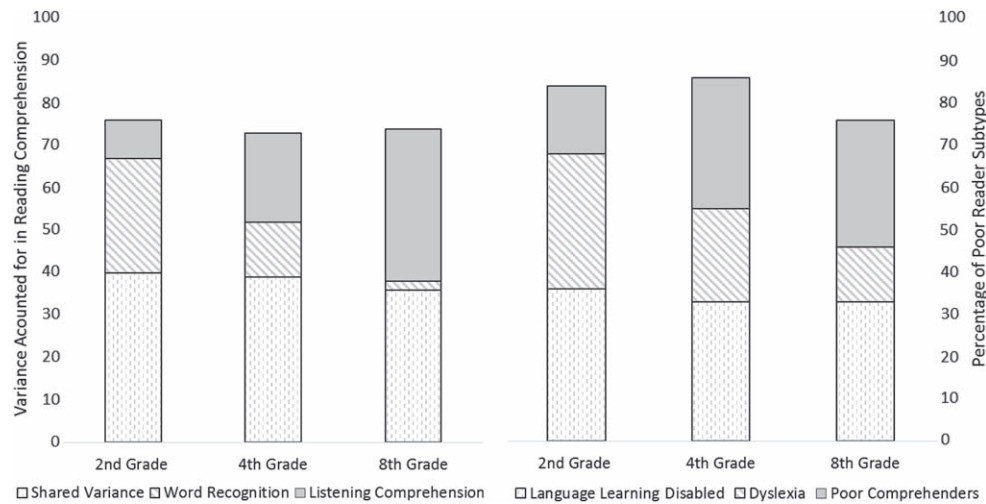


Figure 2. The changing nature of reading comprehension and poor reader sub-groups over time. Graphs show the percentage of variance accounted for by word recognition, listening comprehension, and the shared variance of the two to explain reading comprehension, alongside the percentage of each poor reader subtype across 2<sup>nd</sup>, 4<sup>th</sup>, and 8<sup>th</sup> grades (based on data from [Catts et al., 2005](#)).

focused on children with word recognition difficulties, including those with dyslexia as well as language learning disabilities. There is now a solid evidence base that word recognition problems can be linked to weakness in the phonological domain of language, and those weaknesses can often be identified in the pre-school years, or as soon as a child begins having difficulty learning to read ([Catts, Fey, Zhang, & Tomblin, 2001](#); [Gersten et al., 2008](#)). However, more recently, researchers have begun to more closely examine poor comprehenders, who display significant reading comprehension difficulties in spite of adequate word reading abilities ([Catts, Adlof, & Ellis Weismer, 2006](#); [Nation, Clarke Marshall, & Durand, 2004](#)). Unlike their peers with poor word recognition, poor comprehenders show intact phonological processing ([Cain, Oakhill, & Bryant, 2000](#); [Nation et al., 2004](#); [Stothard & Hulme, 1996](#)) with weaknesses in the language areas of semantics and syntax ([Catts et al., 2006](#); [Nation & Snowling, 1998](#); [Nation, Snowling, & Clarke, 2007](#)), as well as complex higher-level aspects of language such as idioms, inferencing, comprehension monitoring, and knowledge of text structure ([Cain, 2003](#); [Cain & Towse, 2008](#); [Cain, Oakhill, & Bryant, 2004](#)).

Because the definition of a poor comprehender requires that they have adequate word reading skills, many poor comprehenders are not identified as having a reading comprehension deficit until the later primary grades; their identification coincides with the oft-noted shift from “learning to read” to “reading to learn” ([Chall, 1967](#)). For example, estimates from a longitudinal sample in the US suggest that the prevalence rate of poor comprehenders increases across the school grades. [Catts et al. \(2005\)](#) reported that, among all children identified as having a reading comprehension problem, the proportion of those who were poor comprehenders increased from 16% in second grade to 30% in fourth grade. Sub-group stability remained steady at that point,

with 30% of all poor readers in eighth grade identified as being poor comprehenders ([Catts et al., 2005](#)). Data from the same study indicated that, within the general population, poor comprehenders comprised 3% of the full sample in second grade, 6% in fourth grade, 7.8% in eighth grade, and 9.6% in tenth grade ([Adlof & Catts, 2007](#)).

