ONE

Introduction to Reading Assessment

THREE READERS: A PREFACE

Consider these three children:

> **Josh** is a third grader who has difficulty pronouncing unfamiliar words. Sometimes he makes guesses from their first letter and sometimes by attempting to sound them out from left to right. He does, however, know a fair number of words by sight, and whenever he encounters one of them, he can pronounce it immediately.
>
> **Latrelle** is a fourth grader who has acquired a good store of words that she recognizes at sight, and she can successfully pronounce almost any familiar word she encounters while reading. Her pace is slow, however, and her oral reading is expressionless. She does not group words into meaningful phrases as she reads, and she tends to ignore punctuation.
>
> **Dom**, a sixth grader, is a proficient oral reader who can read aloud just about anything he is given, but he often has problems comprehending new material. This difficulty is especially evident when he is asked to read informational texts in the content areas. He is a fair student when his teacher explains new content, but he has problems whenever he must learn it on his own from print.

These three children were each categorized as *Not Proficient* on their high-stakes state assessments. However, they each struggled with the test for different reasons, and they each need different instructional interventions. The children described above are composites of real cases and represent important profiles of reading difficulties that teachers must be prepared to identify and address. Although each of those children may bring valuable experiences and knowledge to the reading experience, without strong word reading, fluency, and comprehension skills, they have a difficult time learning from

texts and expressing what they know in writing. In an era where a renewed focus on the science of reading and evidence-based practice has shone a spotlight on effective reading instruction and reading achievement gaps, it is more important than ever that we get it right. Assessment is the first step in identifying and addressing the literacy needs of our developing readers. The second step is providing evidence-based reading instruction based on those identified needs.

THE SCIENCE OF READING AND THE NATIONAL READING PANEL REPORT: "FIVE PILLARS" OF READING INSTRUCTION

In recent years, the *science of reading* (SoR) has become a widespread term. The SoR refers to a large, comprehensive body of research accumulated over the last five decades from a variety of disciplines—including neuroscience, cognitive psychology, linguistics, and, in particular, educational studies of instructional efficacy—that explains:

- How the human brain learns to read
- Why some people struggle with learning to read
- Which approaches to reading instruction are most effective

In terms of the SoR's research on instructional effectiveness, the landmark report of the National Reading Panel (NRP, 2000) identified five essential components, or pillars, of effective reading instruction: phonemic awareness, phonics, fluency, vocabulary, and comprehension. Although over 20 years old, the NRP report is still widely referenced, and these five pillars have become part and parcel of most respected instructional approaches to reading. If these five components are *essential for instruction*, then it follows that they are also *essential for assessment.* That is why we devote an entire chapter in this book explaining how to assess each of these reading components, or "pillars":

- Phonemic awareness (Chapter 3, on emergent literacy)
- Phonics (Chapter 4, on orthographic knowledge)
- Fluency (Chapter 6)
- Vocabulary (Chapter 8)
- Comprehension (Chapter 9)

The Simple View of Reading and Scarborough's Reading Rope

When discussing the SoR, two related models of reading are nearly always referenced: the simple view of reading (SVR; Gough & Tunmer, 1986) and Scarborough's Reading Rope (Scarborough, 2001). Because they are so similar, and because we view Scarborough's Reading Rope as essentially a visual depiction and slight modification of the SVR, we will focus on the latter here.

As illustrated in Figure 1.1, Scarborough's Reading Rope conceptualizes skilled, proficient reading as a rope composed of two main strands: (1) language comprehension and (2) word recognition. Each of these two main strands is composed of smaller strands.

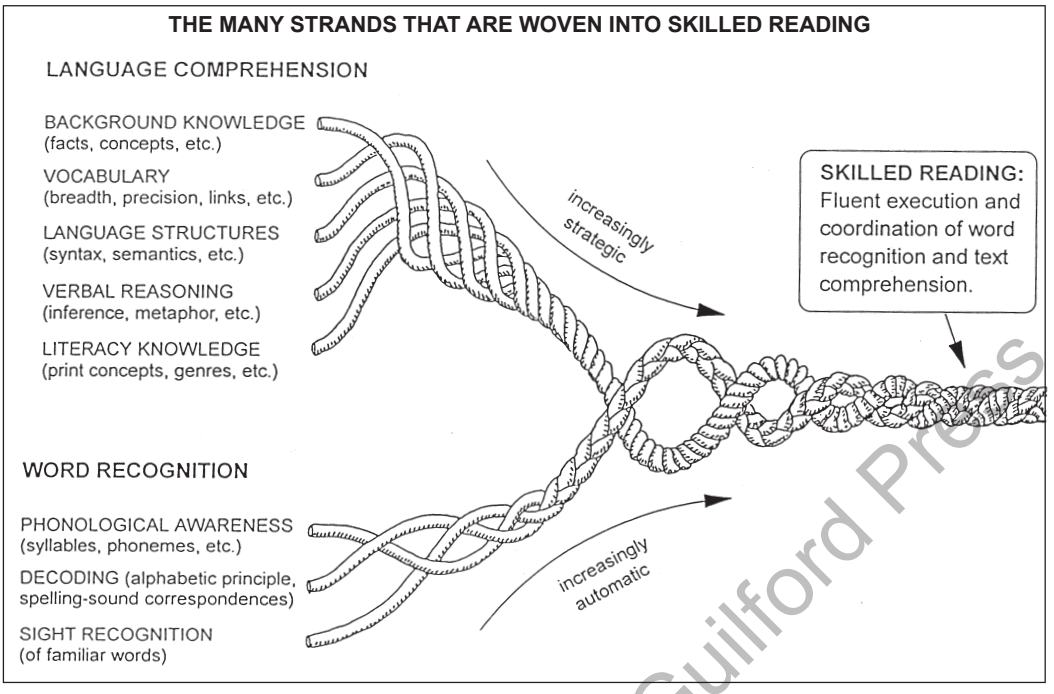

FIGURE 1.1. Scarborough's Reading Rope.

