

# Inference Instruction to Support Reading Comprehension for Elementary Students With Learning Disabilities

Colby Hall, PhD<sup>1</sup>, and Marcia A. Barnes, PhD<sup>1</sup>

## Abstract

Making inferences during reading is a critical standards-based skill and is important for reading comprehension. This article supports the improvement of reading comprehension for students with learning disabilities (LD) in upper elementary grades by reviewing what is currently known about inference instruction for students with LD and providing detailed suggestions and a five-step process for teaching students to make text-connecting and knowledge-based inferences while reading. By bolstering this key reading comprehension skill in the upper elementary grades, teachers can better prepare students for the increased reading comprehension demands of middle school.

## Keywords

reading comprehension, struggling readers, reading difficulties, inferences, background knowledge

Reading with comprehension involves building and continuously revising a mental model of the text in memory (Kintsch & van Dijk, 1978). This mental model looks something like a “network, with nodes that depict individual facts and events, and connections that depict meaningful relations between them” (Rapp, van den Broek, McMaster, Kendeou, & Espin, 2007, p. 292). These connections are known as *inferences*. A reader makes inferences by establishing appropriate, meaningful connections between separate pieces of information literally stated in the text (i.e., “text-connecting” inferences) and between information literally stated in the text and the reader’s background knowledge (i.e., “knowledge-based” or “gap-filling” inferences). A *text-connecting inference* might connect a pronoun with the person or thing it refers to. A *knowledge-based inference* might draw on what the reader knows about people’s motivations to infer why a character performed a given action. Some text-connecting and knowledge-based inference types are more necessary (e.g., pronoun resolution, causal inferences) and some less necessary (e.g., predictive inferences) for reading comprehension. If the reader does not generate inferences that are necessary for making sense of the text then comprehension will suffer; the reader may understand individual sentences but will not be able to derive the overall meaning of the text.

Students with higher levels of inference skill score higher on tests of reading comprehension than do students with low levels of inference skill. This is true for both elementary-aged (Cain, Oakhill, & Bryant, 2004; Kendeou, Bohn-Gettler, White, & van den Broek, 2008) and adolescent readers (Ahmed et al., 2016; Barth, Barnes, Francis, York, & Vaughn, 2015; Cromley & Azevedo, 2007). Students with learning disabilities (LD) tend to make fewer inferences than their typically developing peers; in fact, they often fail to make inferences altogether when reading text (Barnes, Ahmed, Barth, & Francis, 2015; Barth et al., 2015; Denton et al., 2015).

The Common Core State Standards expect students not only to “read and comprehend complex literary and informational texts independently and proficiently” (National Governors Association, 2010) (i.e., CCSS.ELA-LITERACY.CCRA.R.10) but also to “make logical inferences” and “cite specific textual evidence ... to support

---

<sup>1</sup>University of Texas at Austin, Austin, TX, USA

## Corresponding Author:

Colby Hall, PhD, Meadows Center for Preventing Educational Risk, University of Texas at Austin, 1 University Station D4900, Austin, TX 78712, USA.  
Email: [colbyhall@gmail.com](mailto:colbyhall@gmail.com)

conclusions drawn from the text” (i.e., CCSS.ELA-LITERACY.CCRA.R.1). Students should “determine central ideas or themes” (i.e., CCSS.ELA-LITERACY.CCRA.R.2); “analyze how and why individuals, events, and ideas develop and interact” (i.e., CCSS.ELA-LITERACY.CCRA.R.3); and “assess the ways in which point of view or purpose shapes the content and style of a text” (i.e., CCSS.ELA-LITERACY.CCRA.R.9). In other words, the Common Core State Standards expect students to make the text-connecting inferences that support basic comprehension and also the knowledge-based inferences that enable readers to establish causality, draw conclusions, and infer important relationships.

But how can teachers help upper elementary students with LD make inferences when they read? This article describes types of inferences that are necessary for reading comprehension along with those that are not quite so important. Next, it details instructional procedures for helping upper elementary students with LD improve their inference skill during reading. The strategies and instructional procedures described in this article are derived from intervention research that has demonstrated benefits for struggling readers and/or students with LD.