Until recently, the prevailing view has been that poor comprehenders’ language skills are on par with their typically-developing peers until they begin reading more complex words in longer, more difficult texts. However, recent longitudinal studies have revealed that many poor comprehenders present with poor oral language skills at the onset of—and sometimes prior to—formal schooling ([Catts et al., 2006](#); [Elwer, Keenan, Olson, Byrne, & Samuelsson, 2013](#); [Nation, Cocksey, Taylor, & Bishop, 2010](#)). In fact, one study reported that poor comprehenders identified in fifth grade had weak language skills as early as 15 months old ([Justice, Mashburn, & Petscher, 2013](#)) compared to their age-matched peers who went on to become good comprehenders and poor word readers (i.e., those with dyslexia). Even though some poor comprehenders are identified as clinically language impaired prior to or just beginning formal education ([Catts, Fey, Tomblin, & Zhang, 2002](#)), many of them present with deficits at sub-clinical or low-average levels during a time when they are showing an aptitude for learning to decode words. These “hidden language impairments” ([Nation et al., 2004](#)) then become more apparent when the child is faced with more complex academic texts which tax their linguistic systems.

It is hypothesized that the increase in prevalence of poor comprehenders is related to the changing nature of reading comprehension and in particular reading comprehension assessments. In the early grades, the texts used to assess reading comprehension and follow-up comprehension questions demand



less from one's language system, which allows those with weak language skills to read simple texts and answer basic comprehension questions as accurately as their typically-developing peers (Catts et al., 2005). In the later grades, reading comprehension assessments contain more difficult texts that require more complex language skills. Figure 2 highlights the link between the prevalence of poor readers subgroups and the changing nature of reading comprehension. Note the change in the percentage of children with dyslexia mirrors the change in the amount of variance accounted for by word recognition to reading comprehension, and the same is true for poor comprehenders and listening comprehension over time.

### Language basis of listening comprehension

To this point, we have described listening comprehension in very broad terms. Based on the simple view, listening comprehension refers to the ability to understand text read aloud. But what does that entail? Good listening comprehension first involves building an understanding of individual words and sentences in a story. However, good comprehenders go beyond single word and sentence comprehension to construct a *mental model* (Kintsch & Kintsch, 2005) that integrates a story's multiple propositions (e.g., story elements, sentences) and prior knowledge into a cohesive whole. Listening comprehension draws on the same language processes used to comprehend language via text, but it is free of the cognitive demands of having to decode text. In this way, listening comprehension can be conceptualized more broadly as one's ability to understand what one hears, not only in the service of reading comprehension, but for other purposes such as understanding a story told at the dinner table or building a mental model while watching a cartoon on television (Kendeou, Lynch, van den Broek, Espin, White, & Kremer, 2005). These "listening" skills have been developing since birth (and perhaps *in utero*, see DeCasper & Spence, 1986), well before formal reading instruction begins. In this section we describe a few key language influences on listening comprehension, including vocabulary, inferencing, and background knowledge. It should be noted that other factors, such as working memory (Daneman & Merikle, 1996) and attention (Lorch, Milich, Sanchez, van den Brock, Baer, Hooks, et al., 2000), impact listening comprehension; however, the coverage of those factors is out of the scope of this paper.

#### Vocabulary

To understand a text, the reader must understand the words it contains (recall the example of Sally Draper in our introduction). Accordingly, measures of vocabulary consistently emerge as strong predic-

tors of listening and reading comprehension across the developmental span, even after decoding skills are controlled (Braze et al., 2007; Cromley & Azevedo, 2007; Muter, Hulme, Snowling, & Stevenson, 2004; Storch & Whitehurst, 2002). Intervention studies provide more compelling direct evidence of the causal contribution of vocabulary knowledge to comprehension skill. In a meta-analysis of 37 vocabulary intervention studies, Elleman, Lindo, Morphy, and Compton (2009) found substantial effects when comprehension was measured using researcher-designed measures, which often included words targeted during the intervention, and more modest gains when comprehension was measured using published, norm-referenced measures. Interestingly, the effects of vocabulary instruction on comprehension were much larger for children with reading difficulties than for children without reading difficulties.

The importance of vocabulary knowledge to comprehension may seem obvious, but the precision and flexibility of word knowledge, i.e., the "lexical quality" (Perfetti, 2007), required for efficiently building a rich mental model, is often overlooked. Consider this example akin to what a child may experience in the classroom. This passage is quoted from an expository text, *Life in a Coral Reef* (Pfeffer, 2009, p. 5) for children aged 5–9 (per the publisher).

As morning sunbeams stream down through clear blue-green water, a coral reef, built in limestone from tiny sea animals, becomes a magical place. A coral reef overflows with underwater life. More sea creatures find food and shelter in coral reefs than any other ocean habitat.

Why might a child have difficulty comprehending this passage? In addition to less familiar, more complex sentence structure, children may not know such content-specific words as "shelter" and "habitat", as well as the less frequent senses of general vocabulary, including the verb sense of "stream" and the figurative sense of "overflows". Even if children are able to recognize those less frequent senses in an off-line task such as a vocabulary test, they must be able to efficiently access those meanings during reading to build a rich mental model. If too many cognitive resources are spent accessing these meanings, comprehension will suffer and some readers may simply give up. Studies of poor comprehenders indicate that, in addition to knowing fewer words overall, they show weaker semantic processing of words that they do know (Landi & Perfetti, 2007; Nation & Snowling, 1999). It is clear from this example that weak vocabulary may impede comprehension.