For example, the strand of word recognition is dependent on phonological awareness, decoding, and sight recognition. The stronger each strand becomes, and the more tightly woven to the other strands, the stronger the entire rope becomes. As word recognition develops, it becomes *increasingly automatic* for the reader. As language comprehension develops, readers become *increasingly strategic* in employing it. In this book, we explain how to assess many of the components of the Reading Rope, including vocabulary (Chapter 8), phonological awareness (Chapter 3), and decoding (Chapter 4).

The Active View of Reading

A relatively recent reading theory proposed by Duke and Cartwright (2021), the active view of reading, is an expansion of the SVR that adds to it in two important ways: (1) It conceptualizes components such as fluency, vocabulary knowledge, and morphology as "bridging processes" that influence *both* word recognition and language comprehension (as opposed to only influencing one of these two main "strands") and (2) it adds the essential component of a reader's "active self-regulation" skills, including *executive function skills* (e.g., working memory, attention, emotional control, planning), *motivation and engagement*, and *strategy use* as important contributors to proficient reading. This model's emphasis on these critical self-regulation skills is particularly important when assessing a reader and trying to pinpoint areas of challenge for intervention. In this book, we explain how to assess many of these critical "active self-regulations" skills described by Duke and Cartwright, including in Chapter 9 (comprehension) and Chapter 10 (affective factors, including reading purposes, attitudes, and interests).

How Reading Develops

The SVR, Scarborough's Rope, and the active view all conceptualize reading processes clearly but do not explain how it develops for children. Reading development is key to both instruction and assessment, as we need to understand what children already know and what they need to learn next. Several developmental models have been developed that explain different aspects of how children develop the skill of reading and writing over time.

First, Jeanne Chall (1996) proposed a theory that children progress through six stages as they move from emergent literacy, or the beginning period of becoming aware of print, to advanced literacy activity, such as that needed to assimilate material in a graduate course. Although Chall's model provides an excellent blueprint for overall reading development, it was not developed specifically to align with reading assessments or identify reader strengths and areas of difficulty.

Linnea Ehri (1998) proposed a model for how children in particular develop word recognition, moving from pre-alphabetic (not knowing any letters or sounds) to being automatic word readers who can read all of the words without sounding them out. Additionally, Bear, Invernizzi, Templeton, and Johnston (2020) describe how reading, writing, and spelling all develop with synchronicity strengthening the overall "braid of literacy" (Bear et al., 2020). Ehri and Bear and colleagues' theories of development provide more information that aligns with assessment.

For that purpose, we prefer using (1) Ehri's (1998) stage model of word recognition growth coupled with (2) Bear and colleagues' (2020) stages of reading, writing, and spelling development. Ehri's stages provide a roadmap for how children develop automaticity, while Bear and colleagues' developmental sequence provides specificity for what patterns and skills readers learn at each of those stages. Because these two developmental theories of reading development are particularly powerful when assessing word knowledge, we describe them in depth in Chapter 4 (see pp. 72–76 and Table 4.2).

THE COGNITIVE MODEL OF READING ASSESSMENT

All reading assessment is based on a model. This model can be explicitly laid out, as we intend to do here, or haphazardly formulated. Without a model, a teacher, reading specialist, or tutor has no way of making sense of the observations derived from a reading assessment battery. The model helps educators recognize patterns in the data, determine the course of instruction, identify a child's strengths, and identify which aspects of reading knowledge are creating hurdles for the child.

A model should provide a roadmap, a set of directions to help the teacher or reading specialist navigate the assessment procedure and provide guidelines for interpretation. Not every child needs to receive every assessment; in fact, we discourage overassessing children, a real problem that teachers face in our era of accountability. An effective model helps you determine which measures may best inform you about each child's needs.

The cognitive model of reading assessment suggests that reading consists of three separate components. Reading comprehension, the purpose of reading, depends on

(1) automatic recognition of the words in the text, (2) comprehension of the language in the text, and (3) the ability to use the strategies needed to achieve one's purpose in reading the text. A child will have difficulties with comprehension if he has difficulty with any of these three components. If a child's word recognition is not automatic or sufficiently accurate, then comprehension will suffer. If the child does not understand the vocabulary, lacks appropriate background knowledge, or lacks knowledge of text structure or genre, comprehension will suffer. Children read different texts for different purposes. Sometimes these purposes are general, such as enjoyment or literal comprehension. But sometimes the purposes are specific, such as studying for a test or learning facts to include in a report. If a child can read a text but does not engage in purposeful reading, then comprehension also will suffer. The aspects of the cognitive model align well with other ways of thinking about reading, including the SVR, Scarborough's Rope, and the active view.

This cognitive model, shown in Figure 1.2, is discussed in the sections that follow. We use this model systematically to ask ourselves, "Does the child have trouble with reading comprehension?" and, if so, prying into the "why" by asking questions such as "Does the child have difficulty with automatic word recognition?" The answers to these questions help us identify the areas of strength and instructional needs of the child; they provide guidance about instructional targets. We call this model *cognitive* simply because it includes only the cognitive, or "thinking," aspects of reading and not the affective dimensions (although we address them in Chapter 10). Using the model requires that *we* be cognitive as well! We must think systematically about these questions in order to reach justifiable inferences based on the answers.