## Types of Inferences: What Is Essential?

### *Predictive Inferences: Not So Important*

When teachers ask students to generate inferences, they often focus on predictive or *forward* inferences. They ask students to infer what will happen next based on clues in the text. However, research demonstrates that students who comprehend well do not usually make predictive inferences; and when they do, it is only because there are ample context clues pointing towards a specific prediction. For example, McKoon and Ratcliff (1992) determined that, when a reader encountered the sentence, “The director and the cameraman were ready to shoot close-ups when suddenly the actress fell from the 14th story,” he or she typically did not infer that the actress died and perhaps ought not. If a reader generates an incorrect prediction and subsequent text refutes it, comprehension difficulties are likely to result. If anything, the reader is more likely to infer something broader and more general (e.g., something bad happened). For these reasons, it probably makes little sense for teachers to prompt students to make specific predictive inferences while reading. Instead, teachers will help students most by focusing on the inference types described next.

### *Text-Connecting Inferences*

Text-connecting or *referential* inferences are often ignored in the classroom, partly because expert readers make text-connecting inferences so effortlessly that they are not even

aware of having made them. Nevertheless, these inference types have been found to be most consistently important for reading comprehension (van den Broek, Beker, & Oudega, 2015), and children with LD often do not make this type of inference effortlessly and consistently. Text-connecting inferences require the reader to connect two separate pieces of information literally stated in the text. There are three important categories of text-connecting inferences: anaphoric, lexical, and inferential.

**Anaphor Resolution.** This type of inference requires students to connect a noun or noun phrase with the word or phrase to which it refers. For example, in order to form a coherent mental model of the sentence, “Rafael was cold, so Omar gave him his jacket,” the reader must infer that the “him” refers to Rafael, whereas the “his” most likely refers to Omar. There are other nonpronoun noun phrases for which readers must determine referents. Consider these sentences: “If sunlight did not reach the savannah’s grasses, they would die. Antelopes and other animals that eat the grasses would disappear. And the carnivores that depend on those grazers for food would disappear too.” It is necessary for the reader to connect “grazers” to the phrase it refers to in the previous sentence (i.e., antelopes and other animals that eat the grasses) as well as to infer that “they” in the first sentence refers to “grasses.” Although all three of these examples are within single sentences or between adjacent sentences, anaphor-resolution inferences must often be made across larger chunks of text.

**Lexical Inferences.** A reader must make a lexical inference (Stafura & Perfetti, 2015) in order to comprehend the following sentences: “While Cathy was riding her bike in the park, dark clouds began to gather, and it started to storm. The rain ruined her beautiful sweater” (Stafura & Perfetti, 2015, p. 20). In order to comprehend, the reader has to associate the word “storm” with the words “dark clouds,” and the word “rain” with the word “storm.” The reader then has to make the implicit connection that the dark clouds caused the storm, which included rain. Although proficient readers may generate lexical inferences effortlessly, students with LD often require explicit instruction in generating inferences of this type.

**Inferring Word Meanings.** Finally, readers must make text-connecting inferences to determine word meanings from context. Text often contains words that are not part of the student’s oral language vocabulary; word meanings need to be inferred from context. For example, the reader may infer the meaning of the word “herbivore” based on words and phrases in the following text: “All elephants are herbivores. They eat grasses, bark, twigs, leaves, and fruit.” Because students with LD often have difficulty making inferences for which context must be used to infer word meaning

(Cain, Oakill, & Lemmon, 2004), it is important for teachers to provide students with strategies to infer word meanings from clues in text.

### Nonpredictive Knowledge-Based Inferences

There are a variety of nonpredictive knowledge-based inferences that skilled readers make in order to establish and maintain reading comprehension. These inferences require the reader to go beyond the text and draw on background knowledge. For example, take the following sentences: “The campfire started to burn uncontrollably. Tom grabbed a bucket of water” (Bowyer-Crane & Snowling, 2005, p. 192). In order to understand why Tom grabbed a bucket of water, it is necessary for the reader to make a causal connection by activating the background knowledge that water puts out fire and relate the second sentence to the first by generating the inference that Tom grabbed the bucket of water because he was trying to put out the fire. Readers must frequently make *causal inferences* in order to explain or establish logical antecedents of events or information in one sentence by connecting them to events or information in another sentence. They must also sometimes generate *spatial inferences* (i.e., Where are the protagonists and how are they moving around in a particular setting?), *temporal inferences* (i.e., How has the author jumped backward or forward in time while telling a story?), and *inferences about intentions, motivations, emotions, and/or traits* that are either crucial for establishing comprehension immediately or inform comprehension during subsequent sections of text (van den Broek et al., 2015). For example, it is sometimes important to understand a character’s motivations, goals, or emotions in order to understand the character’s actions or reactions to other characters and situations.