#### Inferencing

To create a mental model of a passage, one has to "fill in the gaps" left open in a story. Inferencing is the process of filling in these gaps to create a

cohesive mental model of a passage (Bowyer-Crane & Snowling, 2005). For example, a child may overhear his teacher telling another teacher that there was a banana peel on the floor, one of his classmates broke his glass, and now he has a bloody foot. Although it's not explicitly stated, the young listener may infer that his classmate slipped on the slick banana peel, broke a glass during his fall, and cut his foot on the broken glass. He built this mental model by filling in the gaps of the story fragments that he overheard.

Consider the following example from Sanford and Garrod (1981, p. 132), in which the reader is invited to draw inferences about the character "John":

John was on his way to school. He was terribly worried about the mathematics lesson.

Who is "John" in this story? Based on scant information, you may begin to build a mental model that John is a student worried about his math skills. We begin to make inferences about the direction of the story and about John as a character in this story, based on our assumption that John is a student. The next sentence in the story makes us rethink this inference.

He thought he might not be able to control the class again today.

Considering this new information, who is John? We may shift our mental model to include John as a teacher on his way to teach a tough lesson. Now we read:

He thought it was unfair of the instructor to make him supervise the class for a second time.

Now, who is John? As we learn new information we begin to infer that John may be a student teacher with little teaching experience, who may be supervised by a neglectful mentor. As we read the last sentence of the story, we learn who John really is.

After all, it was not a normal part of the janitor's duties.

Now who is John? He is the janitor. A surprise since it doesn't fit readily within the mental model we had created based on our inferences.

Within the discourse processing literature, many different types of inferences are recognized, including local inferences about pronoun antecedents, inferences that bridge gaps in text, forward predicting and elaborative inferences, and others (e.g., Graesser, Singer, & Trabasso, 1994). Research suggests that skilled readers efficiently integrate text elements to draw the first two types of inferences, but they rarely make forward predicting and elaborative inferences unless they are explicitly called upon to do so (as we just did in the example about John; Graesser et al., 1994; McKoon & Ratcliff, 1992). There is much evidence that poor comprehenders are less successful at drawing inferences than skilled comprehenders

(Bowyer-Crane & Snowling, 2005; Cain & Oakhill, 1999; Cain, Oakhill, Barnes, & Bryant, 2001). Although further study is needed, tentative evidence suggests that group differences between skilled and poor comprehenders are largest for elaborative inferences (Bowyer-Crane & Snowling, 2005). Interestingly, although it is acknowledged that drawing an inference requires applying background knowledge, evidence suggests that, even when that background knowledge is available, good comprehenders make a greater number of correct inferences than poor comprehenders (Cain et al., 2001), leading to more cohesive mental models.

#### *Background knowledge*

Thoreau (1906) noted, "We hear and apprehend only what we already half know". Building a rich mental model when listening or reading a passage requires the integration of new information with our prior knowledge. This integration has been described as a transaction between a passage and our personal and world knowledge, as well as the passage and other passages we have heard or read (Rosenblatt, 1985). Even if one knows all vocabulary words in a passage, a lack of background knowledge can be detrimental to comprehension. Take the following passage for example:

Sally first let loose a team of gophers. The plan backfired when a dog chased them away. She then threw a party but the guests failed to bring their motorcycles. Furthermore, her stereo system was not loud enough. Obscene phone calls gave her some hope until the number was changed. It was the installation of the blinking neon lights across the street that finally did the trick. Sally framed the ad from the classified section and now has it hanging on her wall.

It is likely that, although you are familiar with all of the vocabulary in this passage, you may have experienced comprehension difficulty. For example, could you correctly answer these comprehension questions?

1. Where did Sally put the gophers?
2. Why did Sally want the guests to bring their motorcycles?
3. What did the ad say?

Knowing the title, "Getting Rid of Bad Neighbors" (Haven, 2010) should now provide you the critical background knowledge you need to comprehend this passage.

Research has confirmed the positive association between background knowledge and text comprehension (Adams, Bell, & Perfetti, 1995). Unfortunately, many children, especially those from disadvantaged backgrounds, lack the basic background knowledge required for comprehending academic texts even if they "know" all of the vocabulary words contained in them (Burkam & Lee, 2002; Hirsch, 2003; Neuman, 2006). Whereas the background knowledge to comprehend our example passage could be provided by the title, the knowledge deficit

of poor comprehenders is potentially much worse when faced with academic text in content areas such as biology or history. Because background knowledge affects one's ability to make inferences as well as learn and store rich representations of vocabulary words, it can be considered fundamental to building a rich mental model for good listening comprehension.

