EXPLORING INFORMATIONAL TEXT COMPREHENSION: READING BIOGRAPHY, PERSUASIVE TEXT, AND PROCEDURAL TEXT IN THE ELEMENTARY GRADES

By

Nicole M. Martin

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Curriculum, Instruction, and Teacher Education

2011

ABSTRACT

EXPLORING INFORMATIONAL TEXT COMPREHENSION: READING BIOGRAPHY, PERSUASIVE TEXT, AND PROCEDURAL TEXT IN THE ELEMENTARY GRADES

By

Nicole M. Martin

This dissertation includes two manuscripts. Both manuscripts focus on the same cross-sectional descriptive research study, which explored students' comprehension of three types of informational texts. The study addressed two research questions: (1) How, if at all, does students' comprehension differ for three types of informational text (biography, persuasive text, and procedural text)? and (2) Within each informational genre, how, if at all, does students' comprehension differ by grade level?

Participants were 40 second- through fifth-grade students. Drawn from 20 different classrooms and many different schools and districts, all participants were considered on-grade-level readers by their teachers and tended to provide evidence of low levels of previous knowledge about the featured task, topics, and genres.

The elementary students completed a verbal protocol training task, participated in concurrent verbal protocols, and answered questions about their background knowledge. Participants read one biography, one persuasive text, and one procedural text in counterbalanced order on different days. They reported their use of processes before, during, and after they read. Participants' reported use of processes and responses to background questions were transcribed, coded, and analyzed. I calculated descriptive and inferential statistics. I compared and contrasted participants' reports and responses by grade level, genre, and grade level by genre. Results suggested that participants' comprehension approaches differed significantly by genre

and grade level. Their reported use of processes differed between (a) second and third through fifth grades and (b) procedural texts and biography and persuasive texts. The elementary on-grade-level readers appeared to use different approaches to comprehending informational texts before third grade and with at least one of the three focal types of informational texts.

The first manuscript is written for researchers. The manuscript describes the study's rationale, background, design, methods, materials, results, implications, limitations, and contributions.

The second manuscript is written for teachers, reading specialists, and other practitioners. Although the manuscript also provides information about the study background and results, the primary focus is on the study's practical implications.

This dissertation study contributes to the growing literature on genre-specific reading comprehension. It extends previous research by featuring younger grade levels reading multiple types of informational texts. In addition, practical suggestions for aligning instruction and assessment with elementary on-grade-level readers' reported use of processes for comprehending biography, persuasive texts, and procedural texts are provided.

ACKNOWLEDGEMENTS

This dissertation marks the end of a long journey. I would like to thank the many people who supported me throughout this process and equipped me well for my next voyage.

First and foremost, I would like to express my gratitude to my dissertation director and advisor, Dr. Nell Duke. I cannot begin to count the number of lessons I have learned from her about high-quality research, outstanding mentoring, zealous service, and exceptional writing. She also taught me one of the greatest lessons of my life: how to envision and achieve your dreams. She has my deepest thanks for showing me the way and teaching me so much about scholarship, teaching, and service.

I would also like to thank my committee members, Dr. Carol Sue Englert, Dr. Douglas Hartman, Dr. Mary Juzwik, and Dr. Janine Certo, as well as Dr. Pat Edwards and Dr. Cheryl Rosaen. Their questions, comments, and guidance continually challenged me to think and grow as a literacy researcher and leader.

In addition, I would like to thank Lynne Watanabe, Dr. Kate Roberts, Dr. Rebecca Norman, Dr. Meagan Shedd, Lauren Fingeret, Jen Knight, and Meghan Block for providing feedback, sharing experiences, and offering their expertise at each stage of this study.

Lastly, I would like to tell my family how much I appreciate their assistance. Knowing that I could count on their love and support allowed me to get through even the most difficult parts of the dissertation process.

As I think about all the people who have helped me along the way, one of my favorite poems comes to mind. Durica (2007) writes: "It seems the key to helping kids / To go beyond their reach / Is to care for them, and know your stuff, and *love* what it is you teach!" (p. 82). Like the child narrator in this poem, I feel as if I have had the extreme good fortune to be

surrounded with “teachers” who care about mentoring graduate students, who know their “stuff,” and who love what they do. I have been, and continue to be, inspired by their daily example of what it means to be passionate about literacy, research, and leadership. Thank you for everything!

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Introduction

Students must learn to comprehend informational text to be successful in school and adulthood. They may encounter informational texts in reading and across the content areas, and they may need to read procedural texts (e.g., game directions, computer manuals, cooking recipes), exposition (e.g., informational websites, product reviews), and many other types of informational text to accomplish their personal and social goals. Contemporary educational reforms and resources require students to read informational texts (e.g., National Assessment Governing Board [NAGB], 2008; National Governors Association & Council of Chief State School Officers [NGA & CCSSO], 2010). Adults also spend significant chunks of time reading and writing informational texts (e.g., Smith, 2000; White, Chen, & Forsyth, 2010), which means that students must learn to comprehend informational texts to accomplish their adult goals.

I have spent the last five years studying and promoting elementary and middle school students' abilities to read informational texts. My research has focused on three lines of inquiry: exploring young children's informational text comprehension and development (e.g., Billman, et al., 2007; Duke, et al., in preparation), increasing students' ability to use learning-to-learn literacy strategies in science and social studies classes (e.g., Englert et al., 2007; Englert et al., 2008), and investigating teachers' literacy and genre conceptions (e.g., Martin, 2010; Martin, under review). I have also reviewed other researchers' informational text comprehension interventions (Martin, 2011; Martin & Duke, 2010).

During the course of my doctoral program, I have noticed that the constructs of reading and comprehension have become increasingly complex in the last two decades – from the Simple to the More Complex View of Reading (e.g., Catts, Adlof, & Weismer, 2006; Hoover & Gough, 1990; Pressley, et al., 2009) and from a unified to a genre-specific view of reading

comprehension (Duke, 2005; Duke & Roberts, 2010; Robinson, Faraone, Hittleman, & Unruh, 1990). These more complex views of reading and comprehension also seem to have begun informing the arena of elementary education. Encouraging practitioners to differentiate their comprehension instruction accordingly seems wise because evidence has consistently revealed differences in readers' narrative and informational text comprehension (e.g., Langer, 1986; Olson, Mack, & Duffy, 1981). Learning standards, assessments, and classroom resources now frequently assume that teachers will focus on students' ability to read two types of text: narrative and informational texts (Buss & Karnowski, 2000, 2002; NAGB, 2008; NGA & CCSSO, 2010).

Yet, informational text itself is often portrayed as inclusive of multiple modes and genres, such as *exposition*, *argumentation and persuasive text*, and *procedural text and documents* (NAGB, 2008, p. 9). Just as the purposes and characteristics of narrative texts may differ from informational texts, the purposes and characteristics of different types of informational texts may also vary. (For more information about the purposes and characteristics of different types of informational texts, see Mooney, 2001; or NAGB, 2008). Just as there is narrative and informational text comprehension, identifying multiple types of text as informational implies that the latter may also involve using more than one set of comprehension processes.

As I became aware of the inclusive definition of informational texts and learned about genre-specific reading comprehension, I began to wonder how these two constructs intersected – particularly for the elementary students whom I had taught. For example, does informational text comprehension entail a unitary set of processes regardless of the type of informational text being read? Do elementary readers approach various informational genres differently? Does the comprehension of different types of informational text develop differently? I wanted to learn about the intersections between informational text and comprehension in the elementary grades.

Overview of the Dissertation

This dissertation study begins to address some of my questions about informational text comprehension. As you will see in the next pages, I asked elementary readers in the United States to teach me about the construct. The students read different types of informational text and told me what they were thinking. I analyzed their reported use of processes to see whether on-grade-level readers used similar or different approaches to comprehend multiple types of informational text.

I used an alternative format to report the results of my dissertation study (Duke & Beck, 1999): two journal-length manuscripts. The first manuscript has been written for researchers. Using the format of a traditional report of research, I discuss the study rationale; summarize the research and theory framing the study; review the research design, methods, and materials; describe and interpret the results; and explore the study implications, limitations, and contributions. The second manuscript has been written for teachers, reading specialists, and other practitioners. Following the format of previously-published work (e.g., Donovan & Smolkin, 2011; Duke, Purcell-Gates, Hall, & Tower, 2006/2007), I focus on the practical implications of the study. The second manuscript introduces the topic, summarizes the study results, and offers suggestions for translating the study implications into practice.

The study featured in both of these manuscripts addressed two research questions: *How, if at all, does students' comprehension differ for three types of informational text (biography, persuasive text, and procedural text)?* and *Within each informational genre, how, if at all, does students' comprehension differ by grade level?*. Because elementary students' reported uses of comprehension processes have rarely, if ever, been explored with multiple types of informational text, I wanted to gather information about typically-developing readers in real elementary

classrooms. The study focused on on-grade-level elementary readers from many different classrooms. The final sample included 40 second- through fifth-grade students. Two students each from twenty classrooms (5 per grade level) participated. The classrooms were located in different contexts: multiple schools, districts, neighborhoods, and states. Students' racial or ethnic and socioeconomic backgrounds differed. However, all students were rated by their teachers as reading on-grade-level. They also tended to report low levels of knowledge when they responded to background questions about the focal task, topics, and genres.