### Inference Instruction

Effective inference instruction helps students to

- identify clues or key words in the text and use these key words to furnish answers to inferential questions,
- activate background knowledge and interweave this knowledge with information in the text during reading, and
- generate or answer inferential questions as a way of identifying gaps in text, confirming tentative inferences, and/or improving the automaticity of inference generation (Hall, 2015).

Teachers can employ the *key word* approach to help students identify relevant words, phrases, or sentences in text that need to be integrated with other information in text or with the reader’s background knowledge. First, the teacher

will identify the teaching point in simple, student-friendly language: “I’m going to teach you how readers look for important clue words in the text and then combine these clue words with their knowledge about the world to make an inference, or ‘solve a mystery’ in the text.” After explicitly identifying this teaching point, the teacher will introduce a passage like the passage below and think aloud to model how a reader identifies “wave” as a clue word indicating that the story setting was a beach.

Billy was crying. His whole day was spoiled. All his work had been broken by the wave. His mother came to stop him crying. But she accidentally stepped on the only tower that was left. Billy cried even more. (Yuill & Oakhill, 1988, p. 38)

For the benefit of students, the teacher will think aloud:

What’s going on here? I know Billy is crying, but what happened to make him cry? Where is he, even? “Crying” and “spoiled.” Hmm. They don’t help me. There are a whole lot of things that could spoil a day and make a boy cry. But “wave!” Oh, maybe “wave” is an important clue word!

After thinking aloud about the possible settings indicated by “wave,” the teacher will again model, by thinking aloud, how she links “wave” with “tower” in order to infer that Billy was at the beach and the tower was a part of a sand castle: Billy was crying because his sand castle was wrecked by a wave. Once the teacher models her thinking, she will then provide students with another, similar passage and encourage students to think aloud as they connect clue words to make an inference.

Teachers can also show students how to *activate prior knowledge and integrate this knowledge with information in text* in order to generate inferences as they read. This can be as simple as asking students a question about their previous experiences with an important idea in a story prior to reading. Then, students can be encouraged to hypothesize about what might happen under similar circumstances in the story they are about to read. For example, prior to reading a story, Hansen and Pearson (1983) asked students to “tell us about a time when you were embarrassed about the way you looked” (p. 823). After listening to students’ responses, the teacher can let students know that, “in our next story there is an old man who is embarrassed about the way that he looks,” and ask them, “What do you think is the thing that embarrasses him?” The purpose of these questions is not to predict forward what will happen in the text but rather to give students practice building, activating, and integrating relevant background knowledge with information in text.

Finally, it is effective for teachers simply to prompt students to generate and answer inferential questions during and after reading a text. Teachers can invite students to act the part of the teacher in creating inferential questions about

a recently read passage in order to quiz peers. Sentence starters or example inference questions (e.g., “Who is [pronoun]?” “What is the meaning of [unfamiliar word] based on clues in the text?” “Why do you think ... ?” “What caused ... ?” or “How did X lead to ... ?”) are often helpful in guiding students to create inferential questions.

Alternatively, teachers can give students opportunities to discuss answers to teacher-generated inferential questions. When students are generating very few knowledge-based inferences as they read, it is most effective for teachers to ask students the general question, “How does the sentence you just read connect with something that happened before in the story?” at regular intervals during reading (McMaster et al., 2012). When students are generating knowledge-based inferences but these inferences are inaccurate and not grounded in textual clues, it is most effective to prompt students to make specific causal connections, asking them “Why did X do Y?” or “What caused Z to happen?” (McMaster et al., 2012).

## A Step-by-Step Guide to Inference Instruction

Let’s imagine that a teacher, Ms. Soto, is working with small groups of fifth-graders with LD. Below are the steps she would follow to implement inference instruction in her classroom (see Note 1). The five steps described in this section draw on principles of effective inference instruction for students with LD (Hall, 2015, 2016) as well as on principles of effective instruction for students with LD more generally, including the idea that explicit and systematic instruction benefits students with learning difficulties more than inductive approaches to instruction, for both basic and complex, high-level skills (Biancarosa & Snow, 2006; Faggella-Luby & Deshler, 2008).