The first question to ask is whether the child has difficulty comprehending texts. Often, teachers or reading specialists are told (by parents or other teachers) that a child

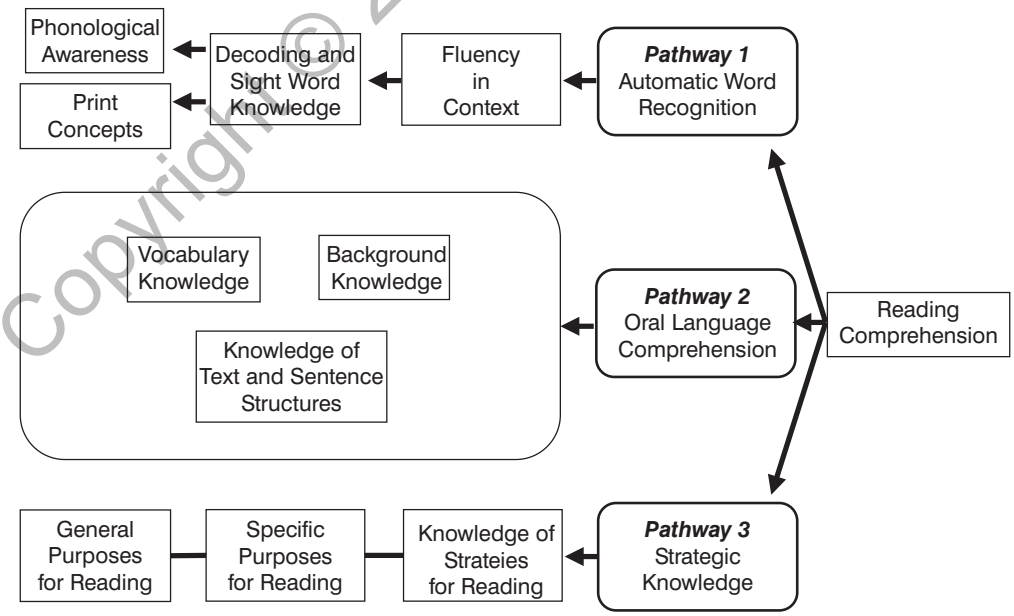

FIGURE 1.2. The cognitive model.

has problems with reading when, in fact, the child does not. Sometimes a child has behavioral–emotional issues that prohibit them from being able to demonstrate literacy skills consistently in a classroom setting. Sometimes a child does poorly on a standardized test, even when they are able to read grade-level material in the classroom without difficulty. Remember that a standardized test is just one observation, covering only 1 or 2 days, and is often conducted in Standard English, which may not be the dialect or language spoken in a child's home. Sometimes students simply have a hard time with testing or have difficulties on the day of that test. Students who come to school without breakfast or after witnessing an argument, or with some other problem, may not do as well on a standardized test as they might have. As we note in the next chapter, such tests should not be the only source of information about a student's performance in reading (or math or any other subject for that matter). Instead, multiple sources of information must be compiled before anyone can understand whether the child's reading performance is part of a consistent pattern. This compilation involves not only standardized test results, but also how the child reads the books used in the classroom, how well they know phonics patterns, and other information.

To determine whether a student has difficulty with reading, keep in mind that the purpose of reading is comprehension.

So, Step 1 in the assessment process is:

- Administer the universal literacy screening assessment used by your school to every student.
- If the student does not meet grade-level expectations on the universal screener, then administer follow-up diagnostic assessments, such as measures of decoding or fluency, and closely observe the student in class.
- If a student has a significant problem with comprehension of age-appropriate texts, then you should further examine the student's reading. Using our model, ask the following questions about the child:
  - Is the child able to read texts appropriate for their grade placement level using automatic word recognition and adequate expression?
  - Is the child able to comprehend the language of the text?
  - Does the child have adequate knowledge of the purposes for reading?
  - Does the child have strategies available to achieve those purposes?

These questions are explored in the remainder of this chapter.

COGNITIVE MODEL PATHWAY 1: AUTOMATIC WORD RECOGNITION

If a child struggles with word recognition (one-half of the SVR equation), comprehension will inevitably suffer (LaBerge & Samuels, 1974). Word recognition needs to be automatic so that the child does not have to devote conscious attention to the words in the text and can devote all of their cognitive effort to understanding what is read. When a child stumbles over words or sounds out many words, the child's understanding typically

suffers. Scarborough identifies three strands of the rope that influence automaticity: phonological awareness, decoding, and word recognition.

To answer the first question about automatic word recognition (Is the child able to read texts appropriate for their grade using automatic word recognition and adequate expression?), you must listen to the child read material intended for their grade level. This can be done by pulling the child aside and listening to them read from a selected text using holistic reading analysis processes as described in Chapter 5. If the child's reading is expressive and they can read texts appropriate for their grade, then you can reasonably conclude that the child's problem lies elsewhere. However, our clinical experience suggests that as many as 75% of the children we see have difficulties with automatic word reading. Sometimes the problems lie exclusively in this area; at other times, the child will have difficulties with language comprehension and strategic knowledge as well. But word-recognition difficulties underlie the vast majority of reading problems, so we spend a lot of time assessing them to determine what a child can do, as well as exactly where the process begins to deteriorate.

If a child is deemed to have difficulties in automatic word recognition, then the question that follows is this:

- Can the student read fluently in connected text?

Fluency in Context

Many children with reading problems can read accurately but cannot read quickly enough to make sense of what they are reading. By the time they get to the end of a long sentence, they may have forgotten what the sentence said. If reading is not fluent, then comprehension, including the ability to generate inferences, usually suffers.

You may be wondering, what does it mean to be fluent *in context*? Context simply refers to reading whole paragraphs as opposed to single words. Why do we need to even state this? Sometimes, if children are taught to rely excessively on sounding out words (something that may occur in isolated phonics programs), then they may lose sight of the importance of textual meaning, and reading becomes nothing more than a rote exercise. We do see children in our clinics who have been taught to focus on word reading in this manner. These children also tend to be significantly better at calling words than at comprehending text. The ultimate goal of reading is comprehension; thus, a focus of all instruction, including word-recognition instruction, needs to lead with the purpose of reading for meaning. Thus, we cannot fully understand children's reading without examining meaningful encounters with fluency *in context*.

Some people conflate the idea of assessing fluency in context with teaching students to guess at words based on the context. We do not suggest that readers use information from context to minimize the use of letter–sound information to recognize words. Although this idea of guessing based on the context or semantic clues may be intuitively appealing, *research does not support this as efficient reading behavior.* Effective readers would recognize the words more quickly and reliably than they would be able to predict the word through the use of syntactic and semantic information (Stanovich, 1991).