I used concurrent verbal protocols to gather reports of comprehension processes. The elementary students read three texts, one per day, in counter-balanced order. They reported their use of processes before, during, and after each reading. I used open-ended questions and physical prompts (red star stickers) after each paragraph or step to remind them to share their thinking. All students had the opportunity to practice thinking aloud during a verbal protocol training task, and they answered questions about their background experiences at the end of each session. I transcribed students' responses and reports and used a priori and emergent codes to code different ideas. Then I developed individual records of students' responses to background questions and reported uses of processes, as well as calculated descriptive and inferential statistics. To identify similarities and differences, I compared and contrasted students' responses and reports by grade level, by genre, and by grade level by genre.

Results suggested that students' uses of processes differed at a level of statistical significance according to grade level and genre. Students' reported uses of processes differed between (a) second and third through fifth grades and (b) procedural texts and biography and persuasive texts. I concluded from this evidence that elementary on-grade-level readers (a)

exhibit noncontinuous growth in their informational text comprehension development and (b) appear to use more than one approach to comprehend different types of informational text.

The study results support the hypothesis that reading comprehension may differ by type of text: elementary students appear to use more than one approach to comprehend biography, persuasive text, and procedural text. The study extends research into genre-specific comprehension to elementary on-grade-level readers' comprehension of multiple informational genres. Previous research has examined students' comprehension of narrative texts and exposition (e.g., Langer, 1986; Stein & Glenn, 1979), and a few studies have examined their comprehension of other types of informational text (e.g., Brassart, 1996; Purcell-Gates, Duke, & Martineau, 2007). To my knowledge, no one else has explored how the same second- through fifth-grade students comprehend biography, persuasive text, and procedural text.

Students' reported use of processes hold important implications for research and practice. Current reforms require elementary students to read different types of informational texts (e.g., NAGB, 2008; NGA & CCSSO, 2010), and the study results suggest that on-grade-level readers are not likely to use the same approach to comprehend all of the mandated informational genres. Researchers who investigate on-grade-level elementary students' informational text comprehension may need to be more sensitive to the role of genre when they select texts, explore students' knowledge and skills, and develop interventions. Similarly, teachers who teach students to comprehend informational texts may need to align their instructional practices with elementary readers' non-unitary comprehension approaches. Because this study established baseline patterns for four grade levels and three informational genres, researchers and teachers can also use the on-grade-level elementary students' reported uses of processes to inform future informational text comprehension study and teaching.

References

References

Billman, A. K., Duke, N. K., Katherine, H., Zhang, S., Roberts, K., Halladay, J., et al. (2007). Concepts of comprehension assessment. East Lansing: Trustees of Michigan State University. (Available from LARC, see http://msularc.educ.msu.edu/coca-materials for further information.).

Brassart, D. G. (1996). Does a prototypical argumentative schema exist? Text recall in 8 to 13 year olds. *Argumentation, 10*, 163-174. Retrieved from http://www.springer.com/philosophy/logic+and+philosophy+of+language/journal/10503

Buss, K., & Karnowski, L. (2000). *Reading and writing literary genres*. Newark, DE: International Reading Association.

Buss, K., & Karnowski, L. (2002). *Reading and writing nonfiction genres*. Newark, DE: International Reading Association.

Catts, H. W., Adlof, S. M., & Weismer, S. E. (2006). Language deficits in poor comprehenders: A case for the simple view of reading. *Journal of Speech, Language, and Hearing Research, 49*, 278-293. doi:10.1044/1092-4388(2006/023)

Donovan, C. A., & Smolkin, L. B. (2011). Supporting informational writing in the elementary grades. *The Reading Teacher, 64*, 406-416. doi: 10.1598/RT.64.6.2

Duke, N. K. (2005). Comprehension of what for what: Comprehension as a non-unitary construct. In S. Paris & S. Stahl (Eds.), *Current issues in reading comprehension and assessment* (pp. 93-104). Mahwah, NJ: Erlbaum.

Duke, N. K., & Beck, S. W. (1999). Education should consider alternative formats for the dissertation. *Educational Researcher, 28*(3), 31-36. Retrieved from http://aer.sagepub.com/

Duke, N. K., Norman, R. R., Roberts, K. L., Martin, N. M., Knight, J. A., Morsink, P. M., et al. (in preparation). *Visual literacy development in young children: An investigation with informational texts*.

Duke, N. K., Purcell-Gates, V., Hall, L. A., & Tower, C. (2006/2007). Authentic literacy activities for developing comprehension and writing. *The Reading Teacher, 60*, 344-355. Retrieved from http://www.reading.org/General/Publications/Journals/RT.aspx

Duke, N. K., & Roberts, K. M. (2010). The genre-specific nature of reading comprehension. In D. Wyse, R. Andrews & J. Hoffman (Eds.), *The Routledge international handbook of English language and literacy teaching* (pp. 74-86). London: Routledge.

Englert, C. S., Mariage, T., Okolo, C., Chen, H. S., Courtad, C. A., Martin, N. M., et al. (2007, November). *Project ACCEL: The metacognitive knowledge and performance abilities of*

middle school students about content literacy strategies or "Then what do you do?" Paper presented at the meeting of the National Reading Conference, Austin, TX.

Englert, C. S., Mariage, T. V., Okolo, C. M., Shankland, R. K., Moxley, K. D., Courtad, C. A., et al. (2008). The learning-to-learn strategies of adolescent students with disabilities: Highlighting, notetaking, planning, and writing expository texts. *Assessment for Effective Intervention*. doi: 1534508408318804

Hoover, W. A., & Gough, P. B. (1990). The simple view of reading. *Reading and Writing, 2*, 127-160. doi: 10.1007/BF00401799

Langer, J. A. (1986). *Children reading and writing: Structures and strategies*. Norwood, NJ: Ablex Publishing.

Martin, N. M. (2010, April). *Supporting children's NAEP achievement: Primary teachers' genre conceptions*. Paper presented at the meeting of the American Educational Research Association, Denver, CO.

Martin, N. M. (2011, April). *Investigating the value of research on teaching elementary informational text comprehension: A methodological literature review*. Paper presented at the meeting of the American Educational Research Association, New Orleans, LA.

Martin, N. M. (under review). *'Historical nonfiction' and 'fantasy fact': Exploring primary teachers' conceptions of informational genres.*

Martin, N. M., & Duke, N. K. (2010). Interventions to enhance informational text comprehension. In R. Allington & A. McGill-Franzen (Eds.), *Handbook of reading disabilities research* (pp. 345-361). New York: Routledge.

Mooney, M. E. (2001). *Text forms and features: A resource for intentional teaching*. Katonah, NY: Richard C. Owen Publishers.

National Assessment Governing Board. (2008). *Reading framework for the 2009 National Assessment of Educational Progress.* Retrieved from http://www.nagb.org/publications/frameworks/reading09.pdf

National Governors Association & Council of Chief State School Officers. (2010). *Common core state standards for English Language Arts & literacy in history/social studies, science, and technical subjects*. Retrieved from http://www.corestandards.org/the-standards/english-language-arts-standards

Olson, G. M., Mack, R. L., & Duffy, S. A. (1981). Cognitive aspects of genre. *Poetics, 10*, 283-315. Retrieved from http://www.elsevier.com/wps/find/journaldescription.cws_home/505592/description#description

Pressley, M., Duke, N. K., Gaskins, I. W., Fingeret, L., Halladay, J., Hilden, K., et al. (2009). Working with struggling readers: Why we must get beyond the Simple View of Reading and visions of how it might be done. In T. B. Gutkin & C. R. Reynolds (Eds.), *The handbook of school psychology* (4th ed., pp. 522-546). Hoboken, NJ: Wiley.

Purcell-Gates, V., Duke, N., & Martineau, J. A. (2007). Learning to read and write genre-specific text: Roles of authentic experience and explicit teaching. *Reading Research Quarterly, 42*, 8-45. doi: 10.1598/RRQ.42.1.1

Robinson, H. A., Faraone, V., Hittleman, D. R., & Unruh, E. (1990). *Reading comprehension instruction 1783-1987: A review of trends and research*. Newark, DE: International Reading Association.

Smith, M. C. (2000). The real-world reading practices of adults. *Journal of Literacy Research, 32*, 25-52. doi: 10.1080/10862960009548063

Stein, N. L., & Glenn, C. G. (1979). An analysis of story comprehension in elementary school children. In R. O. Freedle (Ed.), *New directions in discourse processing* (pp. 53-120). Norwood, New Jersey: Ablex.

White, S., Chen, J., & Forsyth, B. (2010). Reading-related literacy activities of American adults: Time spent, task types, and cognitive skills used. *Journal of Literacy Research, 42*, 276-307. doi: 10.1080/1086296X.2010.503552

MANUSCRIPT ONE: ELEMENTARY STUDENTS' INFORMATIONAL COMPREHENSION PROCESSES: EXPLORING READING OF BIOGRAPHY, PERSUASIVE AND PROCEDURAL TEXT

Abstract

Many children struggle to comprehend informational texts, and more information is needed about how elementary students read informational texts. This study examined whether elementary students use different approaches to comprehend different kinds of informational texts. Two research questions were addressed: (1) How, if at all, does students' comprehension differ for three types of informational text (biography, persuasive text, and procedural text)? and (2) Within each informational genre, how, if at all, does students' comprehension differ by grade level? Forty second- through fifth-grade on-grade-level readers read biography, persuasive texts, and procedural texts. Students' verbal protocol reports and interview responses were collected, coded, and compared by genre and grade level. Students' use of processes differed between second and third through fifth grade, as well as between procedural texts and the other two genres (biography and persuasive texts). Study results may extend current conversations about comprehension and genre and inform future instructional practices.