### Preparation

**Step 1:** Ms. Soto will choose a text. This text could be expository or narrative, nonfiction or fiction. Because struggling readers generate fewer inferences in informational text (Denton et al., 2015), it may be helpful for her to begin teaching students to make inferences in narrative text and then to move on to informational text. If she uses narrative text initially, however, it will be critical for Ms. Soto to focus considerable instructional time teaching upper elementary-aged students to generate inferences in expository texts once students become more proficient at making inferences in narrative texts (National Governors Association, 2010). For the purposes of this article, imagine that Ms. Soto chose the novel *Wonder* (Palacio, 2012).

**Step 2:** Before each day’s lesson, Ms. Soto will prepare students’ books with stopping points, marked with Post-It flags or highlighted with highlighters. Ms. Soto will choose these stopping points deliberately, inserting Post-It flags at the end of sentences where she worries that students’ comprehension might break down or in places where generating an

inference would furnish a more complete and accurate understanding of the text. Good stopping points are places where

- something needs to be explained (e.g., “Why did he do/say that?”),
- the referent of a pronoun or another anaphor is ambiguous (e.g., when there are two male characters and one of them needs to be connected to the “he” in a sentence), and
- there is a tricky word that most students will not know but whose meaning is decipherable from context clues.

Because of the memory and attention capacity limitations of many students with LD as well as the consistent findings of disproportionate effects on inference making for students with reading difficulties as text distance increases (Barth et al., 2015; Cain et al., 2004), Ms. Soto may want to scaffold instruction so that students initially make inferences across only very short text distances. For example, Ms. Soto will make sure that context clues supporting a text-connecting inference of word meaning are within a sentence adjacent to the word. As another example using a knowledge-based inference, Ms. Soto will make sure that a causal antecedent (e.g., “He had a pounding headache”) that is an ingredient in an inference is in a sentence close to its consequence (e.g., “He rummaged around in the drawer for the pills that his mother had said were there”). When she asks, “Why was he looking for pills?” her students will not have to look far for the character’s motivation. Eventually, Ms. Soto will support students’ generation of inferences across longer distances by modeling long-distance inference generation and providing students opportunities for guided practice paired with corrective feedback.

### Define Inference and Describe Routines

**Step 3:** On the first day of instruction (see Figure 1 for part of a lesson script), Ms. Soto will not only introduce the concept of an inference but also explain to students how to stop at stopping points and refer to questions on the day’s *question sheet*. See Figure 2 for an example question sheet. Even more important, Ms. Soto will model how to discuss and debate (i.e., referring to the text for evidence) answers to inference questions. It may be helpful for her to tell students to cover answer options with an index card at first so that they can initially discuss the answer to each multiple-choice question as though it were open ended. Then, Ms. Soto will show students how to

- consider answer options;
- discuss, debate, and find evidence to support given answers; and finally
- reach consensus and scratch off an answer on a scratch-off answer sheet.

**Lesson 1: Introduction to Inferences: “Reading a Book is Like Looking at an Iceberg”**

1. Teach: [Show/project an underwater iceberg image]: In this photograph, you can see that when we look at an iceberg from the vantage point of a boat or a plane, what we see is actually just a small part of it, just the “tip of the iceberg” that floats above the water. Most of the iceberg is actually below the water’s surface. It’s amazing how much of it is invisible to the eye, hidden beneath the water! Reading a book is like looking at an iceberg. If you want to understand the real size and shape and reach of an iceberg, then you have to look beneath the surface of the water, or make some educated guesses about what is beneath the surface based on clues. If you want to understand a book or an article, you have to look beneath the “surface” of the words, or make educated guesses about what’s *really* going on (but is not written on the page). When you do this, you are making an **inference**.
2. Model: We do this all the time in our everyday lives when we’re not reading. Let me give you an example. Today, as I was driving to school, I saw a man running and frantically waving at a bus that is pulling away. When I saw him, I immediately, almost unconsciously made an inference. I looked at some key clues: his actions (the running, his frantically waving arms); what was going on around him (the bus driving away); then, practically without even realizing it, I used my knowledge about the world and my experiences with buses/people who are running/waving their arms (people are often worried about missing their bus; usually, people run and wave their arms when they’re trying to get someone’s attention) and I inferred: the man must have just barely missed his bus, and he’s waving his arms to try to get the attention of the bus driver, hoping that maybe the bus will wait and let him on. [Project Graphic Organizer 1, representing the knowledge and clues from the story that you used to make the inference.]
3. Guided practice: Okay, let’s see if you guys can make an inference given this scenario: You are at a corner and see two cars stopped at an intersection, one behind the other. The rear car starts honking its horn. What can you infer? Why is the rear car honking? Turn and talk to your partner and try to make an inference together. [Accept possible answers. Project Graphic Organizer 2, representing the knowledge and clues from the story students used to make the inference.]
4. Independent practice: [Provide students with another real-life inference scenario. Ask students, in partners, to discuss their inferences and put the text evidence and knowledge they used to make their inferences into blank graphic organizers.]

