

Tutorial: Reading Comprehension

WHAT IS READING COMPREHENSION?

Reading comprehension includes all of the processes related to deriving meaning from written language (including books and other forms of written language) and constructing meaning from written language. “Deriving meaning” indicates that there is meaning in texts and that meaning needs to be understood. “Constructing meaning” indicates that often readers go beyond the meaning explicitly contained in the text and add to that meaning based on their own experience and their ability to infer additional or deeper meaning. Thus reading comprehension is much more than the ability to read individual words and know what those words mean. To comprehend what one reads is to understand the meaningful message sent by the author.

The following knowledge, skills, and dispositions are all brought to bear in comprehending a text:

Literacy Awareness

- *Literacy awareness:* Literacy awareness includes knowing that written language has meaning and purpose, and that there are conventions in printed language (e.g., left-right and top-down progression of words on the page; sequence of pages; title page; table of contents; index; etc).

Decoding Skill

- *Decoding skill:* Decoding skill includes knowledge of the alphabetic code (i.e., that there are systematic relations between the sounds of the language and written letters and combinations of letters on a page); ability to attack and decode (“sound out”) familiar and unfamiliar words; and reasonable fluency (ease and speed) of decoding. Fluent decoding is critical for effective comprehension; students who do not decode fluently exhaust their limited cognitive resources on decoding and are therefore unlikely to comprehend effectively what they read.

Language Factors

- *Language knowledge: Phonological awareness:* Phonological awareness refers to awareness of the sound system of the language. This includes awareness of words that rhyme (end the same) and alliterate (start the same); ability to break words into component syllables (e.g., blackboard = black + board) and component sounds (mat = m+a+t). The latter is known as phonemic awareness and is critical for fluent decoding.
- *Language knowledge: Word knowledge:* Word knowledge includes knowing the meaning of words (e.g., understanding them when they are spoken), including multiple meanings of ambiguous words. Good readers have a broad vocabulary.
- *Language knowledge: Discourse structures:* Discourse structures are the conventional ways in which people organize stories, descriptions, explanations, and the like. For example, a simple story (or an episode in a longer story) typically begins with the characters, place and time; then moves to some event that starts the action of the episode; then describes how the main characters react to that event; then describes how they plan to deal with the issue; then presents the unfolding of the actions; then offers a resolution. This standard way to organize a story is called narrative organization, narrative discourse structure, or story grammar.
- *Language knowledge: Syntax rules:* Reading comprehension also assumes syntax knowledge and an ability to infer meaning from the order of words (e.g., “John hit Tom” means something different from “Tom hit John”).

Cognitive Factors

- *Cognition: Knowledge of objects and events in the world:* Reading comprehension assumes some knowledge about the world that is described by the text. If the student is completely ignorant about the topic of a text, then comprehension will fail despite good decoding ability. Ignorance of the topic is not a reading problem per se, but certainly affects comprehension in a dramatic way for all readers. Good readers have broad world knowledge.
- *Cognition: Attentional ability:* Ability to comprehend extended text assumes the ability to maintain attention over time. When the mind wanders, comprehension falters. **[See Tutorial on Attention.]**
- *Cognition: Organizational ability:* Reading comprehension assumes an ability to relate sentences (actions and themes) presented in the text and to create a unified whole out of the parts of a text. Reading comprehension also assumes an ability to relate the information presented in a text to what the student already knows about the world. These abilities to relate or make connections are organizational skills.
- *Cognition: Memory:* Reading comprehension assumes the ability to hold many units of information in mind at one time (working memory). It also assumes the ability to encode into memory what one has read, store those memories, and later retrieve them in order to understand later parts of the text. **[See Tutorial on Memory.]**
- *Cognition: Reasoning ability:* Effective reading of a text assumes an ability to distinguish between what is important and what is unimportant, to make predictions, to interpret events, to draw inferences, and the like.