Elementary Students' Informational Comprehension Processes: Exploring Reading of Biography, Persuasive and Procedural Text

Educational leaders and researchers have long identified students' comprehension of informational texts as a concern in the United States (e.g., Caswell & Duke, 1998; Chall, Jacobs, & Baldwin, 1990; Hidi & Hildyard, 1983). Informational texts are written discourses designed to share information, teach skills, and convince, and U.S. elementary students are expected to read them increasingly often from fourth grade into adulthood (National Center for Education Statistics, 2007; Venezky, 2000). Content area trade books, textbooks, websites, and other informational texts are ubiquitous in and out of school, yet U.S. elementary students persistently score at non-proficient levels on large-scale assessments (e.g., Lee, Grigg, & Donahue, 2007; Mullis, Martin, Kennedy, & Foy, 2007; Park, 2008). Despite educational research and reform, informational text comprehension remains a challenge for many U.S. elementary students.

Contemporary views of reading comprehension may partly explain U.S. elementary students' difficulties. Converging evidence that readers use different approaches to comprehend narrative and informational texts suggests reading comprehension may be genre-specific (Duke, 2005; Duke & Roberts, 2010). Because the purpose and characteristics of informational texts vary extensively, comprehending them may involve adopting more than one approach – suggesting that future research and reform may need to focus on differentiated comprehension instructional methods. However, the possibility that U.S. students' comprehension differs across informational genres has yet to be thoroughly investigated, and their comprehension of many informational genres remains understudied.

To fill the gap, this study explored U.S. elementary students' comprehension processes for multiple informational genres. The following research questions were addressed:

(1) How, if at all, does students' comprehension differ for three types of informational text (biography, persuasive text, and procedural text)?

(2) Within each informational genre, how, if at all, does students' comprehension differ by grade level?

Theoretical Framework and Literature Review

This study proceeds from a sociocognitive perspective that draws upon constructivism, social constructivism, and information/cognitive processing theory. It is informed by a body of research and theory on reading comprehension, genre, informational texts in elementary schools, and children's literacy development.

Reading Comprehension

Text comprehension involves a transaction between the reader and writer (Rosenblatt, 1994). According to the RAND Reading Study Group (2002), reading comprehension is "the process of simultaneously extracting and constructing meaning through interaction and involvement with written language" (p. xiii). Readers retrieve the meanings of local text units, build models of the global text's meaning, and implicate their own worldviews and sociohistorical experiences to make meaning of the written text.

During this process, the reader, activity, sociocultural context, and text influence reading comprehension (RAND Reading Study Group, 2002). Readers use schemata or individualized knowledge structures of reading processes, texts, and the world, and they may or may not have the needed schemata to comprehend particular texts (Anderson & Pearson, 1984; Baker & Stein, 1981; Stein & Glenn, 1979). The reading activity and sociocultural context may also shape readers' reading goals, attention, and mental processes, as well as provide (or not provide) adults and more advanced peers who can communicate their knowledge and arrange learning contexts

that enable developing readers to gradually internalize and use publicized knowledge (Au, 1997; RAND Reading Study Group, 2002; Ruddell & Unrau, 1994; Vygotsky, 1978, 1993). Finally, the text affects readers' comprehension. When writers compose texts to achieve goals, they make decisions about organization, language, and other text elements that may support or constrain readers' comprehension.

Genre

Writers with similar goals tend to respond similarly when choosing how to compose specific texts, and they are heavily influenced by previously-encountered texts and the choices that past writers have made (e.g., Bakhtin, 1986; Miller, 1984). The conventions established by preceding writers and texts contribute to their tendency toward repeatedly making the same choices when faced with the same goals; writers' repeated decisions lead to consistent similarities and differences among texts, producing distinct genres of text (e.g., Askehave & Swales, 2001; Miller, 1984).

"Genre" has been defined in various ways throughout history (e.g., Dubrow, 1982; Bawarshi & Reiff, 2010). Theoretical perspectives on genre have variously identified the text's form or its surrounding context as the primary determinant of genre. For the purposes of this study, I define genre as "a distinctive profile of regularities across four dimensions: a set of texts, the composing processes involved in creating these texts, the reading practices used to interpret them, and the social roles performed by writers and readers" (Paré & Smart, 1994, p. 147).

This view of genre recognizes the situated nature of genre. It acknowledges that a complex interplay of multiple factors produce genres, rather than conceptualizing their origin as a sole product of either the social context or the texts' final forms. Readers' and writers' purposes drive their reading and writing processes, and the text characteristics associated with

specific genres follow from their pursuit of similar goals in similar social contexts (e.g., Bazerman, 1988; Paré & Smart, 1994). Because genres result from interactions among the text, context, reader, and writer, they are stable but also subject to change (Flowerdew, 2002; Miller, 1984). New genres may arise, and older genres may evolve or fall out of everyday use. Also, texts can vary in their resemblances to particular genres. Writers may, for example, combine multiple genres to accomplish their goals and produce hybrid texts that exhibit a blend of genre-typical characteristics.

I focused on genre in this study for three reasons. First, the connection between genre and reading comprehension has been widely acknowledged (if not yet fully articulated). For example, the RAND Reading Study Group (2002) argues that mismatches between the text's genre (and other text factors) and readers' schemata or experiences may inhibit comprehension. Second, genre is one way in U.S. elementary state standards, high-stakes tests, and classroom resources conceptualize texts (cf., Buss & Karnowski, 2002; National Assessment Governing Board [NAGB], 2008). Third, many other researchers have used a genre lens when studying elementary students' comprehension processes and development (e.g., Kucan & Beck, 1996; Purcell-Gates, Duke, & Martineau, 2007). Following this precedent enabled me to connect the study to the existing knowledge base and build on other researchers' work.

Genre-Specific Reading Comprehension

As mentioned previously, the RAND Reading Study Group (2002) acknowledges that genre may play a role in comprehension. Accumulating evidence suggests that readers' comprehension processes differ significantly for narrative and informational texts (e.g., Kucan & Beck, 1996; Langer, 1986; Olson, Mack, & Duffy, 1981). For example, with narrative texts or stories, readers tend to adopt prospective perspectives that include making predictions and

inferences, and they identify globally-important ideas in their retellings. In contrast, readers use retrospective perspectives, such as elaborating and making connections, and focus on local information when reading and recalling informational texts. Even emergent readers differentiate between narrative and informational texts (Duke & Kays, 1998; Pappas, 1991, 1993). For instance, kindergartners included past tense verbs, identity chains (e.g., *he—the squirrel)*, and certain text structures (e.g., initiating event, sequent event, and final event) when they pretended to read stories; but they used present tense verbs, relational processes (e.g., "most oranges are spheres"), coclassification chains (e.g., *them—most tunnels*), and different text structures (e.g., topic presentation, description of attributes, characteristic events) to pretend to read informational texts (Pappas, 1991). When researchers have explored the differences between narrative and informational text comprehension, they have discovered that:

> areas in which genre was seen to make a difference include performance on formal assessments, the ability to answer inferential comprehension questions, the quality of written recall, the role of semantic associations, the predictive power of decoding and world knowledge, text orientation (prospective versus retrospective), the ability to detect inconsistencies in text, and the degree to which readers employ the following processes: predicting; confirming predictions; accessing general knowledge and associations; focusing on personal knowledge and experiences; discussing prior knowledge; commenting on structure; self-questioning; re-reading; inferring; referring to antecedent information; integrating incoming information; synthesizing; making intertextual comments, making extratextual comments; and managing reading behaviour. (Duke & Roberts, 2010, p. 80)

In short, readers do not use the same expectations and processes to comprehend narrative and informational texts – suggesting that reading comprehension may be genre-specific. Because informational texts may also have different purposes and characteristics (e.g., persuasive vs. procedural texts; NAGB, 2008), a genre-specific view raises the possibility that informational text comprehension may involve more than one set of processes – and U.S. elementary students' literacy achievement may depend on being able to apply differentiated comprehension approaches.

Comprehending Informational Texts

Informational texts are frequently portrayed as inclusive of multiple types of text. For instance, the NAGB (2008) defines informational texts as "exposition, argumentation and persuasive text, procedural text and documents" (p. 10). They suggest that exposition "presents information, provides explanations and definitions, and compares and contrasts" and includes "textbooks, news stories, and informational trade books" (p. 10). Argumentation and persuasive text "seeks to influence through appeals that direct readers to specific goals or try to win them to specific beliefs" and includes "political speeches, editorials, and advertisements" (p. 10). Procedural texts permit readers to "reach a goal or complete a product" and "include (but are not limited to) manuals and product support materials, directions for art activities and hobbies, and so on" (p. 10).

Biography, persuasive texts, and procedural texts are frequently identified as informational text (e.g., Harvey & Goudvis, 2009; Michigan Department of Education, 2005; Moss & Loh, 2010). For example, the Common Core State Standards define informational text broadly as "Literary Nonfiction and Historical, Scientific, and Technical Texts," and specifically as "biographies and autobiographies; books about history, social studies, science, and the arts;

technical texts, including directions, forms, and information displayed" (National Governors Association & Council of Chief State School Officers [NGA & CCSSO], 2010, p. 31).