**Figure 1.** Introductory Inference Instruction Lesson Script.

The process of teaching students how to engage in productive small group discussions will likely take longer than one lesson. After the introductory lesson, Ms. Soto will need to step in and coach students frequently during partner/small-group conversations, asking, “What information from the text did you use to make that inference?” or reminding them to discuss the answers to inference questions with multiple-choice answer options covered by their index cards.

**Step 4:** Ms. Soto will build students’ background knowledge. It is well documented that background knowledge is a significant contributor to inference generation (Ahmed et al., 2016), and thus it is frequently helpful for teachers to build students’ background knowledge as well as teach them to activate it in order to support inference generation. As Currie and Cain (2015) write, “one cannot infer that a furry animal that barks and likes going for walks is a dog unless one possesses the requisite knowledge about dogs and their characteristics” (p. 59). One of the best ways for Ms. Soto to build students’ background knowledge and enable her students to practice activating this background knowledge is by providing opportunities to read multiple texts across genres and perspectives that touch on the same topic. When reading the book *Wonder* (Palacio, 2012), which takes place in New York City and in which the protagonist is a boy with a craniofacial anomaly resulting from his inheritance of two recessive genes, Ms. Soto might give students opportunities to read short stories that take place in New York City or to read articles in kids’ science magazines about genetic disorders and/or heredity.

**Future Lessons: Teaching Students How to Make Inferences**

**Step 5:** For each subsequent inference instruction lessons, Ms. Soto will incorporate the following components (refer to Figure 3 for a sample lesson script). She will

- Provide explicit instruction in generating specific types of text-connecting and knowledge-based inferences.
- Name the kind of inference that is the focus of instruction (this provides the student with declarative knowledge).
- Explain in step-by-step fashion how to make this kind of inference (this provides the student with procedural knowledge).
- Describe *when* it makes sense to make this kind of inference (this provides the student with conditional knowledge).
- Model making this type of inference while reading a section of text by thinking aloud.
- Provide opportunities for guided practice combined with teacher corrective feedback. Feedback should include teacher explanation and thinking aloud that models accurate inference making rather than only an assessment of right or wrong. Students should also receive opportunities to think aloud, articulating why/how they made an inference, and why/how they made a correction to their inference process (Pashler et al., 2007).

**Question Sheet for Chapter 4: Driving**

1. Auggie asks, "Did you tell him anything else?" What, in particular, do you think Auggie wonders about?
  - a. Did his mom tell Mr. Tushman about the way Auggie's face looks?
  - b. Did his mom tell Mr. Tushman that Auggie didn't want to go to school?
  - c. Did his mom tell Mr. Tushman that Auggie's family wasn't rich?
  - d. Did his mom tell Mr. Tushman that Auggie's sister was Via?
  
2. "We showed him pictures of the whole family. And that great shot of you holding that flounder on the boat!" A flounder is probably a:
  - a. Fish
  - b. Pencil
  - c. Paintbrush
  - d. Calculator
  
3. "Last year? ...So you've been thinking about this for a whole year and you didn't tell me?" Auggie asks his parents. How do you think Auggie feels?
  - a. Angry, betrayed
  - b. Relieved
  - c. Surprised, bewildered
  - d. Happy
  
4. "Last year? ...So you've been thinking about this for a whole year and you didn't tell me?" What does this refer to?
  - a. The idea of sending Auggie to middle school
  - b. The idea of visiting Christopher
  - c. The way Auggie's face looks
  - d. The trip to Montauk

**Figure 2.** Sample Inference Instruction Question Sheet.

- Provide opportunities for independent practice reading and answering inferential questions in small groups.