Self-Regulatory/Executive Function Processes

- *Self-regulatory/executive function processes:* Preparation for reading: Good readers know why they are reading a text, preview the text, ask themselves questions to be answered by the text, and in other ways preset themselves for comprehension. Young children may do a “book walk”, that is, page through a picture book to get a sense for what the story is about. Older students will survey a text before reading, for example looking at chapter and section headings, looking at chapter comprehension questions, and the like.
- *Self-regulatory/executive function processes:* Interpretation of text as problem solving: Good readers ask questions of the text as they read. They try to summarize and get the main ideas. If there are parts of the text they do not fully understand, they take that as a problem to be solved rather than simply accepting their lack of comprehension. **[See Tutorial on Problem Solving.]**
- *Self-regulatory/executive function processes:* Comprehension monitoring: Good readers pay attention to how well they understand what they read. If there are gaps in comprehension, they do something about it, for example, by rereading sections of the text. **[See Tutorial on Self-Monitoring.]**
- *Self-regulatory/executive function processes:* Seeking help: Good readers seek help when they need it, for example by asking others for explanations, using a dictionary, and the like.
- *Self-regulatory/executive function processes:* Sense of self: Good readers have a sense of themselves as good readers and enjoy reading. **[See Tutorial on Sense of Self.]**
- *Motivational/emotional factors:* Value of reading: Good readers value the activity of reading. They take pleasure in reading and love to read. **[See Tutorial on Motivation.]**
- *Motivational/emotional factors:* Desire for improvement: Good readers constantly seek to improve their reading ability.
- *Motivational/emotional factors:* Goals: Good readers have goals (e.g., acquisition of more knowledge; preparation for a test) that reading will help them to achieve.
- *Motivational/emotional factors:* Self-confidence: Good readers have confidence in their ability to read and understand what they read.

In light of the wide variety of skills, knowledge, and dispositions that come together to support reading comprehension, it is not surprising that reading comprehension is an academic difficulty for many students, including many students with TBI.

Reading comprehension has many parallels with listening comprehension. For example, a listener must understand the words that are spoken, the connections among the utterances, the connections with their knowledge of the world, and the like. The most obvious difference is that with reading, the words must be

decoded from print. However there are other differences in addition to this obvious difference. For example, when one is listening, the speaker normally pays attention to whether or not he is being understood and if not, does something to improve the listener's comprehension. In the case of reading comprehension, the writer cannot modify the text to fit each reader. The text is fixed. Similarly, readers cannot ask for explanations from the writer whereas listeners can ask speakers for clarification. Thus there is a comprehension burden on readers that is greater than on listeners.

WHY IS READING COMPREHENSION IMPORTANT FOR MANY STUDENTS AFTER TBI?

Depending on age and location of the brain injury, students with TBI can have a variety of problems with components of reading and reading comprehension. For example, young children are often impaired in areas that are developing rapidly at the time of injury. At ages 6, 7, and 8, children are mastering reading decoding and decoding fluency. Therefore, an injury at that time may disrupt the process and cause persisting problems with decoding. However, most students who have learned to decode before the injury do not lose that skill after TBI.

More commonly, however, students with TBI have difficulty in areas of reading affected by cognitive and executive, self-regulatory impairments. **[See Tutorials on Cognition, Attention, Organization, Memory, Problem-Solving, Strategic Thinking and Learning, Self-Regulation/Executive Function Routines.]** Problems with attention, organization, memory, and problem solving affect reading comprehension in ways suggested by the lists above. Organizational and memory problems are particularly hard on reading comprehension. A text is typically composed of a large number of sentences expressing a large number of distinct ideas. These ideas have to be related to each other and to what one already knows about the topic if the text is to be comprehended. Relating ideas in these ways requires organizational and memory skills that are often impaired in TBI, especially frontal lobe injury.

Consider the following short narrative: "John went to a ball game yesterday. He caught a foul ball. He's happy despite the pain in his hands." Understanding this story requires bringing to bear some background understanding of baseball. It also requires perceiving the relations among the sentences. For example the happiness and pain referred to in the third sentence relate to catching the ball referred to in the second sentence. Reading is an ongoing process of "making connections" of this sort, connecting ideas in the text to one another and to background knowledge of the world. Making these connections is difficult for students with organizational and memory impairments.

Executive function/self-regulatory problems in the areas of planning, self-monitoring, problem solving, and strategic behavior also contribute to problems with reading comprehension. Learning how to comprehend what one reads is a process of acquiring and automatizing the use of reading comprehension strategies (described below). Reading in a strategic way is difficult for students with executive, self-regulatory impairments. These cognitive and executive function/self-regulatory problems are commonly observed after TBI, especially frontal lobe injury. Therefore, reading comprehension problems are also common and require special attention.

Fortunately two of the most important contributors to reading comprehension are not especially vulnerable in TBI: vocabulary and knowledge of objects and events in the world. Often students with TBI retain the knowledge of the meanings of words and their general knowledge of the world acquired before the injury. However, if the student has new learning problems, then over time vocabulary knowledge and world knowledge may become relatively weak; that is, the student may fall progressively further behind. Thus attention to these two areas of reading comprehension may be important for students with TBI.

WHAT ARE THE MAIN FEATURES OF INTERVENTION AND SUPPORT THAT ARE IMPORTANT FOR STUDENTS WITH READING COMPREHENSION PROBLEMS AFTER TBI?

Understanding the Problem

As always, step one in helping students with complex disability is understanding the problem. For example, difficulty with reading comprehension could be a consequence of weakness in any of the domains (outlined above) that contribute to successful reading. The problem exploration steps on this web site should help staff and family identify the factors associated with the student's reading difficulties. Intervention can then be targeted to the set of problems known to contribute to the student's difficulty with reading comprehension.