Informational texts are ubiquitous. For example, basal reading programs, content area textbooks, and tests include informational selections (e.g., Flood & Lapp, 1986; Moss, 2008; Mullis, et al., 2007). Contemporary state standards and high-stakes assessments increasingly mandate attention to different types of informational texts (e.g., NAGB, 2008; NGA & CCSSO, 2010). U.S. students may read informational trade books, newspaper articles, websites, and other texts during daily lessons and leisure activities; as they become adults, they will also encounter a broad range of informational genres such as business memos, product and travel brochures, informational websites, and periodicals at home and work (Smith, 2000; Venezky, 2000).

U.S. educational research and reform has attempted to optimize informational text comprehension. Researchers have studied U.S. elementary students' informational text comprehension and development. They have found, for example, that U.S. elementary students possess extensive knowledge about narrative texts by second grade, while their knowledge of informational texts remains more limited (e.g., Donovan, 2001; Kamberelis, 1999; Langer, 1986; Stein & Glenn, 1979; Stein & Policastro, 1984). To illustrate: The third and sixth graders in Langer (1986) recalled approximately 20-21% of the story passages ("Jackie" and "The New Kid) but as little as 12% of the informational texts ("The Mole" and "The Crowd Pleasing Conservationist"). Their story recalls also included more individual facts, words, and genre-typical features and better preserved the original meaning of the passage.

Researchers have documented that U.S. students receive uneven exposure to different types of text. Students seem to have more opportunities to read narrative texts than other genres (Duke, 2000; Moss, 2008; Pappas, 1993). Duke (2000), for instance, found that first-graders

spent less than four minutes per day, on average, with informational texts; and Moss (2008) discovered that only 40% of the passages in two widely-adopted reading anthologies were informational.

U.S. students can also improve their comprehension and learning when teachers include informational texts in their instruction (cf., Gersten, Fuchs, Williams, & Baker, 2001; Robinson, Faraone, Hittleman, & Unruh, 1990). In one set of studies, second graders participated in explicit expository text structure instruction and substantially increased their recall, identification of structural clues, completion of graphic organizers, vocabulary knowledge, and transfer of learning to similar passages (e.g., Williams, et al., 2005; Williams, et al., 2007). Other researchers have also documented significant increases in elementary students' comprehension after participating in reading or content area instructional programs (e.g., Englert & Mariage, 1991; Guthrie, et al., 2004).

In addition, recent educational reforms have focused on U.S. students' informational text comprehension. For example, the new Common Core State Standards includes dedicated K-5 standards for informational texts (NGA & CCSSO, 2010). The 2009 *National Assessment of Educational Progress* [NAEP] Reading Framework includes multiple types of informational text (NAGB, 2008). Many contemporary classroom materials and professional development activities also feature informational texts (e.g., Duke & Bennett-Armistead, 2003; Moss, 2008; Saine & Webster, 2010).

Yet, U.S. elementary students' ability to comprehend informational text remains an area of concern. Their informational comprehension performances on large-scale assessments are often neither proficient nor equal to students' achievement in many other developed countries (Donahue, Daane, & Jin, 2005; Lee, et al., 2007; Mullis, et al., 2007; Park, 2008). For example,

U.S. fourth graders' average score for "reading for information" on the NAEP (219 out of 500) corresponded to the Basic Reader achievement category (Lee, et al., 2007, p. 8). For the *Progress in International Reading Literacy Study* [PIRLS], fourth graders' average scale score for informational reading was significantly lower than their literary reading score: 537 vs. 541 (Mullis et al., 2007, p. 51).

Genre-Specific Informational Comprehension

Because U.S. elementary students continue to struggle with informational texts, more research is needed. Insight into students' comprehension activity for different types of informational texts is particularly essential: "unless researchers first generate an accurate description of an educational phenomenon as it exists, they lack a firm basis for explaining or changing it" (Gall, Gall, & Borg, 2007, p. 301). In other words, establishing baseline patterns for U.S. elementary students' informational text comprehension and examining whether (and to what degree) students differentiate their comprehension processes by genre may suggest new avenues which researchers and reformers can pursue to examine and address U.S. students' difficulties with informational comprehension.

To my knowledge, no one has yet directly compared how U.S. elementary students comprehend multiple types of informational text. Researchers who have provided insights into elementary students' comprehension and growth have concentrated on narrative texts (e.g., Baker & Stein, 1981; Stein & Glenn, 1979; Stein & Policastro, 1984) and a particular type of informational text labeled variously as reports (e.g., Langer, 1986), exposition (e.g., NAGB, 2008), or informational writing (e.g., Donovan, 2001). This is also true of comprehension interventions (e.g., Armbruster, Anderson, & Ostertag, 1987; Baumann & Bergeron, 1993; Idol & Croll, 1987; Williams, et al., 2005). With a few notable exceptions (e.g., Purcell-Gates, et al.,

2007), when researchers have attended to U.S. students' comprehension of multiple genres, they have also followed the same trend by comparing narrative texts, informational texts (usually represented by exposition), and sometimes poetry (e.g., Donovan, 2001; Kamberelis, 1999; Langer, 1986).

The other types of informational text featured in elementary standards documents and high-stakes tests (e.g., NAGB, 2008; NGA & CCSSO, 2010)—argumentation and persuasive text, procedural text (and other technical texts), and biography and autobiography—have received much less attention. Only a small number of studies have featured argumentative or persuasive texts (e.g., Akiguet & Piolat, 1996; Dolz, 1996; Stein & Albro, 2001), informational storybooks (e.g., Jetton, 1994; Leal, 1993); and shopping lists (Zecker, 1996, 1999). Biography has rarely, if ever, been explicitly identified as a focal genre, and only one elementary comprehension study has used procedural texts (Purcell-Gates, et al., 2007).

To address the gap and contribute to a foundation for additional research and reform, this study gathered insights into elementary students' thinking as they read the three types of informational texts that are prominent in the elementary arena but remain understudied:

- *Biography*: An "account of a person's life written by another person" (NAGB, 2008, p. 59);
- *Persuasive Text*: Text "whose function is to convince an audience or to prove or refute a point of view or an issue" (NAGB, 2008, p. 63); and
- *Procedural Text*: "Text that conveys information in the form of directions for accomplishing a task. A distinguishing characteristic of such text is that it is composed of discrete steps to be performed in a strict sequence with an implicit end product or goal" (NAGB, 2008, p. 63).

Method

Research Design

I used a cross-sectional descriptive research design. Descriptive research provides snapshots of educational phenomena by making careful descriptions and being "concerned primarily with determining 'what is'" (Gall, et al., 2007, p. 301). The cross-sectional design allowed me to capture and depict students' thinking at different grade levels and with different texts. I collected students' verbal recalls and responses to background questions, and I analyzed their reported uses of the comprehension processes involved in reading three understudied informational genres at four grade levels.

Sample

The sample included 40 elementary students. This sample size was deemed to be large enough to yield reliable results for the grade level by genre comparisons without overburdening a single investigator. Verbal protocol studies traditionally feature small sample sizes. The studies in Pressley and Afflerbach's (1995) review of verbal protocol research included an average of 21 participants, with a majority of designs featuring fewer than 20 participants. Researchers who have used verbal protocols in elementary schools have typically focused on sample sizes of 30 or fewer (e.g., Hilden, 2008; Kucan & Beck, 1996).

Ten students each from the second through fifth grades participated. These grades were featured because verbal protocols had already been validated for use in the second grade and higher (cf., Hilden, 2008; Pressley & Afflerbach, 1995) when data collection started and the elementary grades are often viewed as terminating at fifth grade (e.g., NGA & CCSSO, 2010). To minimize potential teacher, school, or state effects and better reflect contemporary variation in U.S. student populations, I drew the sample from 5 districts, 7 schools, and 20 classrooms in

Michigan and Nebraska. These students came from diverse contexts (National Center for Education Statistics, 2007-2008); the districts were situated in urban (n = 3), suburban (n = 1), and rural (n = 1) neighborhoods, and they represented multiple school types: public (n = 3), private (n = 1), and charter (n = 1). School enrollments ranged from 306 to 756 and included Caucasian (0-94%), African American (1-100%), Latino/a (0-10%), Asian (0-3%), and Native American (0-2%) students.

To select participants, I first secured permission from participating districts and schools. Teachers at the focal grade levels were then invited to participate, and I obtained informed consent from the first teacher who responded to the invitation at each grade level in each school. I offered all students in the participating classrooms the chance to participate, and parents of potential participants provided informed consent and demographic information. Then teachers were asked to consider standardized test results, classroom assessment products, and daily observations and rate the potential participants as below-, on-, or above-grade level readers. Finally, I randomly selected two participants from each teacher's final list of consented on-grade-level readers.

The final sample included 26 females and 14 males. Consistent with the populations from which participants were drawn, the students were Caucasian (70%), African American (27.5%), Latino/a (5%), Asian, (2.5%), and Other (2.5%). (The total exceeds 100% because three students were dually classified as Caucasian and African American.) Maternal education levels have often been used in previous research to gauge participants' socioeconomic backgrounds (Entwisle & Astone, 1994; Harwell & LeBeau, 2010). The mothers of the participants reported their highest level of education as Eighth Grade (5%), High School (50%), Associate degree program (17.5%), Bachelors degree program (22.5%), and Masters degree

program (5%); these reported levels suggested that the elementary students came from a range of socioeconomic backgrounds but primarily from lower and middle SES backgrounds. The mean age of participants at each grade level (second through fifth) was respectively: 7.43, 8.66, 9.57, and 10.39 years.

Materials

The materials for this study included 1 puzzle and 3 sets of texts. I used the puzzle in the verbal protocol training task and the text sets with the verbal protocol tasks.