If students are having difficulty understanding the ingredients of a knowledge-based inference, Ms. Soto can scaffold their understanding by using graphic organizers that make visible the gaps in text for which students must supply missing background knowledge and the way in which both the reader's knowledge and information from the text contribute to an inference (Elbro & Buch-Iversen, 2013). For more research supporting the use of graphic organizers in instruction for students with LD, see Dexter and Hughes (2011) and Kim, Vaughn, Wanzek, and Wei (2004). Figure 4 represents an example of a graphic organizer that Ms. Soto could use during inference instruction. When introducing graphic organizers, Ms. Soto will first use oral language or visual scenarios. For example, she might show them an illustration from a wordless book like *The Lion & the Mouse* (Pinkney, 2009). One page depicts an owl, swooping down from above, and a mouse dashing into a hole in a hollow log. Displaying this page, Ms. Soto can model for students how she brainstorms what she already knows about mice and owls and combines this knowledge with what she sees on the page to make an inference: The mouse is running away because he's afraid the owl will eat him. Once students are proficient at filling in the "information from text," "information from the reader," and "inference" graphic organizer boxes, Ms.

Soto will guide students in using graphic organizers to generate inferences while reading text. Graphic organizers may be particularly helpful for teaching students to make inferences in informational text, which require students to frequently activate prior knowledge in order to make inferences. Graphic organizers used with informational text will help Ms. Soto keep track of prior knowledge that students do not have so that she can explicitly build this knowledge.

After she provides explicit instruction and models making an inference of a particular type, Ms. Soto will give students opportunities for guided practice, making this inference type while she listens and provides corrective feedback. During the independent practice portion of instruction, Ms. Soto will instruct students to read with a partner or in a small group, stopping at specific points to read and discuss inference questions, as described in Step 2. She will again provide immediate corrective feedback when students submit answers to questions. One way to do this is by means of a scratch-off answer sheet (e.g., Immediate Feedback Assessment Technique forms; Smith, 2013).

## Conclusion

Skill in generating inferences is critical to the reading comprehension of students in the upper elementary grades, and inference making is a key focus of the Common Core State Standards (National Governors Association, 2010).

### Lesson 3: Readers Make Inferences About Pronoun Referents

1. **Review:** Yesterday, we practiced making inferences about characters. Based on her actions, we inferred that Auggie's sister Via was bold, fierce in her loyalty to Auggie.
2. **Teach:** Today, we're focusing on a different kind of inference: inferences around pronouns. Pronouns, as you know, are words like "he," "she" or "them" (or "this" or "that"). They refer to another word ("she" might refer to [supply name of a student], for example). When we read, we have to connect pronouns with the words they refer to. It's easy to turn your brain off and keep reading right past pronouns without even thinking about them (they're such small, seemingly unimportant words, after all!). But sometimes they're really important words.
3. **Model:** Let me show you an example. In this third paragraph, Auggie's mom whispers to Auggie's dad, "We can't just pretend he's going to wake up tomorrow and this isn't going to be his reality, because it is, Nate, and we have to help him learn to deal with it. This? It? I'm going to make myself think: what does "this" refer to? First, let me re-read. So "this" is Auggie's reality, something that he'll definitely wake up with tomorrow. I'm inferring "this" is the way he looks? Let me substitute "the way he looks" for "this": "We can't just pretend he's going to wake up tomorrow and the way he looks isn't going to be his reality, because it is, Nate..." Okay, I think that works!
4. **Guided Practice:** Let's try another one. [Provide another example.] Who does [pronoun] refer to in this sentence? Ask students what clues in the text they used to make the inference. Ask students to substitute the inferred referent for the pronoun and read the sentence aloud.
5. **Independent Practice.**

Figure 3. Sample Inference Instruction Lesson Script.