Research using a number of different approaches has found that good readers do not predict words but, instead, use their automatic word-recognition processes to propel reading (Adams, 1990, 1998; Rayner, Pollatsek, Ashby, & Clifton, 2012).

That said, we have found that good readers *do* use context in two principal ways, both of which we can and should observe during reading assessment. First, they use context to monitor their reading comprehension (Oakhill & Cain, 2012). A reader who produces *wagging* for *wagon* in the target sentence would realize that the word does not make sense and would go back and self-correct. Thus, a good reader's errors tend to make sense in context because of active monitoring, *not predicting*. This is particularly important in kindergarten and early first grade, when children are still in the partial cue-reading stage (Ehri, 1998) or the early letter-name stage (Bear et al., 2020). Prior to instruction in a variety of vowel patterns, children's reading of natural connected text will call for them to use context (or texts with consistent structures) until they know enough about how words work to engage in full alphabetic coding. However, in order to succeed with texts at a mid-first-grade reading level and beyond, students must utilize the alphabetic system (McGee, Kim, Nelson, & Fried, 2015).

Second, good readers also use context to rapidly select the intended meaning of multiple-meaning words. Consider this sentence:

The rancher hired a new hand.

The word *hand* has several meanings, but proficient readers have no trouble discerning the correct one. They do so *after* the word is located in memory, not before. That is to say, good readers use context not to predict the word, but to select the appropriate meaning once the word has been located.

Children who fail to acquire decoding skills in a normal developmental trajectory may continue to rely on context to help them identify words. As Stanovich (1980) puts it, they compensate for this deficit by using context to identify words. This relationship is illustrated in Figure 1.3: As decoding improves, reliance on context diminishes. When we evaluate children in our clinics, we find that usually 80% or more of their miscues are syntactically acceptable (i.e., are the same part of speech as the text word), and 70% or more are semantically acceptable (i.e., make sense in the context of the sentence, even if their meaning is not the same as the word in the text). When children do not use context effectively, either the text is extremely difficult for them and they make random guesses or they are not focused on context.

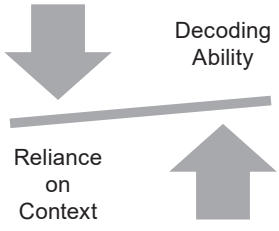

FIGURE 1.3. The relationship between context and word recognition.

Thus, if a child is poor at using context to monitor their comprehension of the text, we would look at the child's interview data to see how she perceives reading, and we would evaluate the child's comprehension of connected, authentic texts read orally to see whether they are focusing on comprehension during reading.

Because of the importance of contextual reading, we learn about a child's degree of fluency through analysis of oral reading. This can be done by observing the child read a trade book or by using texts designed for assessment, such as passages in the Dynamic Indicators of Basic Early Literacy Skills—Next (DIBELS Next), AIMSweb, or the Formative Assessment System for Teachers (FAST) assessment batteries. In Chapter 5, we address how to analyze readers' holistic reading; in Chapter 6, we include a rubric or scoring guide that can be used to decide whether reading is fluent. Generally, however, the criteria can be stated simply, as whether the child's reading sounds like language:

- Is the child's reading halting or smooth?
- Does the child stop to sound out words excessively?
- Does the child have to repeat phrases excessively or self-correct excessively?

If a child engages in halting reading, with excessive sounding out, repetition, or self-correction, then they may need work in fluency. If the child is not fluent or accurate at reading texts written at their grade placement level, then we need to ask two questions about the child's word recognition:

- Does the child have adequate sight-word knowledge?
- Does the child have adequate knowledge of decoding strategies?

Sight Words and Orthographic Mapping

The term *sight words* can be defined in two principal ways. Ehri (1998) uses *sight words* to refer to all the words that a child recognizes "at sight," or automatically. Under this definition, both common words, such as *the* and *what*, and uncommon words, such as *wolf* and *rescue*, might all be sight words for a given individual, with the goal being that all words are eventually read automatically. It is important to distinguish sight words from high-frequency words—that is, the words that occur most often in print. Obviously, high-frequency words are likely to become sight words for a beginning reader. But for assessment purposes, we use the term *high-frequency words*.

Adams (1990) points out that the 105 words that occur most frequently account for about 50% of running text. This is just as true for adult text as it is for children's text. While a number of these high-frequency words are irregular (e.g., *of*), many others are at least partially or entirely regular (e.g., the digraph *th-* in *the*, *this*, and *that*), and thus can be studied with commonly occurring patterns. Either way, these words need to be learned completely so that they can be retrieved quickly and automatically. Ehri (2013) coined the term *orthographic mapping* to refer to the process by which readers store sight words in memory. Because an understanding of how orthographic mapping works is essential for all literacy educators, we explain it in more depth in Chapter 4.

There are several lists of the most frequently used words in English, notably the lists developed by Dolch (1936) and Fry (1980). As one might expect, there is considerable overlap among lists. In addition, the words on any of these lists are worth assessing and teaching. We include both lists in Chapter 4. We recommend using one of these two lists as opposed to creating your own.

In assessing children's knowledge of high-frequency words, it is important to note both speed and accuracy. Because so many textual words are sight words, slow recognition entails slow text reading in general. Sounding out a word such as *with*, even if the child arrived at the correct pronunciation, would still impair comprehension, as would a halting pronunciation after a long pause. Therefore, the assessor should note both the accuracy and speed of recognition. Each word on a list should be recognized in roughly half a second or less—that is, without hesitation.

In addition, one should observe children's recognition of high-frequency words in context. Since these words account for such a large percentage of the words in any text, an analysis of oral reading provides ample opportunity to observe children's skills at recognizing high-frequency words in context. Again, these are words that should be recognized *automatically*, without hesitation or sounding out.

Phonics and Decoding

We are also interested in whether a child has the ability to decode unknown words. The ability to decode requires knowledge of the processes involved in decoding, as well as knowledge of specific letter–sound relationships (i.e., phonics), as the active view of reading points out (Duke & Cartwright, 2021). We need to assess both.