### Variation in listening comprehension assessment

Tests designed to measure listening comprehension vary considerably in the degree to which they may be influenced by vocabulary, inferencing, and background knowledge, just as do tests designed to measure reading comprehension. A sense of this heterogeneity can be obtained by scanning the various standardized listening comprehension assessments described in Table I. A scan of this table suggests that listening comprehension is a complex construct dependent on numerous cognitive and linguistic processes.

In some assessments, a paragraph or more of text is read aloud, and students are asked to answer several comprehension questions. Some questions ask about literal information in the text; others require the reader to draw an inference by integrating textual information with their prior knowledge (e.g., Understanding Spoken Paragraphs sub-test of the *Clinical Evaluation of Language Fundamentals-4*). Other assessments test comprehension at a more local level (e.g., by beginning with sentence-picture matching tasks, e.g., "Point to the girl tying her shoe"). Sentences similar to this one appear in the beginning items of the Listening Comprehension sub-test of the *Woodcock Reading Mastery Test-III*. Over the next few test items, difficulty increases through longer passages, syntactically more complex sentences, and more difficult vocabulary. Later items, for children in the middle to upper grades, test understanding of brief paragraphs with a single open-ended question, assessing either literal understanding or inferential processes. Still another test, the *Listening Comprehension Test-2*, presents brief passages of three-to-four sentences, and asks students to answer questions of four types for each passage: main idea, details, reasoning, and vocabulary. It is unclear whether the same children will be identified as having poor listening comprehension based on different assessment scores, similar to the case of reading comprehension (Keenan, Betjemann, & Olson, 2008). However, recent evidence suggests that, at least in pre-schoolers, comprehension of texts read aloud draws on additional cognitive resources not necessarily required for comprehension of single sentences (Florit, Roch, & Levorato, 2013). In sum, listening comprehension is a complex construct, culminating from numerous linguistic and cognitive processes, which appears to be tested in different ways across different assessments.

### Interventions to improve listening comprehension

Listening comprehension skills can be stimulated across a child's educational career—pre-school through high school (and beyond). Children use these skills daily to follow sets of instructions, understand spoken stories, and converse about everyday activities. Although a large evidence-base shows how to effectively teach word reading (National Reading Panel, 2000), the same cannot be said for listening comprehension. A recent IES practice guide on improving reading comprehension skills in primary grades (Shanahan, Callison, Carriere, Duke, Pearson, Schatschneider, et al., 2010) provides only one recommendation for which there is "strong" evidence: teaching reading comprehension strategies, including activating prior knowledge, questioning, monitoring comprehension, visualization, drawing inferences, and retelling (evidence for each of these individual strategies varied). Moderate evidence supports the effectiveness of teaching organizational text structures and providing motivational contexts for teaching reading comprehension. Minimal evidence supports the effectiveness of purposeful text selection and of engaging in high quality text discussions.

There has been some significant progress towards knowing how to strengthen vocabulary (e.g., Nelson & Stage, 2007); however, because the vocabulary gap between good and poor comprehenders grows over time (Cain & Oakhill, 2011), vocabulary instruction alone is likely to be insufficient for making substantial, sustained improvements in listening and reading comprehension. The "Getting Rid of Bad Neighbours" passage highlights the importance of additional prior knowledge to comprehend a passage beyond vocabulary knowledge. No intervention studies have tackled how to improve background knowledge for the purposes of improving reading comprehension. While some of the discourse-level comprehension strategies, such as retelling and inferences, could be used to address aspects of listening comprehension (Hogan, Sittner, Justice, & Cain 2011), there is a clear gap in the evidence base for treating basic language deficits to improve listening comprehension, and, in turn, to increase reading comprehension.

### Conclusions

The simple view of reading decomposes the complex act of reading into two primary components: word recognition and listening comprehension. Sub-groups of poor readers are revealed by considering strengths and weaknesses in these key components. Poor comprehenders are a sub-group of children with adequate word recognition and weak listening comprehension. Over time the contribution of listening comprehension to reading comprehension increases and as such the incidence of poor comprehenders

Table I. Examples of standardized tests of listening comprehension for use with children.