Puzzle. Verbal protocol studies featuring young students have often provided a brief think-aloud training (Hilden, 2008; Jimenez & Duke, under review). Following this precedent and published recommendations (e.g., Hilden & Pressley, 2011; Pressley & Hilden, 2004), I used a 24-piece puzzle featuring a formally-attired male and female monkey posing for a photograph in the training task. Five puzzle pieces (1 corner, 2 frame, and 2 middle) contained the same think-aloud prompt used later in the verbal protocol task (i.e., a red star sticker).

Text sets. There were three text sets: biography, persuasive text, and procedural. The text sets included one text for each grade level (second, third, fourth, and fifth). To resemble common exemplars of each genre and avoid student fatigue, I used stand-alone "chapters" in multi-chapter trade books designed to be read in 5 minutes or less (Hasbrouck & Tindal, 2006).

Each text set included one published text and three constructed texts for each grade level. Because an extensive four-phase search that included collegial recommendations and electronic and hand searches failed to yield four candidate texts in each text set similar enough to satisfy study requirements, I used three published texts from the initial search. (Table 1 summarizes the key characteristics of these texts.) I then created the other three texts in each text set by adapting each published text. Each text set was designed to be appropriate for on-grade-level readers at

each grade and similar for 10 elements that can influence readers' comprehension activity (e.g., Chall, 1999; Hiebert, 1999): authenticity, background knowledge demands, cohesive markers, engagingness, genre, prototypicality, text difficulty, text features, text length, and topic. During the text construction process, I compared the published and constructed texts to existing summaries of each genre's prototypical characteristics (e.g., Mooney, 2001; Purcell-Gates, et al., 2007) and used previously-published scales (Chall, 1999; Dale & Chall, 1948; Hasbrouck & Tindal, 2006; Spache, 1974) to guide text length and difficulty.

To construct the physical texts, I typed the adapted (and original) prose into a word-processing program, printed it out, and pasted it on top of the original prose in purchased copies of the published texts. Finally, following established precedents (Hilden, 2008; Olshavsky, 1966/1977), I affixed red star stickers at the end of each paragraph or step to explicitly remind participants to stop and think-aloud.

I asked several experts to validate the materials. For example, an expert in genre theory and informational texts identified the genre of each selected text; her identifications agreed with my genre designations 100% of the time. The expert and six expert readers (i.e., those with advanced college degrees) rated each text on its genre and degree of authenticity. The experts nearly always strongly agreed or agreed that each of the texts were representative of the genre and resembled published texts (142 of 144 ratings, with the other two being "I don't know"). The expert readers also judged whether the difficulty of the texts in each text set increased in the expected order (e.g., the second-grade text was easier than the third-grade text). They ordered the texts as expected most of the time (10 of 12 ratings). Twelve veteran elementary teachers at each grade level also evaluated the target text set's grade level designation, background

knowledge demands, topics, and engagingness and agreed 87% of the time that they were appropriate.

Finally, 18 pilot students (3-6 from each focal grade level) answered the background questions, thought aloud while reading each text, and provided feedback. The on-grade-level readers read the texts with accuracy rates that ranged from 93-99%. All students verbalized their thinking or reported that they weren't thinking anything as they read each text. In their feedback, the students indicated that they did not find the instructions and activities confusing and liked the texts and topics; they also exhibited high engagement (e.g., eye contact, smiles, minimal pauses).

Data Collection

I collected data in four audio-taped sessions outside of the classroom. Each session lasted between 15-20 minutes and occurred on different days. During the first session, participants did the verbal protocol training task and answered questions about their backgrounds. For the remaining sessions, they read the texts in counterbalanced order and participated in concurrent verbal protocol tasks, while I checked participants' decoding and asked additional questions.

Verbal protocol training task. To increase participants' comfort and willingness, all practiced thinking aloud before they read. Using Hilden (2008) as a model for the procedures and prompts, I asked participants to think aloud while putting together a jigsaw puzzle. I told them that they could share their thinking at any time and asked them to stop and think aloud when they saw a red star sticker. In accordance with published guidelines that recommend minimal interference (Hilden & Pressley, 2011; Pressley & Hilden, 2004), I provided neither modeling nor guidance in how to think aloud. During the task, I followed five guidelines:

- Before participants started and after they finished, I asked: "What are you thinking or feeling?"
- When they were silent, skipped the thinking prompt, or responded nonverbally, I asked: "What are you thinking or feeling?"
- When participants responded that they were not thinking anything for the third time, I reminded them that it was important to say what they were thinking when they saw a sticker and asked them to try.
- When they were not clear, I asked: "Can you say a little more about that?"
- When participants asked for help with decoding words, I used minimal encourage prompts (e.g., "Try your best," "Go on").

Verbal protocols with texts. To gain insight into students' reported use of processes, I administered concurrent verbal protocols. Verbal protocols have proven to be a reliable, valid, and commonly-used approach to collecting data about readers' comprehension processes (Ericsson & Simon, 1984/1993; Pressley & Afflerbach, 1995; Pressley & Hilden, 2004). The method is designed to yield information about cognitive processes, sophisticated reasoning, and affective reader responses (Pressley & Afflerbach, 1995). Participants can "self-report the contents of their short-term memory" (Pressley & Afflerbach, 1995, p. 7), and concurrent think-alouds are better than retrospective think-alouds for capable readers reading on-level texts (Ericsson & Simon, 1984/1993; Pressley & Hilden, 2004).

I administered the verbal protocols in the second, third, and fourth sessions (Afflerbach, 2000; Hilden, 2008). For each verbal protocol, I told participants:

*Just like when we put the puzzle together (*or *yesterday), I want to know what you are thinking, because I'm interested in learning more about how boys and girls think while*

reading. Nothing that you think is wrong or silly, and everything is important. You can tell me what you are thinking whenever you want. Also, you should stop and say what you are thinking whenever you see a sticker like this. It's okay if you aren't thinking anything. You can just say I'm not thinking anything right now. While you are reading, you can look at any of the pages that you want.

After checking that they comprehended the instructions, I continued with: "To review, I want you to read aloud the chapter I've marked and to tell me what you are thinking." Then, for the biography and persuasive texts, I said: "When we finish, I'm going to ask you to tell me what you read." For the procedural texts, I said, "You can use these materials as you read, if you want. When we finish, I'm going to ask you to show me how to make it without looking at the book." I followed the same five guidelines used in the verbal protocol training task during participants' readings.

Lastly, I conducted a decoding check as participants read. Because too-difficult texts may confound participants' ability to think-aloud and arouse negative affect (i.e., frustration, anxiety) in young readers, I took and analyzed running records of the first 150 words (representing between 27% and 87% of the total prose). No participant read below Betts' (1946) accuracy rate of 90%.

Student background questions. Readers' previous knowledge and experience can affect students' comprehension (e.g., Afflerbach, 1990; Pritchard, 1990), so I used self-report measures to learn how much participants already knew about the focal task, topics, and genres. I asked two sets of questions. To gather information about participants' familiarity with the task and topics during the first session, I asked questions such as: "Have any of your teachers ever asked you to think-aloud? When? How often?" and "Have you ever read or learned about

periscopes? Tell me about periscopes." To avoid influencing participants' think-alouds, my questions at the end the last three sessions were about their familiarity with the focal genres:

- *Have you ever read any other books that are the same kind of book as this one? When I say the same kind of book, I mean a book that people read for the same reason and that has some of the same features or characteristics. By features or characteristics, I mean an important part or quality of this kind of book. When? How often?*
- *What do you know about books that are the same kind of book as this one?*

Data Coding and Analysis

I collected (1) verbal protocol data, (2) verbal responses to questions about participants' previous knowledge, and (3) oral recalls (analyzed in a separate study; Martin, in preparation). Afterward, I transcribed all data, assigned ID numbers, and coded and analyzed the verbal protocols and responses to background questions.

Verbal protocol data. I examined participants' verbal protocols for the presence and frequency of comprehension processes. I followed previous precedents during coding and analysis (e.g., Lincoln & Guba, 1985; Strauss & Corbin, 1998). I began by dividing the data into idea units (Chafe, 1980, 1985), because participants often included multiple ideas within one turn of talk and this unit of analysis permits more than one idea per turn to be analyzed. I then used an iterative reread-code-revise coding process: I read the first idea unit, applied an a priori or emergent code, read the next idea unit, applied the same code or a new code, and so on until all idea units had been coded; then I reread all units, added new codes to capture finer distinctions (e.g., different types of monitoring), recoded units that fit the newer codes or seemed to better fit a different code, and repeated these steps until no more changes were made.

The a priori codes were adapted from Pressley and Afflerbach's (1995) synthesis of comprehension processes that readers have reported using in previous verbal protocol studies. The Appendix lists, defines, and provides examples of these codes.

Emergent codes were used when idea units did not match an existing code (it is not surprising that there were these because the research reviewed by Pressley and Afflerbach included few, if any, studies in which elementary students read multiple types of informational texts). For each idea unit that did not match a process listed in Pressley and Afflerbach (1995), I applied the code of "Other." Then I used the same previously-described process to develop and apply labels describing the comprehension process being used. These codes are also discussed in the Appendix.

I deemed coding to be complete when all units were coded and a round of rereading of all transcripts yielded no additional changes. An expert in informational texts and genre theory then reviewed the final code list. The expert suggested the addition of one code (Monitoring Knowledge) and agreed with the remaining codes. I recoded all transcripts to reflect her recommended change.