Environmental Compensations

Students with reading comprehension problems should receive some combination of the intervention strategies outlined below to improve their reading. However, there are also compensatory procedures that might be useful in addition to more direct intervention strategies.

- *Books on tape:* Students with relatively superior listening comprehension can listen to books on tape (commercial or created for that student), possibly in combination with reading the text.
- *Condensed content:* Parents, teachers, special education specialists, or speech-language pathologists could write condensed and simplified versions of assigned readings that the student can read prior to or instead of reading the assigned text.
- *Highly condensed content and discussion:* Parents, teachers, special education specialists, or speech-language pathologists can distill main ideas from assigned readings, print them on 3X5 cards, and read the cards with the student while discussing the meaning.

Teaching Word Knowledge and World Knowledge

Critical to comprehending what one reads is an understanding of the words on the page and at least a general understanding of the topics included in the text. Students with TBI often retain their word knowledge (vocabulary) and general knowledge of the world acquired before the injury. Knowledge of this sort is stored in posterior brain regions, which are not especially vulnerable in TBI closed head injury.

However, because of problems with new learning, the student may fall progressively further behind in vocabulary knowledge and world knowledge over the years after the injury. Therefore attention to both types of knowledge may be a component of the student's comprehensive reading comprehension program. What follows are some common suggestions regarding vocabulary acquisition and acquisition of world knowledge.

Vocabulary Practice: Words from the Curriculum: Given the many thousands of words that exist in any language, teaching vocabulary can seem to be a daunting task. The most reasonable way to simplify and organize the task is to select words from the student's academic curriculum. Thus the words to be focused on by teachers, speech-language pathologists, special educators, and parents should be words that student needs to learn in order to comprehend texts and lessons in the classroom. These include words from reading books, and from science, social studies, and other content classes.

Teaching the meaning of a word includes exploring the many associations that comprise the word's meaning. In the case of a noun, for example, it is not sufficient for the student to point to a picture of the item when named. She should know what category the item falls into, what it does (if anything), what it is used for, what parts it has, what features it has, what it is made of, where it is commonly found, and other common associations. This broad and deep understanding is true knowledge of a word's meaning. Thus teachers and therapists should teach word meaning in this organized associative manner. Furthermore,

context is important in the teaching. Students should have exposure to a variety of contexts in which the word can be used, especially contexts relevant to the classroom curricula.

Parents can use and explore targeted words and their meanings during dinner time and other relaxed conversational times. Teaching word meaning at home need not be a boring “school-like” activity, but rather conversational use and exploration of the word, using language at the student’s level of comprehension and connected as much as possible to the student’s interests.

In addition, the more students read, the faster their vocabularies grow. Therefore there is a strong rationale for encouraging students to read as much as they can. Homes should have interesting and engaging reading materials at an appropriate reading level for the student. For example, topically interesting magazines are available at many reading levels, including sports, current events, and popular culture magazines.

World Knowledge: Themes from the Curriculum: Given the infinite extent of possible knowledge of things, places, events, and people in the world, teaching world knowledge is a genuinely daunting task. Again, the most reasonable way to simplify and organize the task is to select themes from the student’s academic curriculum. General education teachers, special educators, therapists, and parents can focus on and discuss themes and issues that are found in reading texts or in the student’s content classes.

As in the case of word meanings, parents can help the child acquire relevant world knowledge by knowing what is being taught at school and then weaving those curricular themes into dinner time and other relaxed conversations. In addition, discussion of daily events presented in the newspaper or on TV can help the student broaden his horizons and learn about events occurring in the world. Furthermore, the more the student reads, the more she learns about the world; therefore fun reading beyond school assignments should be encouraged.

Teaching Reading Comprehension Strategies


A great deal of research has shown that acquisition of reading comprehension strategies improves comprehension. Two separate issues are involved: selecting strategies to teach and selecting teaching procedures to teach the strategies.

Reading Comprehension Strategies: There is a relatively small set of strategies that tend to be used by good readers and taught in varying combinations in both regular and special education classrooms. They can be divided into strategic procedures used before reading, procedures used during reading, and procedures used after reading.

Strategies used before reading: Before reading a text, good readers do some combination of the following:

- *Clarify the purpose of reading:* The propose of reading might be: “I want to enjoy this; I need to find out; I need to understand; or I need to answer the following questions:.....”
- *Preview or survey the text:* In joint book reading with preschoolers, parents and children might page through the book, looking at pictures and wondering out loud what the book might be about. In high school text book reading, the student might first look at the chapter questions, at the teacher’s assignment, or at the section headings. In these ways, the student is surveying the text and gaining a general orientation to the content of the text much like the preschooler’s “book walk”. In both cases, reading comprehension is facilitated because the reader is oriented to the content of the reading.
- *Predict the content or outcome:* Predicting what will occur in the text or what will be learned from the text helps the reader attend to the material in a focused manner.