Assessment name	Relevant sub-test(s)/domain(s)	Reference	Age range	Language	Norm- or criterion- referenced
Assessment of Literacy and Language (ALL)	1. Listening Comprehension	Lombardino, Lieberman, and Brown (2005)	Pre-school-Grade 1	English	Norm- & Criterion-referenced
Clinical Evaluation of Language Fundamentals-Pre-school-Second Edition (CELF-P2)	1. Recalling Sentences in Context	Semel, Wiig, and Secord (2004)	3;0-6;11 years old	English/Spanish	Norm-referenced
The Oral Language Acquisition Inventory-Second Edition (OLAI-2)	PK-G3: 1. Repeated Sentences 2. Story Retelling & Comprehension G4-G6: 1. Repeated Sentences	Gentile (2011)	PreK-Grade 6	English/Spanish	Criterion-referenced
Clinical Evaluation of Language Fundamentals-Fifth Edition (CELF-5)	1. Understanding Spoken Paragraphs 2. Sentence Comprehension	Semel, Wiig, and Secord (2013)	5;0-21;11 years old	English/Spanish	Norm- & Criterion-referenced
Test of Language Competence-Expanded Edition (TLC-Expanded)	1. Listening Comprehension: Making Inferences	Wiig and Secord (1989)	Level 1: 5-9 years old Level 2: 10-18 years old	English	Norm-referenced
Comprehensive Assessment of Spoken Language (CASL)	1. Paragraph Comprehension 2. Sentence Comprehension 3. Non-literal Language 4. Meaning from Context 5. Inference	Carrow-Woolfolk (1999)	3-21 years old	English	Norm-referenced
Preschool Language Scales-Fifth Edition (PLS-5)	1. Auditory Comprehension-Attention 2. Play 3. Semantics 4. Language Structure 5. Integrative Language Skills 6. Emergent Literacy Skills	Zimmerman, Steiner, and Pond (2011/2012)	Birth-7;11 years old	English/Spanish	Norm- & Criterion-referenced
Diagnostic Evaluation of Language Variation-Criterion-Referenced (DELV-CR)	1. Syntax: Passives Comprehension 2. Semantics: Quantifier Comprehension	Seymour, Roesper, deVilliers, and deVilliers (2003)	4-9 years old	English	Criterion-referenced
OWLS-II Oral and Written Language Scales-Second Edition (OWLS-II)	1. Listening Comprehension	Carrow-Woolfolk (2011)	3;0-21;11 years old	English	Norm-referenced
Auditory Processing Abilities Test (APAT)	1. Content Memory 2. Passage Comprehension	Swain and Long (2004)	5-12 years old	English	Norm-referenced
Test of Auditory Processing Skills-Third Edition (TAPS-3)	1. Auditory Comprehension 2. Auditory Reasoning	Martin and Brownell (2005)	4;0-18;11 years old	English	Norm-referenced
Test of Narrative Language (TNL)	1. Narrative Comprehension 2. Oral Narration 3. Index of Narrative Language Ability	Gillam and Pearson (2004)	5;0-11;11 years old	English	Norm-referenced
The Listening Comprehension Test-Second Edition (LCT-2)	1. Main Idea 2. Details 3. Reasoning 4. Vocabulary 5. Understanding Messages	Huisingsh, Bowers, and Lo Giudice (2006)	6-11 years old	English	Norm-referenced
Test for Auditory Comprehension of Language-Third Edition (TACL-3)	1. Elaborated Phrases and Sentences	Carrow-Woolfolk (1998)	3;0-9;11 years old	English	Norm-referenced
Woodcock Reading Mastery Tests-Third Edition (WRMT-3)	1. Listening Comprehension	Woodcock (2011)	4;6-79;11 years old	English	Norm-referenced



also increases across the grades. Listening comprehension is a complex skill involving many cognitive and linguistic processes which are tested in a variety of ways depending on individual comprehension assessments. Language influences on listening comprehension include vocabulary, background knowledge, and inferencing, among others. More work is needed to determine the most effective interventions to improve and sustain gains in listening comprehension.

### Acknowledgements

The first author's research is partially supported by grant # R305F100002 of the Institute of Education Sciences and grant # R01DC010784 of the National Institutes of Health. The views presented in this work do not represent those of the federal government, nor do they endorse any products or findings presented herein. Drs. Hogan and Adlof thank their academic mentor, Hugh Catts, for helpful discussions around the topics in this publication.