Assessing the Process of Decoding

As suggested by Ehri's (1998) model, the process of decoding involves three successive understandings: (1) acquisition of the alphabetic principle, (2) the ability to blend letter sounds into words, and (3) the ability to use both phonograms and analogies. Children's acquisition of the alphabetic principle—the principle that letters can be used to represent sounds—is revealed by their use of letters as cues for words in both word recognition and spelling. Spelling may be a better means of assessing children's knowledge of the alphabetic principle since children may use the first letter as a visual rather than a phonemic cue.

Letter-by-letter decoding—the ability to blend letters together to make words—is the hallmark of Ehri's (1998) full alphabetic coding phase and Bear and colleagues' (2020) letter-name stage. Although this phase is fairly short-lived, it is critical: Children need to appreciate individual letter–sound correspondences in order to move toward automatic word recognition. This ability can be evaluated by measures that tap children's knowledge of individual letter sounds as well as their decoding of short-vowel words. Because short vowels are usually the first vowel types taught first in most phonics curricula, we use short vowels as the test of children's blending ability.

Ehri's last stage, *consolidation*, involves being able to use both phonograms, or chunks of letters (e.g., *ick*, *ill*, *and*), and analogies (e.g., decoding *strike* by comparing

it with *like*). Proficient readers decode words using these strategies. Studies have found that children must be able to understand letter-by-letter decoding before they are able to benefit from analogy or phonogram instruction, but children need to use phonograms in order to read proficiently (e.g., Ehri & Robbins, 1992). Children are first able to use phonograms and analogies to decode monosyllabic words; later, they can use them to decode polysyllabic words.

Assessing the Content of Decoding

Even if a child has knowledge of a process such as letter-by-letter decoding, he she still needs to learn certain phonics/spelling features. For letter-by-letter decoding, the phonics/spelling features would include these:

- Consonant sounds (*sun*, *fan*, *toy*, *dog*)
  - Consonant digraphs (*that*, *thin*, *sheep*, *chick*, *who*, *phone*)
  - Consonant blends (*blue*, *star*, *sleep*, *drink*, *stripe*)
  - Short vowels in consonant–vowel–consonant (CVC) words (*cat*, *pet*, *pin*, *duck*, *log*)
  - Vowel digraphs (*boat*, *green*, *wait*, *pea*)
  - Rule of silent *e* (*race*, *hose*, *bike*)
  - Vowel diphthongs (*join*, *cow*, *boy*)
  - *r*-Controlled vowels (*star*, *bird*, *world*, *her*)
  - *l*-Controlled *a* (*ball*, *call*)
  - Other variant vowels (*caught*, *put*)

This list does not mean that children need to learn rules. The "rules" often do not apply to enough words to render them clear-cut. For example, the rule "when two vowels go walking, the first one does the talking" works only about 45% of the time (Clymer, 1963). It works for *boat* but not for *bread* or *join* or *does*. And the "rule" of silent *e* applies only about 60% of the time. It works in *home* but not in *come*, in *drove* but not in *dove* or *love*, in *save* but not in *have*. Instead, children need to know *patterns* to help them identify individual words. Rather than presenting a hard-and-fast rule, present lists of words that adhere to the pattern so that children can internalize the pattern and do not have to think about the rule. As Cunningham (2001) has observed, the reading brain is more comfortable recognizing patterns than applying rules.

As for phonograms, or rimes, there are hundreds in the English language. Wylie and Durrell (1970) found 286 phonograms in their examination of primary-grade texts, 272 of which are pronounced the same way in every word in which they appear, and they found 37 rimes that account for nearly 500 words. These rimes have been used as a basis for the Z-Test presented in Chapter 4. Clearly, these phonograms could be the start of a phonogram-based program, but they should be seen as only a start. One cannot teach all 272 phonograms, but one might expand beyond the initial set. If a child has difficulties in letter-by-letter decoding, then the next question we ask is this:

- What aspects of phonological awareness are under the child's control?

However, if an older reader is proficient in letter-by-letter decoding but experiences difficulty decoding multisyllabic words, the difficulty is probably *not* with phonological awareness, but with an awareness of the structure of multisyllabic words. In this case, we recommend administering the Multisyllabic Words section of the Informal Decoding Inventory (see Form 4.3, p. 100, in Chapter 4).

Phonological Awareness

Phonological awareness—or the awareness of the sounds that constitute spoken words—is a prerequisite for children to learn to decode as noted in Scarborough's Rope (2001). It is not uncommon for young children, kindergartners, and even some first graders to be unable to think of words as a collection of sounds and, for example, to be unable to provide the first sound of *dog* or *fish*. Stanovich (1986), among many, suggests that early difficulties in phonological awareness underlie later reading problems. Children who do not think of the first sound of *mouse* as /m/ will be unable to use the letter *m* to help recognize the word.

One child in our clinic, Heather, is a wonderful (and amusing) example of this problem. Heather was a first grader when we saw her, the daughter of a dentist and a stay-at-home mother, living in a small Midwestern town. Her mother reported that Heather had difficulties in learning phonics, although she had no problems reading easy preprimer text by memorizing the words. From discussions with her mother, we suspected that she had difficulties with phonological awareness. When asked to say *meat* without the /m/, Heather thought for a while, then said, "Chicken." Although nonplussed, we went on, asking her to say *coat* without the /k/. After some thought, she said, "Jacket."

Heather's difficulties came about because she tended to view words as semantic units, as we might, in order to understand them in speech and reading. We suspect that her answers were attempts to make the concepts themselves smaller by going from the broader categories of *meat* and *coat* to the category members *chicken* and *jacket*. However, to learn to use an alphabetic language, to reach that vital alphabetic insight, a child needs to recognize that words are both meaningful *and* collections of abstract sounds. Because Heather did not have that alphabetic insight, she could not move forward. She was easy to teach, figured out the relations between letters and sounds, and went on to become a good reader. But she did need initial help to make sense of word recognition.