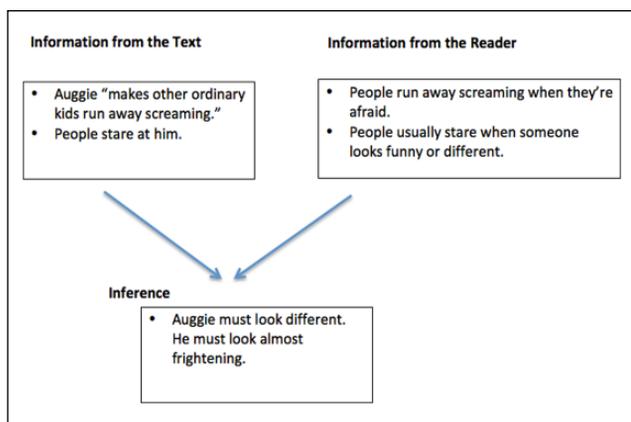


Figure 4. Example Graphic Organizer for Use During Inference Instruction. The inference displayed in this graphic organizer was generated while reading *Wonder* (Palacio, 2012).

Students with LD have particular difficulty making inferences, but they also have more to gain than typically developing students from explicit inference instruction (Hall, 2015). For these reasons, it is tremendously important to teach struggling readers in the upper elementary grades how to generate text-connecting and knowledge-based inferences. Teachers can do this by following the steps laid out above:

- choose a text;
- mark stopping points, keeping in mind what you know about places in text where it's necessary for readers to make inferences;
- define "inference" and introduce the daily reading and question-answering routine;
- build students' background knowledge related to the topic of the text; and
- provide explicit instruction, including declarative, procedural, and conditional knowledge, in generating

specific types of text-connecting and knowledge-based inferences, with a reduction in the time spent asking students to generate predictive knowledge-based inferences.

Explicit inference instruction can incorporate the same components used in explicit reading comprehension strategy instruction more generally, including teacher modeling via think-alouds, opportunities for both guided practice and independent practice with immediate corrective feedback. Given access to these types of teaching and instructional supports, struggling readers can reap tremendous benefits from inference instruction.

### Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

### Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: The research reported here was supported by the Institute of Education Sciences, U.S. Department of Education, through Grant R305F100013 to the University of Texas at Austin as part of the Reading for Understanding Research Initiative. The opinions expressed are those of the authors and do not represent views of the Institute or the U.S. Department of Education.

### Note

1. The situation described in the vignettes is a fictionalized account drawn from several authentic situations and put together as an aggregated scenario.

### References

- Ahmed, Y., Francis, D. J., York, M., Fletcher, J. M., Barnes, M., & Kulesz, P. (2016). Validation of the direct and inferential mediation (DIME) model of reading comprehension in grades 7 through 12. *Contemporary Educational Psychology, 44*, 68–82.