Next, I recorded the comprehension processes reported by each participant on Microsoft Excel spreadsheets. I computed the total number of comprehension processes and the range of processes used overall, for each grade level, and for each genre set. I also kept running counts of participants' total use of individual processes overall, for each grade level, and genre. Lastly, I examined the similarities and differences in participants' use of processes by (a) grade level, (b) genre, and (c) genre by grade level. I calculated the correlations among students' total use of processes (and their use of individual processes) and the three genres. In addition, I conducted

one-way Analyses of Variance or ANOVAs (grade level comparisons), repeated measures ANOVAs (genre comparisons), and mixed ANOVAs (genre by grade level comparisons).

Student responses to questions. I examined participants' responses to gauge their knowledge of (a) the task, (b) each topic, and (c) each genre. As I will describe further below, I drew on established procedures during coding and analysis (e.g., Glaser & Strauss, 1967; Strauss & Corbin, 1998) but used three levels of coding. To summarize the coding scheme: the first level of coding (hereafter called "microcodes") captured the gist meaning of each idea unit, because participants were likely to provide varied and sometimes unanticipated responses to each question. The second level of coding (hereafter called "macrocodes") characterized the amount of knowledge that the idea unit suggested the participant might have about the task, topic, or genre. The third level of coding (hereafter called "knowledge levels") was applied to the students' complete response to each set of questions (task, topic, or genre). Each knowledge level code characterized the total amount of knowledge that the associated idea units collectively suggested the participant had about the task, topic, or genre.

More specifically, I separated each participant's responses into idea units (Chafe, 1980, 1985) as I read them so that multiple ideas per turn could be analyzed. For the first level of coding, I created and applied the microcodes across all idea units using the same iterative coding process described earlier and stopped when all units had been coded and a round of reading yielded no further changes. To illustrate: when I asked one fifth grader about her procedural text genre knowledge, she said: (a) "I just remembered one book I read. It's… how to make pop-up books;" (b) "I read that last year;" (c) "Umm five times;" (d) "It's arts and crafts;" and (e) "It could be used in many ways, and it can teach you learning too." These idea units were respectively coded: (a) *describes a text that could be categorized in the target genre*; (b) *not*

recurring, unspecified class, occurred during previous years; (c) *number of readings specified, less than 10 readings*; (d) *describes the books' contents;* and (e) *describes the books' purposes*.

For the second level of coding, the macrocodes consisted of six a priori codes:

- *No Knowledge*: Participant provides evidence of lacking awareness and knowledge.
- *Recognition of Concept*: Participant provides evidence of awareness but lacks specific knowledge.
- *Some Knowledge*: Participant provides evidence of minimal knowledge.
- *Much Knowledge*: Participant provides evidence of more than minimal knowledge but less than expertise.
- *Expertise*: Participant provides evidence of extensive, thorough, and sophisticated knowledge.
- *Uninterpretable*: Participant's response is neither clear nor complete enough to permit it to be categorized.

As I read each idea unit, I assigned the first instance of each microcode to one of these six macrocoding categories and applied the assigned macrocode to all remaining instances of that microcode. Coding continued until all microcodes had a corresponding macrocode. For example, the fifth grader's above-mentioned microcodes corresponded to (a) *Some Knowledge*, (b) *Some Knowledge,* (c) *Some Knowledge,* (d) *Some Knowledge,* and (e) *Some Knowledge.*

For the final level of coding (the knowledge levels), I used the same six a priori codes: *No Knowledge, Recognition of Concept, Some Knowledge, Much Knowledge, Expertise,* and *Uninterpretable.* To apply these codes, I read all of the macrocodes associated with the first participant's responses to questions about his or her knowledge of the task. I assigned the set of macrocodes to one of the six knowledge level codes and applied the assigned knowledge level

codes to all identical instances. I repeated this process with all of the participants' responses to the questions about the task. Then I read, assigned, and applied the knowledge level codes to each participant's collective responses to questions about each topic and each genre. For example, the fifth grader's above-mentioned macrocodes collectively corresponded to *Some Knowledge*, because *Some Knowledge* was assigned whenever participants' collective macrocodes were also *Some Knowledge.* In this case, the participant's collective responses suggested she had minimal (but not extensive knowledge) of procedural texts.

I used participants' final knowledge categorizations to explore possible patterns between their prior knowledge of the task, topics, and genres and their reported uses of comprehension processes. I organized participants' profiles by knowledge level and visually scanned for similarities within groups and differences between groups. To explore possible significant differences and interactions among participants' knowledge levels and use of processes, I also calculated the same inferential statistics used to examine the verbal protocols.

Interrater reliability check. To examine interrater reliability (Stemler, 2001), I asked a literacy scholar to participate in initial training and independently code 25% of the data. The scholar coded 30 randomly-selected verbal protocols (5 per genre per grade level) and 10 randomly-selected sets of verbal responses (5 per grade level) from the second- and fifth-grade data. For the students' responses to background questions, our interrater reliability scores were 86% (microding), 93% (macrocoding), and 94% (knowledge categories). For the verbal protocols, our interrater reliability scores were 94% (idea units) and 80% (processes). We resolved all disagreements through discussion.

Results

The students varied somewhat in their reported previous knowledge, but they did not tend to exhibit high levels of knowledge when asked questions about the tasks, topic, and genres. Two students' verbal protocol reports are listed in Table 2. As these examples suggest, students' uses of processes differed consistently by grade level and genre. The differences appeared between (a) the second graders' and third through fifth graders' use of processes, and (b) students' reported use of processes for procedural texts and their reported use of processes for biography and persuasive texts.

Students' Backgrounds

Table 3 displays students' responses to the task, topic, and genre knowledge questions. Students most often reported that their teachers either had never or infrequently asked them to think aloud. The elementary students also seemed to have minimal experience with Michael Anderson, periscopes, and water conversation. The majority of the students' responses were categorized *No Knowledge* or *Recognition of the Concept*, and none demonstrated *Expertise.* Even those with higher knowledge categorizations (e.g., *Much Knowledge*) provided fewer than three accurate facts about each topic. The students also did not appear to have a lot of knowledge about biography, persuasive texts, and procedural texts. Most of their responses were categorized as *No Knowledge* or *Recognition of the Concept*, and individual students reported only a handful of ideas per type of text (0-6 facts). Although students' demonstrated knowledge levels varied (typically ranging from *No Knowledge* to *Some Knowledge*), most students demonstrated low amounts of knowledge about the task, topics, and genres featured in the study.

Moreover, the students' apparent previous knowledge did not differ extensively across grade levels. There were no significant interactions between students' prior knowledge and their reported use of processes. Also, as Table 3 shows, higher (or lower) percentages of each

knowledge level category in the total group always visually corresponded with higher (or lower) percentages in each of the grade-level groups, and the number of students who were categorized at a specific knowledge level typically did not vary by more than two students by each grade level. For example, for periscopes, most of the students seemed to have *No Knowledge,* with the total number for each grade level ranging from seven to nine. The number of students at each grade level who exhibited *Recognition of Concept* varied from zero to one, and the numbers who showed *Some Knowledge* and *Much Knowledge* ranged from zero to two per grade level. No student displayed *Expertise* in their knowledge of periscopes.

Finally, students' reports did not vary by their demographic characteristics. Students' gender, racial or ethnic backgrounds, and levels of maternal education did not interact with their reported use of processes.

Students' Total Reported Use of Comprehension Processes

Table 4 summarizes the students' overall reports. As this table shows, the elementary students were often strategic; almost four-fifths of their total reports included comprehension processes. [The remaining one-fifth of their reports consisted of "I don't know," "I'm not thinking anything," and comments unrelated to either the text or reading experience (hereafter called *reports of non-processes*).]. The group used 21 different processes to comprehend the informational texts.

Reported Comprehension Processes by Grade Level

Table 5 shows students' use of processes at each grade level and suggests that second graders' reports differed from the other grade levels. As the table shows, the third through fifth graders' total use and use of individual processes were similar. For example, the three grade levels used nearly all of the individual processes reported in this study (i.e., 19-20), and 81-85%

of each grade level's total reports included at least one of the processes. In addition, the five most commonly used processes were the same for the third through fifth graders.

In comparison, the second graders used fewer processes and kinds of processes, and they made more reports of non-processes. For example, they reported using at least five fewer processes per text than the older students, and they had almost twice as many reports of non-processes as the third through fifth graders. The second graders also differed in their reliance on individual processes. The group of second graders reported using each individual process between 0 and 40 times ($\bar{x}$ = 21). In contrast, the older grade levels collectively used each process between 0 to 193 times ($\bar{x}$ = 36-40).

The correlational relationships between students' use of processes and grade level also provided some evidence to suggest that their reported use of processes differed by grade level. Students' grade level was correlated with their total use of processes (r = .36, p < .05) and four of the individual processes: Monitoring Knowledge (r = .46, p < .01), Evaluating Content (r = .37, p < .05), Monitoring Problems (r = .33, p < .05), and Evaluating Mindset (r = .32, p < .05). In addition, the correlation between students' grade level and students' reports of non-processes (r = -.28) approached significance (p = .08). Notably, these correlations were moderate, and students' grade level was not significantly related to students' use of the majority (i.e., 86%) of the individual processes. For the majority of the reported processes, students in different grade levels were seemingly neither more nor less likely to use the process.