### References

- Adams, B. C., Bell, L. C., & Perfetti, C. A. (1995). A trading relationship between reading skill and domain knowledge in children's text comprehension. *Discourse Processes, 20*, 307–323.
- Adlof, S. M., & Catts, H. W. (2007). *Classification of children with poor reading comprehension*. Paper presented at the annual convention of the American Speech-Language-Hearing Association, Boston, MA.
- Adlof, S. M., Catts, H. W., & Little, T. D. (2006). Should the simple view of reading include a fluency component? *Reading and Writing, 19*, 933–958.
- Bowyer-Crane, C., & Snowling, M. J. (2005). Assessing children's inference generation: what do tests of reading comprehension measure? *The British Journal of Educational Psychology, 75*, 189–201.
- Braze, D., Tabor, W., Shankweiler, D. P., & Mencl, W. E. (2007). Speaking up for vocabulary reading skill differences in young adults. *Journal of Learning Disabilities, 40*, 226–243.
- Burkam, D. T., & Lee, V. E. (2002). *Inequality at the starting gate: Social background differences in achievement as children begin school*. Washington, DC: Economic Policy Institute.
- Cain, K. (2003). Text comprehension and its relation to coherence and cohesion in children's fictional narratives. *British Journal of Developmental Psychology, 21*, 335–351.
- Cain, K., & Oakhill, J. V. (1999). Inference making ability and its relation to comprehension failure in young children. *Reading and Writing, 11*, 489–503.
- Cain, K., & Oakhill, J. V. (2011). Matthew effects in young readers reading comprehension and reading experience aid vocabulary development. *Journal of Learning Disabilities, 44*, 431–443.
- Cain, K., Oakhill, J. V., Barnes, M. A., & Bryant, P. E. (2001). Comprehension skill, inference-making ability, and their relation to knowledge. *Memory & Cognition, 29*, 850–859.
- Cain, K., Oakhill, J., & Bryant, P. (2000). Phonological skills and comprehension failure: A test of the phonological processing deficit hypothesis. *Reading and Writing: An Interdisciplinary Journal, 13*, 31–56.
- Cain, K., Oakhill, J., & Bryant, P. (2004). Children's reading comprehension ability: Concurrent prediction by working memory, verbal ability, and component skills. *Journal of Educational Psychology, 96*, 31–42.
- Cain, K., & Towse, A. S. (2008). To get hold of the wrong end of the stick: reasons for poor idiom understanding in children with reading comprehension difficulties. *Journal of Speech, Language, and Hearing Research, 51*, 1538–1549.
- Carrow-Woolfolk, E. (1998). *Test of Auditory Comprehension of Language – Third Edition*. Austin, TX: Pro-ed.
- Carrow-Woolfolk, E. (1999). *Comprehensive Assessment of Spoken Language*. Torrance, CA: Western Psychological Services.
- Carrow-Woolfolk, E. (2011). *Oral and Written Language Scales – Second Edition*. Torrance, CA: Western Psychological Services.
- Catts, H. W., Adlof, S. M., & Ellis Weismer, S. (2006). Language deficits of poor comprehenders: A case for the simple view of reading. *Journal of Speech, Language, and Hearing Research, 49*, 278–293.
- 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.
- Catts, H. W., Fey, M. E., Zhang, X., & Tomblin, J. B. (2001). Estimating the risk of future reading difficulties in kindergarten children: a research-based model and its clinical implementation. *Language, Speech, and Hearing Services in Schools, 32*, 38–50.
- Catts, H. W., Hogan, T. P., & Adlof, S. M. (2005). Developmental changes in reading and reading disabilities. In H. W. Catts & A. G. Kamhi (Eds.), *The Connections Between Language and Reading Disabilities* (pp. 25–40). Mahwah, NJ: Lawrence Erlbaum Associates.
- Chall, J. S. (1967). *Learning to Read: The Great Debate*. New York: McGraw-Hill.
- Cromley, J. G., & Azevedo, R. (2007). Testing and refining the direct and inferential mediation model of reading comprehension. *Journal of Educational Psychology, 99*, 311.
- Daneman, M., & Merikle, P. M. (1996). Working memory and language comprehension: A meta-analysis. *Psychonomic Bulletin & Review, 3*, 422–433.
- DeCasper, A. J., & Spence, M. J. (1986). Prenatal maternal speech influences newborns' perception of speech sounds. *Infant Behavior and Development, 9*, 133–150.
- Dreyer, L. G. & Katz, L. (1992). An examination of the 'Simple View of Reading'. *Yearbook of the National Reading Conference, 41*, 169–176.
- Elleman, A. M., Lindo, E. J., Morphy, P., & Compton, D. L. (2009). The impact of vocabulary instruction on passage-level comprehension of school-age children: A meta-analysis. *Journal of Research on Educational Effectiveness, 2*, 1–44.
- Elwér, Á., Keenan, J. M., Olson, R. K., Byrne, B., & Samuelsson, S. (2013). Longitudinal stability and predictors of poor oral comprehenders and poor decoders. *Journal of Experimental Child Psychology, 115*, 497–516.
- Florit, E., Roch, M., & Levorato, M. C. (2013). The relationship between listening comprehension of text and sentences in preschoolers: Specific or mediated by lower and higher level components? *Applied Psycholinguistics, 34*, 395–415.
- García, J. R., & Cain, K. (2013). Decoding and reading comprehension: A meta-analysis to identify which reader and assessment characteristics influence the strength of the relationship in English. *Review of Educational Research, 84*, 74–111.
- Gentile, L. M. (2011). *The Oral Language Acquisition Inventory – Second Edition*. San Antonio, TX: Pearson.
- Gersten, R., Compton, D., Connor, C. M., Dimino, J., Santoro, L., Linan-Thompson, S., & Tilly, W. D. (2008). *Assisting students struggling with reading: Response to Intervention and multi-tier intervention for reading in the primary grades. A practice guide*. (NCEE 2009-4045). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. Retrieved from <http://ies.ed.gov/ncee/wwc/publications/practiceguides/>.
- Gillam, R. B., & Pearson, N. A. (2004). *Test of Narrative Language*. Austin, TX: Pro-ed.
- Gough, P. B., Hoover, W. A., & Peterson, C. L. (1996). Some observations on a simple view of reading. In C. Cornoldi &