Strategies used during reading: While they are reading, good readers pause and do some combination of the following:

- *Summarize*: They try to summarize to make sure they comprehend.
- *Image*: They create a mental image of what they have read.
- *Organize*: They organize the information – make connections – possibly filling in a graphic organizer (See  **Tutorial on Organization**).
- *Elaborate*: They connect what they are reading to what they already know. This can be facilitated by routinely asking “why” questions or other questions while reading.
- *Reread*: They reread parts that they know they did not properly understand. This of course assumes that they are monitoring their comprehension. Students should be taught to routinely ask themselves, “Does this make sense?”

Strategies used after reading: After completing a text, good readers do some combination of the following:

- *Summarize*: They try to summarize what they have read to make sure they comprehend it.
- *Review*: They review in their minds the main points of the text.
- *Answer questions*: They answer questions that may have been provided by the teacher or parent.
- *Apply the content*: They try to apply the content to other domains they are familiar with or to their own experience.
- *Make judgments*: They make judgments about how good the reading was, how much they liked it, whether the reading met its purpose, and the like.

Teaching the Strategies:

1. *Select useful texts*: For example, to teach narrative organization, select a story that has an obvious organization that fits nicely into a picture of narrative organization described above.
2. *Select strategies at an appropriate developmental level*: For example, first and second graders can be taught the strategy of completing a “book walk” before reading; middle and high school students can learn how to survey a text in more sophisticated manner.
3. *Select an appropriate number of strategies to teach*: For example, young grade schoolers might learn one before-reading, one during-reading, and one after-reading strategy. Older students may be capable of acquiring a larger number of strategies and using them as a package.
4. *Explicitly teach strategies*: Students should be explicitly taught the strategies, why they are important, and how to use them, rather than assuming that they will “pick them up” with repeated exposure (e.g., observing the teacher or parent using strategies).
5. *Model strategic reading (teachers, parents, and peers)*: In addition to explicit instruction, teachers and parents should show students how to use strategies and that they are helpful in comprehending texts. In a group setting, peers can model the use of strategies.
6. *Model good oral reading (teachers, peers)*: Teachers and good readers should also model for other students what fluent reading sounds like, with appropriate emphasis, pauses, self-questioning, and the like.
7. *Make strategies salient (e.g., graphic organizers)*: Strategies should be a salient part of the classroom environment. For example, they should be printed on posters on the wall of the classroom. Narrative organization should be represented by clear graphic (pictured) representations of that organization.
8. *Encourage deliberate, successful use of strategies*: Students should practice using strategies in a way that demonstrates their usefulness for understanding text.
9. *Encourage student self-monitoring*: Students should develop a habit of monitoring comprehension (“Do I understand what I just read?”) and also monitoring the effectiveness of strategies (“Is this strategy helping?”) [**See Tutorial on Self-Regulatory/Executive Function Routines.**]
10. *Gradually transfer control, with ongoing coaching*: Initially the teacher or parent should model and cue the use of strategies. Gradually, control of strategy use should be turned over to the student.
11. *Ensure transfer of strategies*: Strategies should be taught in the context of a variety of types of reading, in a variety of places, and with a variety of people.
12. *Use reading groups and discussion*: Reading groups are a useful context to practice the deliberate, out-loud use of strategies. Whether discussion takes place in reading groups, in class, or at home with parents, the level of language should match the students’ abilities.

13. *Continue strategy instruction over several years of schooling:* To make strategies routine – to become a habitually effective reader – strategies should be taught and encouraged over several years of schooling.

Special Considerations for Specific Cognitive Problems after TBI

Attention: Students whose reading comprehension is negatively affected by fluctuating attention should use strategies known to be effective for attention problems. **[See Tutorial on Attention]** This might include a series of short reading sessions rather than one long session, markers in the text designed to prompt self-monitoring of attention and comprehension, and other procedures outlined in the tutorial on attention.

Organization: Students whose reading comprehension is negatively affected by organizational problems should use strategies known to be effective for those problems. **[See Tutorial on Organization]** This might include reading short passages during each reading session, placing the information into a graphic organizer, routinely asking the question, “How do these ideas go together?”, and other procedures outlined in the tutorial on organization.

Memory: Students whose reading comprehension is negatively affected by memory problems should use strategies known to be effective for those problems. **[See Tutorial on Memory]** This might include frequently reviewing what has been read before proceeding with new passages, stopping to take notes while reading (and later reviewing the notes), possibly reading shortened abridged versions of longer texts, and other procedures outlined in the tutorial on memory.

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