Finally, there was a significant effect of grade level on students' total number of processes, $F(3, 36) = 3.68$, p < .05. Post-hoc analyses, using Tukey's HSD, suggested that the second graders' thinking diverged from that of the other students; they revealed that the mean difference between second and third grade was -19.40, p < .05 and between second and fifth

grade was -19.20, $p < .05$. (The mean difference between second and fourth grade was -15.00. According to Tukey's HSD, this difference was non-significant, $p = .14$.) In this case, the second graders reported using processes about half as often as the third- and fifth-grade students.

Reported Comprehension Processes by Genre

Table 6, which summarizes students' reports for each informational genre, suggests that students' approaches to comprehending the biography and persuasive text were approximately the same. As the table shows, their total and mean use of processes, most and least popular processes, and reports of non-processes were similar for the two types of text. For example, the students reported using nine processes on average per text, and approximately three-fourths of their total reports included comprehension processes. Table 7, which lists the correlations between genre and individual processes, also shows the similarities in students' reported use of processes for both genres. The group's total reported use of processes and their reports of non-processes were related to their reported uses of processes for persuasive texts and biography at a level of statistical significance. Eight of the individual processes were also related at a level of statistical significance for biography and/or persuasive texts. Apparently, students who used Inferencing, Integrating, Interpreting, Evaluating Content, Monitoring Problems, Questioning, Relating, and Summarizing with the biography tended to be significantly more likely to also use them with the persuasive text.

In contrast, students' reported use of processes differed for the procedural text. In Table 6, the group's mean and total use of processes were much higher and their reported non-processes much lower. For example, compared to the biography and persuasive text, students used seven more processes on average per text when they read the procedural text, and their total reports included 7-10% fewer instances of "I'm not thinking anything." Table 7 shows that the

correlations between students' reported uses of individual processes and the text's genre tended to be insignificant between procedural texts and biography, procedural and persuasive texts, or both genres. For most of the individual processes, relationships did not appear to exist between students' reported use of a process for procedural text and one or both of the other types of texts.

In addition, the highly significant effect of genre on students' total use of processes centered on the procedural texts. Mauchly's test indicated that the assumption of sphericity had been violated, $\chi^2(2) = 20.37$, $p < .01$. Using Huynh-Feldt estimates of sphericity ($\epsilon = .73$), the differences among students' use of processes by genre were $F(1.45, 56.59) = 21.60$, $p < .01$. Pairwise comparisons suggested that only the mean differences between procedural text and the other genres were significant: 6.50 (biography, $p < .01$) and 6.78 (persuasive text, $p < .01$). The students reported using nearly twice as many processes when reading procedural texts as when reading biography and persuasive texts. Lastly, as Table 8 reveals, genre affected students' use of 10 of the individual processes, with almost all of the significant differences between procedural text and the other genres. Students reported using Evaluating Mindset, Monitoring Problems, Questioning, and Repeating Text, twice as often for the procedural texts than for the biography and persuasive texts. They reported using Interpreting and Monitoring Processes three times as often for procedural texts than for the other genres. (For Evaluating Content, students reported using this process half as often with the persuasive texts as with the procedural texts and biography. The pairwise comparisons for Additional Action, Integrating, and Summarizing were non-significant.)

Reported Comprehension Processes by Genre by Grade Level

Tables 9-11 summarize students' uses of processes by genre by grade level and reveal the same patterns already reported separately for grade level and genre. For example, second

graders' processes seemed to differ by genre from the other grade levels. For each type of text, their total and mean uses of processes were substantially lower, and their reports of non-processes higher. The second graders used 3-5 fewer processes on average per type of text than the third through fifth graders, and they collectively reporting using anywhere from 39 to 117 fewer processes per genre than their older peers. Second graders' reports of non-processes were between 16-21% higher for each genre than the third through fifth graders. In addition, students' use of processes appeared to be similar for the biography and persuasive texts and different for the procedural text. Each grade level used more processes (and made fewer reports of non-processes) for the procedural text than for the other genres; the grade level groups used a total of 39-117 more processes when reading procedural texts, with individuals using 7-11 more processes on average per text. The groups' reports of non-processes for procedural texts were between 4-12% lower than their reports of non-processes for biography and persuasive texts. At each grade level, the sets of most and least popular processes were similar for biography and persuasive texts but different for procedural texts. For example, students at each grade level often reported summarizing with the biography and persuasive texts but not the procedural texts. In contrast, the grade level groups frequently reported monitoring processing with procedural texts but not with biography and persuasive texts.

Furthermore, students' use of processes for each genre did not diverge by grade level. With the exception of two processes (Monitoring Processes and Monitoring Problems), there were no significant interactions between genre and grade level. [For Monitoring Processes and Monitoring Problems, Mauchly's test indicated that both processes violated the assumption of sphericity, respectively: $\chi^2(2) = 60.29$, $p < .01$ and $\chi^2(2) = 80.48$, $p < .01$. Huynh-Feldt estimates of sphericity were used: $\epsilon = .60$ (Monitoring Processes) and $\epsilon = .57$ (Monitoring

Problems). The interaction effects were: $F(3.60, 43.24) = 3.19$ (Monitoring Processes) and $F(3.44, 41.32) = 2.94$ (Monitoring Problems). Both were significant ($p < .05$).] The existence of only two interaction effects suggests that students' use of processes within genres usually varied in similar ways for each grade level.

Discussion

In this study, elementary students reported their thinking as they read three types of informational texts. Students' reported use of processes differed substantially (although many similarities could also be detected). Second graders appeared to be less strategic than the third through fifth graders: they reported less comprehension activity and used fewer processes to make meaning. Students at all grade levels also adopted dissimilar comprehension approaches: the processes they reported when reading procedural texts contrasted in type and frequency from their use of processes when reading biographies and persuasive texts.

Comprehending Informational Texts

The elementary students in this study mostly used the same processes that other readers have used in previous verbal protocol studies (Pressley & Afflerbach, 1995). Just as other readers have done while reading informational texts (e.g., Langer, 1986; Olson, et al., 1981), these on-grade-level readers related the texts to their lives, other texts, and the world; elaborated; interpreted; and reacted to the ideas that had just been presented. The elementary students used processes typically associated with global meaning-making (e.g., inferencing, integrating, summarizing) a small fraction of the time; even then, their thinking tended to emphasize local information. Students' summaries, for example, often focused on the paragraph that had just been read (e.g., "He wanted his dream to come true and his parents are encouraging him to do stuff," "they're telling us that umm fish might die out and they would need to move or die and

that's all"), and their inferences frequently involved drawing conclusions about single graphics (e.g., "There's a whole bunch of astronauts right here," "I'm thinking that that's a big ocean with little rocks in it").

The study results provided additional evidence that elementary students' comprehension is not unitary (cf., Duke, 2005; Duke & Roberts, 2010). Just as comprehension differs for narrative and informational texts, this study suggested that differences might also exist among students' comprehension of multiple *types* of informational text. The elementary students appeared to adopt at least two approaches when they comprehended the types of informational texts: one for procedural texts and another for the biography and persuasive texts. They reported using certain processes significantly more often when reading procedural texts than reading the other informational genres. The students' reports also included processes (e.g., self-direction) for the procedural texts that did not appear in their reports for the biography and persuasive texts.

The study results, however, did not provide unqualified support for the concept of genre-specific reading comprehension. I expected that the elementary students would comprehend each type of informational text differently, but the second through fifth graders' reported use of comprehension processes for biography and persuasive texts were similar. They tended to use the same processes, and the frequency with which they used many processes was similar. There may be several potential explanations for this finding. It is possible, for example, that biography and persuasive texts are related in ways that encourage readers to treat them as members of the same genre. Or reading comprehension may be affected by differences among broader categories of text (e.g., argument; Kinneavy, 1972).

Perhaps the most likely explanation involves students' current developmental levels. During the elementary grades, on-grade-level U.S. readers may be just beginning to differentiate their informational text comprehension by genre. Comprehension is an unconstrained skill that develops over the course of many years (e.g., Paris, 2005), and U.S. elementary readers' narrative comprehension is substantially more advanced than their informational text comprehension (e.g., Donovan, 2001; Kamberelis, 1999; Langer, 1986). Previous research has suggested that U.S. students' informational comprehension continues to develop throughout middle and high school (e.g., Langer, 1986; Taylor, 1980), and some studies have raised the possibility that significant changes in students' comprehension of certain types of informational text occur after the elementary grades. For example, Brassart (1996) asked 120 third through seventh graders to recall an argumentative text after reading along to an audio-taped adult read-aloud. The researcher found highly-significant differences between (a) the third through fourth graders' and fifth through seventh graders' micropropositions and (b) the third through fifth graders' and sixth through seventh graders' macropropositions. Brassart concluded that "this quantitative and qualitative analysis of recall suggests that argumentative text as such, i.e. as directed to an argumentative conclusion, is not mastered until relatively late, at least not before grade 7 (age 12-13)" (p. 170). All the students in this study were younger than middle and high school students, and significant grade level and genre differences among students' reported use of processes did exist. It may be that U.S. students do not *yet* differentiate their comprehension for all informational genres.

Elementary Students' Informational Comprehension Development

The study results also provide interesting insight into elementary students' comprehension development. Although the study results supported previous research that has

noted growth in U.S. elementary students' informational text comprehension (e.g., Donovan, 2001; Langer, 1986), there was not a smooth developmental progression. Instead, their reported use of processes seemed to change significantly between second and third grade and remain roughly the same during the other elementary years. Children's informational text comprehension development might be non-continuous or stage-like – a finding often documented in research on other mental processes (e.g., Ehri & McCormick, 2004; Piaget, 1971). For example, Piaget (e.g., 1954, 1971) concluded that students progressed through at least two distinct stages in elementary school: preoperational (until the age of 7) and concrete operations (until the age of 12).