For beginning readers, it is important to consider one last barrier to automatic word recognition. The following question is critical, regardless of the child's level of phonological awareness:

- About which concepts of print does the child have knowledge?

We want to identify the child's range of knowledge regarding basic print concepts, which the active view of reading includes as a "bridging process," connecting word recognition and language comprehension. Print concepts include understanding the left-to-right directionality of English, the fact that spaces are word boundaries, and so forth. These concepts are fundamental to an appreciation of how print works, and they are the foundation for the development of decoding skills.

We have placed print concepts and phonological awareness in separate boxes in our schematic in Figure 1.2. However, it is important to consider how they relate to each other. For example, as young readers are able to attend to the beginning sounds in words (rudimentary phonological awareness), they are better able to match spoken words accurately to written words while reading to achieve one-to-one matching. It is important to consider both, and how they relate to each other.

We have now traced word recognition back to its roots—from automatic word recognition, to fluency in context, to knowledge of sight words and decoding, to phonological awareness and print concepts. As we have demonstrated, this cognitive view complements similar aspects of the other models of reading, such as the SVR, the active view, and Scarborough's Rope. Once these views are put together, it is clear how a reader can fall behind, and how a teacher can target instruction to put the reader back on the road to proficiency.

COGNITIVE MODEL PATHWAY 2: LANGUAGE COMPREHENSION

Even if a reader is proficient in word recognition, they also must be able to comprehend what is read. We encounter students who are able to read fluently but cannot understand what they read. Sometimes this is just a matter of not attending to meaning. When students are given intensive phonics instruction without being asked to attend to meaning, they may not focus on the meaning.

Many other children who have comprehension problems have difficulties understanding the language of the text, even if they can read the words. Although language comprehension involves a great number of elements, we find that the problems we see occur largely in three areas. Put as questions, we ask ourselves:

- Does the student have an adequate *vocabulary* for their age and grade?
- Does the student have the *background knowledge* necessary to understand the particular passage that they are reading?
- Is the student able to use common *text and sentence structures* to aid in comprehension?

Vocabulary

A student's knowledge of word meanings is the best predictor of their comprehension, both of passages containing those words and of passages in general (S. A. Stahl & Nagy, 2006), and vocabulary is displayed in a prominent way in both Scarborough's Rope and the active view of reading. This factor may be predictive because knowledge of words enables readers to comprehend passages, or because vocabulary knowledge is a measure of children's general knowledge or their general intelligence. Either way, students with reading problems tend to have problems with word meanings.

These problems also tend to worsen as children progress through school. Stanovich (1986) attributes this decline to what he calls *Matthew effects*—a term coined by the sociologist Robert Merton, in reference to a biblical verse (Matthew 25:29) echoing the

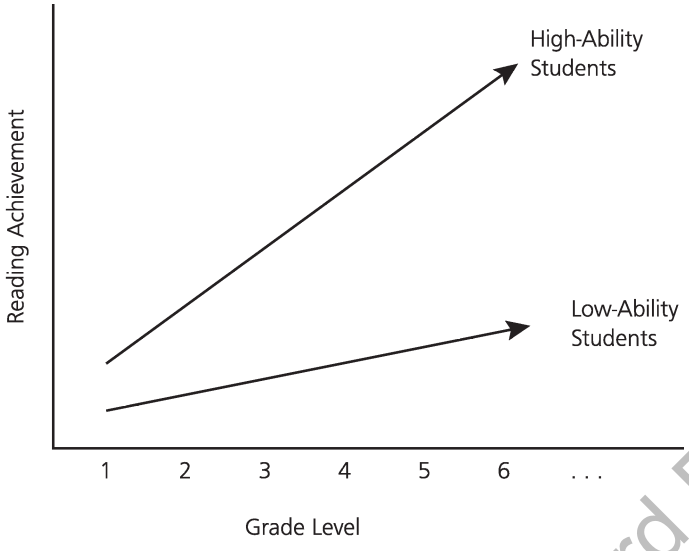

FIGURE 1.4. An example of the Matthew effect.

old adage that the "rich will get richer and the poor will get poorer." Stanovich used the term to refer to the widening gap between proficient and struggling readers (see Figure 1.4).

Stanovich (1986) has suggested that many of the problems readers encounter are not due to underlying causes, but to these students' increasing lack of reading experience. In the case of vocabulary, students who have reading problems both read less text and read less challenging texts. Because they read increasingly less challenging material, they are exposed to fewer words of increasing difficulty. Because most words are learned from exposure in context, students who encounter difficulties with reading learn fewer words. Because they know fewer words, they are less able to read challenging texts and therefore encounter fewer difficult words—thus engaging in a downward cycle that exacerbates the differences between proficient and struggling readers.

Over the school years, children learn an impressive number of word meanings. Estimates are that children typically enter first grade knowing between 3,000 and 6,000 words, learn between 1,000 and 3,000 new words per year, and know as many as 45,000 words by the end of 12th grade (Nagy, 1988). This large number of words cannot be tested directly. Instead, tests are based on samples of words. We suggest a number of standardized tests that assess vocabulary, but we do not provide one in this book because of the difficulties in accurately sampling such a large number of words.

Background Knowledge

Much has been written about the contribution of background knowledge to children's reading comprehension (e.g., Anderson & Pearson, 1984; Hattan, Alexander, & Lupo, 2023; Kintsch, 2013) and both Scarborough's Rope and the active view place background knowledge in a prominent role. Because the purpose of this book is to talk about assessment, we limit our discussion of background knowledge to its effects on assessment.

Background knowledge plays a key role in reading comprehension because the depth of knowledge can influence the depth of text understanding. Children obviously differ in the amount and depth of their background knowledge, and these differences affect their performance on reading tasks. The recent attention to the importance of background knowledge on reader's text understanding in the science of reading movement is promising—we are glad people are paying attention to this! But we have also heard some misunderstandings around background knowledge as a result of this newfound interest.