- J. Oakhill (Eds.), *Reading comprehension difficulties: Processes and intervention*, (1–13), Mahwah, NJ: Lawrence Erlbaum Associates.
- Gough, P. B., & Tunmer, W. E. (1986). Decoding, reading, and reading disability. *Remedial and Special Education*, 7, 6–10.
- Graesser, A. C., Singer, M., & Trabasso, T. (1994). Constructing inferences during narrative text comprehension. *Psychological review*, 101, 371.
- Haven, K. (2010). Story proof: The science behind the power of story [PDF Document]. Retrieved from: [http://www.lib.noaa.gov/about/news/haven\\_09112010.pdf](http://www.lib.noaa.gov/about/news/haven_09112010.pdf)
- Hirsch, E. D. (2003). Reading comprehension requires knowledge - of words and the world. *American Educator*, 27, 10–13, 16–22, 28–29, 48.
- Hogan, T. P., Sittner, M. S., Justice, L. M., & Cain, K. (2011). Increasing higher-level language skills to improve reading comprehension. *Focus on Exceptional Children*, 44, 1–19.
- Hoover, W. A., & Gough, P. B. (1990). The simple view of reading. *Reading and Writing*, 2, 127–160.
- Huisinh, R., Bowers, L., & Lo Giudice, C. (2006). *The Listening Comprehension Test – Second Edition*. East Moline, IL: Linguistics.
- Joshi, R. M., & Aaron, P. G. (2000). The component model of reading: Simple view of reading made a little more complex. *Reading Psychology*, 21, 85–97.
- Justice, L., Mashburn, A., & Petscher, Y. (2013). Very early language skills of fifth-grade poor comprehenders. *Journal of Research in Reading*, 36, 172–185.
- Keenan, J. M., Betjemann, R. S., & Olson, R. K. (2008). Reading comprehension tests vary in the skills they assess: Differential dependence on decoding and oral comprehension. *Scientific Studies of Reading*, 12, 281–300.
- Kendeou, P., Lynch, J. S., van den Broek, P., Espin, C. A., White, M. J., & Kremer, K. E. (2005). Developing successful readers: Building early comprehension skills through television viewing and listening. *Early Childhood Education Journal*, 33, 91–98.
- Kendeou, P., Van den Broek, P., White, M. J., & Lynch, J. S. (2009). Predicting reading comprehension in early elementary school: The independent contributions of oral language and decoding skills. *Journal of Educational Psychology*, 101, 765.
- Kintsch W., & Kintsch, E. (2005). Comprehension. In: S. G. Paris and S. A. Stahl (Eds.), *Current Issues in Reading Comprehension and Assessment* (pp. 71–92). Mahwah, NJ: Lawrence Erlbaum Associates.
- Landi, N. (2010). An examination of the relationship between reading comprehension, higher-level and lower-level reading sub-skills in adults. *Reading and Writing*, 23, 701–717.
- Landi, N., & Perfetti, C. A. (2007). An electrophysiological investigation of semantic and phonological processing in skilled and less-skilled comprehenders. *Brain and language*, 102, 30–45.
- Lombardino, L. J., Lieberman, R. J., & Brown, J. J. (2005). *Assessment of Literacy and Language*. San Antonio, TX: Pearson.
- Lorch, E. P., Milich, R., Sanchez, R. P., van den Brock, P., Baer, S., Hooks, K., et al. (2000). Comprehension of televised stories in boys with attention deficit hyperactivity disorder. *Journal of Abnormal Psychology*, 109, 321–330.
- Martin, N., & Brownell, R. (2005). *Test of Auditory Processing Skills – Third Edition*. Novato, CA: Academic Therapy Publications.
- McKoon, G., & Ratcliff, R. (1992). Inference during reading. *Psychological review*, 99, 440.
- Muter, V., Hulme, C., Snowling, M. J., & Stevenson, J. (2004). Phonemes, rimes, vocabulary, and grammatical skills as foundations of early reading development: evidence from a longitudinal study. *Developmental Psychology*, 40, 665.
- Nation, K., Clarke, P., Marshall, C. M., & Durand, M. (2004). Hidden language impairments in children: Parallels between poor reading comprehension and specific language impairment? *Journal of Speech, Language and Hearing Research*, 47, 199–211.