- Barnes, M. A., Ahmed, Y., Barth, A., & Francis, D. J. (2015). The relation of knowledge-text integration processes and reading comprehension in seventh to twelfth grade students. *Scientific Studies of Reading, 19*, 253–272.
- Barth, A., Barnes, M. A., Francis, D., York, M., & Vaughn, S. (2015). Bridging inferences among adequate and struggling adolescent comprehenders and relations to reading comprehension. *Reading and Writing, 28*(5), 587–609.
- Biancarosa, G., & Snow, C. E. (2006). *Reading next: A vision for action and research in middle and high school literacy. A report to Carnegie Corporation of New York*. Washington, DC: Alliance for Excellent Education.
- Bowyer-Crane, C., & Snowling, M. J. (2005). Assessing children's inference generation: What do tests of reading comprehension measure? *British Journal of Educational Psychology, 75*, 189–201.
- Cain, K., Oakhill, J., & Lemmon, K. (2004). Individual differences in the inference of word meanings from context: The influence of reading comprehension, vocabulary knowledge, and memory capacity. *Journal of Educational Psychology, 96*(4), 671–681.
- Cain, K., Oakhill, J. V., & Bryant, P. E. (2004). Children's reading comprehension ability: Concurrent prediction by working memory, verbal ability, and component skill. *Journal of Educational Psychology, 96*(1), 31–42.
- Cromley, J. G., & Azevedo, R. (2007). Testing and refining the direct and inferential mediation model of reading comprehension. *Journal of Educational Psychology, 99*(2), 311–325.
- Currie, N. K., & Cain, K. (2015). Children's inference generation: The role of vocabulary and working memory. *Journal of Experimental Child Psychology, 137*, 57–75.
- Denton, C. A., Enos, M., York, M. J., Francis, D. J., Barnes, M. A., Kulesz, P. A., . . . Carter, S. (2015). Text processing differences in adolescent adequate and poor comprehenders reading accessible and challenging narrative and informational text. *Reading Research Quarterly*. Advance online publication.
- Dexter, D. D., & Hughes, C. A. (2011). Graphic organizers and students with learning disabilities: A meta-analysis. *Learning Disability Quarterly, 34*(1), 51–72.
- Elbro, C., & Buch-Iversen, I. (2013). Activation of background knowledge for inference making: Effects on reading comprehension. *Scientific Studies of Reading, 17*, 435–452.
- Faggella-Luby, M. N., & Deshler, D. D. (2008). Reading comprehension in adolescents with LD: What we know; what we need to learn. *Learning Disabilities Research & Practice, 23*(2), 70–78.
- Hall, C. (2015). Inference instruction for struggling readers: A synthesis of intervention research. *Educational Psychology Review*. Advance online publication.
- Hall, C. (2016, July). *The effects of an inference instruction intervention on the inference generation and reading comprehension of struggling readers in grades 6 and 7*. Paper presented at the Training and Support for Text Comprehension symposium at the meeting of the Society for the Scientific Study of Reading, Porto, Portugal.
- Hansen, J., & Pearson, P. D. (1983). An instructional study: Improving the inferential comprehension of good and poor fourth-grade readers. *Journal of Educational Psychology, 75*(6), 821–829.
- Kendeou, P., Bohn-Gettler, C., White, M., & van den Broek, P. (2008). Children's inference generation across different media. *Journal of Research in Reading, 31*, 259–272.
- Kim, A. H., Vaughn, S., Wanzek, J., & Wei, S. (2004). Graphic organizers and their effects on the reading comprehension of students with LD: A synthesis of research. *Journal of Learning Disabilities, 37*(2), 105–118.
- Kintsch, W., & van Dijk, T. A. (1978). Towards a model of text comprehension and production. *Psychological Review, 85*, 363–394.
- McKoon, G., & Ratcliff, R. (1992). Inference during reading. *Psychological Review, 99*(3), 440–466.
- McMaster, K. L., van den Broek, P., Espin, C. A., White, M. J., Rapp, D. N., Kendeou, P., . . . Carlson, S. (2012). Making the right connections: Differential effects of reading intervention for subgroups of comprehenders. *Learning and Individual Differences, 22*, 100–111.
- National Governors Association Center for Best Practices, Council of Chief State School Officers. (2010). *Common Core State Standards for English language arts*. Washington, DC: Author.
- Palacio, R. J. (2012). *Wonder*. New York, NY: Knopf.
- Pashler, H., Bain, P., Bottge, B., Graesser, A., Koedinger, K., McDaniel, M., & Metcalfe, J. (2007). *Organizing instruction and study to improve student learning* (NCER 2007-2004). Washington, DC: National Center for Education Research, Institute of Education Sciences, U.S. Department of Education. Retrieved from <http://ncer.ed.gov>
- Pinkney, J. (2009). *The Lion & the Mouse*. New York, NY: Little, Brown.
- Rapp, D. N., van den Broek, P., McMaster, K. L., Kendeou, P., & Espin, C. A. (2007). Higher-order comprehension processes in struggling readers: A perspective for research and intervention. *Scientific Studies of Reading, 11*(4), 289–312.
- Smith, J. A. (2013). Immediate Feedback and Assessment Technique (IF-AT) testing forms: An overview of the tool and uses. *Developments in Business Simulation and Experiential Learning, 40*, 107–109.
- Stafura, J. Z., & Perfetti, C. A. (2015). Comprehending implicit meanings in text without making inferences. In E. J. O'Brien, A. E. Cook, & R. F. Lorch (Eds.), *Inferences during reading* (pp. 16–33). Cambridge, UK: Cambridge University Press.
- van den Broek, P., Beker, K., & Oudega, M. (2015). Inference generation in text comprehension: Automatic and strategic processes in the construction of a mental representation. In E. J. O'Brien, A. E. Cook, & R. F. Lorch (Eds.), *Inferences during reading* (pp. 109–136). Cambridge, UK: Cambridge University Press.
- Yuill, N., & Oakhill, J. (1988). Effects of inference awareness training on poor reading comprehension. *Applied Cognitive Psychology, 2*, 33–45.