For example, some people have coined the term *low-knowledge* reader and indicated that if children do not have background knowledge about a topic, they cannot understand a text. This is simply not true. How do we know? Well, we read things all the time that we don't have any background knowledge about—and we can understand those texts just fine. Reading about things we don't know much about is a key way we learn about new things! For example, Sarah recently decided to learn how to make maple syrup, something she has virtually no background knowledge about. The key to her text understanding is whether or not the author of the text she reads describing the process has *assumed* whether she knows anything about the topic. Thankfully, in Sarah's case, the author did not assume the reader knew anything about making maple syrup, and as a result provided a lot of detailed explanations, provided definitions of technical language, and even included pictures and diagrams to help her understanding.

On the other hand, if the author had assumed readers had a great deal of knowledge about how to make maple syrup, that text would have been quite difficult, and Sarah's comprehension would have been greatly diminished. So, what does this mean for assessing comprehension?

To understand whether or not background knowledge (a lack thereof, to be specific) is influencing readers' comprehension, educators must first understand how much background knowledge is needed to understand a particular text (what the author assumed that readers know) and whether or not the readers have that background knowledge.

Standardized measures deal with the issue of background knowledge by utilizing many short passages that do only require the use of fairly common knowledge to understand the text. Thus, if a student has strong knowledge of one topic and weak knowledge of another, the effects of background knowledge should average out over a number of passages. Whereas some standardized assessments write questions that do not require readers to use much outside background knowledge to demonstrate text understanding, other reading assessments get around this by providing a pretest for prior knowledge in the form of questions asked prior to reading the passage. Thus, we recommend that teachers pay attention to how much knowledge authors have assumed readers have or ask children about their background knowledge either before or after they read to gauge an understanding of what they know.

Sentence Structures

The texts that children encounter as they move through school contain progressively more complicated sentences. On average, sentences grow longer and are likely to contain multiple clauses and phrases, which is why both Scarborough and the active view of reading include knowledge of "language structures" as an essential component of read-

ing comprehension. One aspect of language structures is the knowledge of syntax (or sentence structures), which is inexplicably tied to readers' fluency, prosody, and self-monitoring, important contributors to their text understanding. In fact, instruction at the phrase level can help readers, particularly in later elementary school or high school, develop knowledge of sentences' structures and improve both fluency and comprehension (Nomvete & Easterbrooks, 2020).

Because these academic language structures—some specific to disciplines and content areas—are seldom heard in conversation, children must learn them by reading widely across a variety of topics, genres, and content areas. Because there is no sequence that we can use to predict which grammatical structures are likely to be encountered at which grades, it is important for teachers to be aware of the occurrence of challenging syntax. Syntactic challenges make excellent targets for questioning, for think-alouds, and scaffolding self-monitoring practices. Emerging research in this area shows that by exposing children to complex syntax with instruction and support, readers can learn to understand more complex grammatical structures (Knecht, Larsen, & Townsend, 2023; Reynolds, 2021).

Text Structures

We also see children in the clinic who differ in their knowledge of text structures, which is another aspect of "language structures" identified by Scarborough's Rope and the active view of reading. Text structure awareness is a key predictor of general comprehension across the developmental continuum (Oakhill & Cain, 2012). Text structure refers to how an entire paragraph, or perhaps even an entire text, is organized, which can vary depending on genre. For example, one can identify the following elements for narratives:

- Setting and characters, including:
  - Time
  - Place
  - Major characters
  - Minor characters
- Problem that major character encounters
- Goal that major character is trying to achieve
- Events
  - Event 1
  - Event 2
  - Resolution

Research has found that children tend to include these elements in their recall of narratives (e.g., Yussen & Ozcan, 1996). A narrative also can be thought of as comprising chains of events, with one event causing the next. These causal chains form the plot of the narrative.

Expository genres can vary in structure quite a bit more, which can be confusing for children. Sometimes expository texts are structured by presenting a cause-and-effect relationship or a problem and then the solution to the problem, while at other times

the main idea is the topic around which the passage provides supporting and descriptive information. Often, expository texts contain multiple text structures, which makes them extra confusing for readers. Furthermore, the text structure of informational text is important because it often reflects the conceptual organization of the information being presented. An inability to recognize the organizational structure of a text could reflect a lack of understanding concerning how the ideas fit together conceptually, which can lead to difficulty understanding or remembering the ideas in a text.

We find that students who have reading problems also have difficulties using text structures to make meaning of a text. They could be having these difficulties because labored decoding renders them unable to integrate information into a coherent whole, or because they do not understand how to discern the overall structure of a text. Either way, such children can benefit from instruction on text structure.

We assess children's knowledge of text structure through free recall. As we discuss in Chapter 9, this recall involves having a child retell what they have read. Ordinarily, we expect the recall to include most of the important information, be it important story elements (narrative text) or main idea information (expository text). We also ordinarily expect the recall to roughly mirror the order in which the information was presented in the text. Any significant divergence from either inclusion of important information or text order is a cause for concern. Some children recall information haphazardly, as if they were picking out random facts, suggesting poor recall and the need for work in this area.

A word of caution is in order. Some children, because of shyness or a lack of understanding of the task, simply do not recall text well, and their responses may lead a teacher to underestimate how well they have comprehended. Interpretation of poor recall should involve considering whether limited responses may have been the results of reticence or failure to grasp the task. Teachers should always ask questions about the text following a student's free recall.

COGNITIVE MODEL PATHWAY 3: STRATEGIC KNOWLEDGE

Consider how you, as a proficient reader, are probably reading this text. Chances are that you are in a comfortable (but not too comfortable) place, perhaps one you typically reserve for studying. The lighting is good. As to the actual process of studying, there is considerable variation. Some people study with music; others need quiet. Some people use highlighters; others write in the margins, use note cards, or simply read quietly. Some people gain an overview by skimming the whole text; others read it carefully from start to finish. Whatever approach you are taking, chances are that it is the same approach you have taken to reading textbooks in the past. You have found a set of strategies that work for you while you are studying.