- Nation, K., Cocksey, J., Taylor, J. S. H., & Bishop, D. V. M. (2010). A longitudinal investigation of early reading and language skills in children with poor reading comprehension. *Journal of Child Psychology and Psychiatry*, 51, 1031–1039.
- Nation, K., Snowling, M. J., & Clarke, P. (2007). Dissecting the relationship between language skills and learning to read: Semantic and phonological contributions to new vocabulary learning in children with poor reading comprehension. *International Journal of Speech-Language Pathology*, 9, 131–139.
- Nation, K., & Snowling, M. J. (1999). Developmental differences in sensitivity to semantic relations among good and poor comprehenders: Evidence from semantic priming. *Cognition*, 70, B1–B13.
- National Reading Panel. (2000). *Report of the National Reading Panel: Teaching Children to Read*. Washington, DC: Author.
- Nelson, J. R., & Stage, S. A. (2007). Fostering the development of vocabulary knowledge and reading comprehension through contextually-based multiple meaning vocabulary instruction. *Education & Treatment of Children*, 30, 1–22.
- Neuman, S.B. (2006). The knowledge gap: Implications for early education. In D.K. Dickinson & S.B. Neuman (Eds.), *Handbook of early literacy research* (vol. 2, pp.29–40). New York, NY: Guilford.
- Perfetti, C. (2007). Reading ability: Lexical quality to comprehension. *Scientific studies of reading*, 11, 357–383.
- Pfeffer, W. (2009). *Life in a coral reef*. (p.5). New York, NY: Harper Collins.
- Rosenblatt, L. M. (1985). Viewpoints: Transaction versus interaction—A terminological rescue operation. *Research in the Teaching of English*, 19, 96–107.
- San Chen, R., & Vellutino, F. R. (1997). Prediction of reading ability: A cross-validation study of the simple view of reading. *Journal of Literacy Research*, 29, 1–24.
- Sanford, A. J., & Garrod, S. C. (1981). *Understanding Written Language*. New York: Wiley.
- Seymour, H., Roeper, T., & De Villiers, J. (2003). *Diagnostic evaluation of language variation—Criterion-Referenced*. San Antonio, TX: Pearson.
- Shanahan, T., Callison, K., Carriere, C., Duke, N. K., Pearson, P. D., Schatschneider, C., & Torgesen, J. (2010). Improving reading comprehension in kindergarten through 3rd grade: IES practice guide. NCEE 2010-4038. *What Works Clearinghouse*.
- Storch, S. A., & Whitehurst, G. J. (2002). Oral language and code-related precursors to reading: Evidence from a longitudinal structural model. *Developmental Psychology*, 38, 934.
- Stothard, S. E., & Hulme, C. (1996). A comparison of reading comprehension and decoding difficulties in children. *Reading Comprehension Difficulties: Processes and Intervention*, 93–112.
- Swain, D. R., & Long, N. (2004). *Auditory Processing Abilities Test*. Novato, CA: Academic Therapy Publications.
- Thoreau, H. D. (1906). In B. Torrey & F.B. Sanborn (Eds.), *The Writings of Henry David Thoreau*. Boston, MA: Houghton Mifflin.
- Waller, D., & Weiner, M. (Writers), & Getzinger, J. (Director). (2009). My old Kentucky home [Television series episode]. In S. Hornbacher (Producer), *Mad men*. Los Angeles, CA: Lionsgate Television.
- Wiig, E. H., & Secord, W. (1989). *Test of language competence – Expanded Edition*. San Antonio, TX: Pearson.
- Wiig, E. H., Secord, W., & Semel, E. M. (2004). *Clinical Evaluation of Language Fundamentals Preschool*. San Antonio, TX: Pearson.
- Wiig, E. H., Secord, W., & Semel, E. M. (2013). *Clinical Evaluation of Language Fundamentals – Fifth Edition*. San Antonio, TX: Pearson.
- Woodcock, R. W. (2011). *Woodcock Reading Mastery Tests – Third Edition*. San Antonio, TX: Pearson.
- Zimmerman, I. L., Steiner, V. G., & Pond, R. E. (2011/2012). *Preschool Language Scale – Fifth Edition*. San Antonio, TX: Pearson.