Contrast this set of strategies with those used for reading a recreational novel. You probably read the novel in a different place, possibly in bed or in a noisier environment. The contrast between the two activities shows how you, as a proficient reader, have different strategies for reading different types of texts for different purposes. Prior to reading, you decided what your purpose was and chose a set of strategies to help you

achieve your purpose. The strategies are related to environment and learning set (e.g., place to work, quiet or noise) and to cognitive strategies for remembering (e.g., using a highlighter or note cards, reading end-of-chapter summaries first). Scarborough's Rope refers to being able to use different strategies for different purposes as "general literacy knowledge," and the active view calls this "theory of mind."

We find that students with reading problems often have difficulties assimilating different strategies and knowing which should be used for a given purpose. For example, Cameron is a sixth grader with severe reading difficulties. His primary problems involve his slow reading rate and his ponderous process of word recognition. When given the Textbook Interview (see Form 9.6, p. 222) and asked how he would study a chapter for a test, he replied that he would read it straight through. Because of his labored focus on the individual words and consequent slow reading rate, we doubted that he would be able to finish it in a week or that he would remember much of what he had read. When we asked him, he confirmed that he rarely finished half of his weekly reading assignment. When asked what kind of grades he got, he replied, "D's and F's." Cameron was not successful at studying and did not know how to modify his behaviors so that he could succeed. There are techniques that can be used to help children who have reading problems study more effectively, even material they might have difficulty reading straight through (see Schumaker, Deshler, Alley, Warner, & Denton, 1982). We did teach him to use these techniques, which improved his grades somewhat.

The first question we ask is this:

- Does the child have a set of strategies that she can apply to achieve different purposes in reading?

This question is largely answered by interviews, self-assessments, reader think-alouds, and performance assessments (in which children are asked to apply a specific strategy for a specific purpose, like summarizing a text). We provide the Textbook Interview in Chapter 9 (see Form 9.6); with older children, we often spend a great deal of time talking about how they handle content-area texts. Older children often have a great deal of insight into their difficulties, and we try to take advantage of that insight.

Not only do students with reading difficulties often not know specific strategies, but they also often do not understand general purposes for reading or even why they are reading a particular text. In one study (Garner & Kraus, 1981), proficient readers were asked, "If I gave you something to read, how would you know you were reading it well?" They responded that they would know they were reading it well if they understood what they read, if they "got the big ideas," and so on. Struggling readers, on the other hand, often responded that they were reading well when "they said the words correctly" or when the teacher did not correct them. Worse yet, some readers were unable to identify how they would know they were not reading a passage successfully. If readers do not know that the general purpose for reading is to get meaning from print, but instead view reading as a decoding act, they will experience difficulties. Duke and Carwright (2021) refer to this as executive function skills in the active view.

To ascertain the child's understanding of the general purposes of reading, we need to ask a question such as this:

- What does the child view as the goal of reading in general?

As adults, we recognize that the general goal of reading is to comprehend text. Our specific goals inevitably affect how we comprehend, of course, but we clearly understand why we read. Many children, on the other hand, harbor vague ideas about the general goal of reading. Many believe that the goal is to say all the words correctly, to read quickly, or simply to arrive at the last word. They might not deny that understanding what they read is important, but in reality, this goal is dwarfed by the lesser goal of word recognition. Rather than viewing word recognition as a means to an end, they view it as an end in itself. Instruction and programs that overemphasize decoding to the detriment of text comprehension may exacerbate this perception, but it is common among readers everywhere. It is therefore important for teachers to learn about children's views concerning reading, and to attempt to broaden their outlooks if need be.

PUTTING IT ALL TOGETHER

Listing all the assessment questions that we ask in this chapter, as organized by our three-pathway cognitive model, we arrive at the following:

Cognitive Pathway 1

- Is the child able to read texts at their grade placement level with automatic word recognition and adequate expression?
- Is the child fluent in context?
- Does the child have adequate sight-word knowledge?
- Does the child have adequate knowledge of decoding skill?
- Does the child have adequate phonological awareness?
- Which concepts of print does the child apply?

Cognitive Pathway 2

- Is the child able to comprehend the language of the text?
- Does the child have an adequate vocabulary for their age and grade?
- Does the child have the background knowledge necessary to understand the particular passage that they are reading?
- Is the child able to use common text and sentence structures to aid in comprehension?

Cognitive Pathway 3

- Does the child have adequate knowledge of the purposes for reading and possess strategies to achieve those purposes?
- Does the child have a set of strategies that they can use to achieve different purposes in reading?
- What does the child view as the goal of reading in general?

These questions can be used to guide us through the assessment process. By the time we finish a complete assessment of a child, we should have answered most or all these questions. (Some of the questions may prove unnecessary once we begin. For example, a child with strong decoding skills can be assumed to have acquired adequate phonological awareness.)

Now let's return to our three cases at the beginning of this chapter. For Josh, we are concerned about his decoding ability. The first questions we would ask concern his ability to decode, knowledge of phonics patterns, and his phonological awareness because we suspect that difficulties in these areas underlie his difficulties in automatic word recognition and reading connected text. We also want to know about his ability to use context to support fluent reading, his comprehension ability, and his listening comprehension.

As for Latrelle, we suspect that her decoding skills are adequate, although we would still want to assess them. We are more concerned about her automaticity and her ability to use context. We also want to know about her comprehension, and since she is required increasingly to read different kinds of text in fourth grade, we would want to know about her knowledge of strategies. For Dom, we are not as concerned with his word recognition as we are with his comprehension and strategic knowledge.

Throughout this book, you will acquire many tools for identifying your students' strengths and creating a map to help you chart the course for supporting your students as they proceed on their personal path to becoming successful readers. The final chapters provide support in analyzing multiple sources of information to create individual student literacy profiles that serve as a guide to instruction, intervention, and enrichment for your students or tutees.