Moreover, the elementary students' thinking did not seem to be affected by interactions between genre and grade level. Although genre and grade level differences were found, these differences tended to vary similarly; within each genre, each grade's performances were roughly parallel to their performances for the other genres. This may mean that the trajectories of children's genre-specific informational text comprehension growth are similar. Students' approach to procedural texts and to the other two genres may not mature differently – at least during the elementary grades.

Studying Elementary Students' Use of Processes

The study also adds to current conceptions of readers' processes. The grade levels and texts featured in this study have infrequently received attention in other verbal protocol studies. For example, the corpus in Pressley and Afflerbach (1995) included multiple types of texts (sometimes even within one study): narrative texts (13 studies), poetry (3 studies), informational texts (24 studies) and unspecified (4 studies). The researchers' descriptions of these texts suggest that biography and procedural texts were rarely, if ever, featured. Similarly, only four of

the 38 studies focused on younger readers (3 with sixth-graders and 1 with fourth and fifth graders), and no second- or third-grade students were included. The study establishes baseline patterns for the younger readers' reported uses of processes in the three focal genres that can be added to the existing verbal protocol corpus. These elementary students also used two processes not explicitly identified in other studies: Self-Direction and Additional Action (see the Appendix for more information). When they read the procedural texts, students sometimes commanded themselves to do a particular action, such as "Cut it right there" and "Use the pencil." They also discussed actions they would take to respond to the texts or to learn more about the topics after the reading experience ended, such as "I'm thinking that I'm going to look him up on Google, see what else he did" or "I'm going to tell my mom that we need to recycle..." These two processes can be added to the existing lists of processes that readers use to comprehend texts.

Implications for Research and Practice

The study results complicate informational text comprehension research and practice. The elementary students used more than one approach to comprehend the three types of informational texts featured in this study, so researchers may need to take genre into account when investigating children's informational comprehension development or testing interventions that include informational texts. Rather than focusing on students' "informational comprehension" development and achievement, it may be necessary to document and address students' comprehension of multiple types of informational text.

Policy documents and assessments are increasingly requiring elementary students to read diverse informational texts (e.g., NAGB, 2008; NGA & CCSSO, 2010). This study found significant differences in on-grade-level elementary readers' approaches to different types of informational texts, which suggests that informational comprehension instruction may need to be

more sensitive to the role of genre. It may not be enough to focus on "comprehension" or even "narrative comprehension" and "informational comprehension." A more differentiated approach that mirrors elementary students' reported use of processes when they read various informational texts may be needed.

Finally, the study results have established baseline patterns for U.S. elementary students' comprehension of three types of informational text and raised the possibility that this population is beginning to differentiate their comprehension processes by genre. Researchers and educational reformers can use this foundation to continue exploring and addressing U.S. elementary students' informational text comprehension difficulties.

Future Directions for Research

The current study raised several exciting possibilities for future research. For instance, future studies could focus on adolescent on-grade-level readers. Exploring older students' and proficient adult readers' comprehension of biography, persuasive texts, and procedural texts would allow researchers to examine whether students' reading comprehension becomes further differentiated with age and learn more about the developmental trajectories of students' reported use of processes with different types of informational text.

In addition, researchers could explore whether the results of this study are equally true for other student populations. The current study focused on on-grade-level readers – only a small fraction of any elementary classroom. Examining whether struggling readers and gifted children – two populations that are not always well-served in today's elementary schools – approach informational texts in the same ways that on-grade-level readers do could yield additional insights for practice. If future research identified differences in whether and how above- and

below-grade-level readers differentiate their processes for multiple genres, the results could eventually suggest ideas for instruction and intervention.

Lastly, the results of this study suggest that extending the focus to other media and formats might be a profitable course of action. For example, exploring whether and how genre interacts with online reading comprehension would be useful. Information and communication technologies (ICTs) are increasingly prominent in and out of school (e.g., Kamil, Intrator, & Kim, 2000; Leu, Kinzer, Coiro, & Cammack, 2004), which means that a higher percentage of students' reading involves electronic texts. Discovering whether and how elementary students' comprehension differs for different types of electronic texts may provide a clearer picture of the relationship between genre and informational comprehension. Moreover, examining students' comprehension of additional informational genres and hybrid texts may be helpful. Mapping on-grade-level readers' reported use of processes and comparing their performances across a wide range of informational and hybrid genres may clarify how genre—and specific informational genres—influences elementary students' comprehension activity.

Limitations

This study had several limitations. Perhaps the two most important limitations are the use of a cross-sectional design and a small number of texts. The cross-sectional design was used to look at children's development across the grades. Although several safeguards were built into the sampling procedures (e.g., teacher ratings, decoding checks) and several potential personal factors (e.g., gender, reports of previous knowledge) were checked for interaction effects, the possibility remains that the differences observed are attributable not just to grade level but also to other individual differences. In addition, each genre was represented by one text. While texts were carefully selected and constructed, some shared textual element (e.g., prototypical vs.

hybrid texts, science vs. social studies topics) may have also affected students' comprehension to the degree that it obscured some differences in processes by genre.

Significance of the Study

This study explored how, if at all, on-grade-level readers' comprehension might differ by genre and grade level for three types of informational text (biography, persuasive text, and procedural text). The participating elementary students' reported use of comprehension processes differed significantly by grade level and genre, providing some additional support for a view of reading comprehension as genre-specific and as developing in significant ways during one or more of the elementary school years. By suggesting that differences in comprehension processes exist between procedural texts and the other informational genres in this study and establishing baseline patterns for three understudied informational genres at four grade levels, this study has contributed to ongoing efforts to optimize U.S. elementary students' informational text comprehension achievement.

Table 1

Description of the Published Texts

Characteristic	Biography	Persuasive Text	Procedural Text
Text Length	255 - 550 words (5 minutes; Hasbrouck & Tindal, 2006)	260 - 550 words (5 minutes)	171 - 360 words (3 minutes)
Purpose	to share the story of Michael Anderson's life	to persuade others to conserve water	to teach others how to make a periscope
Text Organization	paragraphs of running text; chronological recount from birth to death; with a concluding discussion of the man's legacy	paragraphs of running text; statement of thesis followed by reasons, examples, and warrants; with a concluding discussion of ways to protect water	explanation of how a periscope works; listing of materials; step-by-step instructions; brief discussions of interesting facts and questions for further thinking
Features	photographs, captions	photographs, captions, headings, text boxes, factoids	photographs, diagram, materials box, headings, numbered steps, text boxes, informational sidebars
Sources of the Published Texts	*Astronauts Take Flight* (Gott, 2005)	*Save Our Earth* (Stewart, 2005)	*Charting Your Course* (Kafka, 2005)
Text Excerpt	"Michael Anderson was the son of a U.S. Air Force serviceman. He grew up near airfields..." (p. 8).	"Clean water is one of the most important natural resources on Earth. No living creatures can survive…" (p. 12).	"1. Use a cardboard triangle to help you draw two parallel, diagonal lines. One line should be near…" (p. 20).

Table 2

Examples of Readers' Reported Use of Processes

Time	Biography		Procedural Text	
	Second Grader	Fifth Grader	Second Grader	Fifth Grader
Before Reading	Nothing.	Well, I'm not thinking or feeling anything.	Nothing.	I'm not really thinking or feeling anything right now.
During Reading	I'm thinking that is like a famous crew.	Okay, what I'm thinking is its pretty cool he just turned on the tv it seems like and he saw those people go on the moon that inspired him.	I'm not thinking or feeling anything right now.	I think it's cool how it can shine into this one and into the person's eye like that. Do I read the materials?
	I'm thinking that that it's about 500 feet.	I think it's cool that even though he's African American and in this picture he's the only African American he doesn't even care. He just keeps on going.	Nothing.	I think it's funny how you just have to use those ones, and you don't have to use many more than that. I think that's cool and funny.
	I'm not thinking anything.	I'm not really thinking anything right now. So it stops right here?	Nothing.	Well, it looks like you use that little triangle right there. And you just put it like diagonal right here. And then you just draw. And then cut on the same line. So I'd just do that right now?
	I'm thinking that they will drop off that	I think that's cool how he's been to… it looks like 2,000 hours in space.	I'm not thinking anything.	I'm not really thinking anything right now. So you turn it over and do the same thing, and then like this. And then you have to

Table 2 (cont'd)

Time	Biography		Procedural Text	
	Second Grader	Fifth Grader	Second Grader	Fifth Grader
	ship somewhere.			use that cutter.
	Hey, that's when I was born… I'm thinking that that's where the control room is. Do I have to read this [text box]?	I'm thinking that it's cool that they conducted more than 80 science experiments it says.	I'm not thinking anything really.	Well I'm feeling that it's pretty cool that I get to do this. And I'm thinking that, well, not really anything. So you just put it like this. And then it says the mirror should be facing down and the bottom mirror facing up. There. Then facing up. So like this. But facing up. Right here. I think you're supposed to do it… I can't see where the mirror is. Yeah, just need to push it up a little, well push it through. Yeah, it's kind of like crooked.
	I'm not thinking of anything.	I was going to say I wonder who was going to stay alive, but it says all of them died.	You have to use something to make the hole.	I think this is the last step, well at least close to the last step. Level with the bottom mirror, I need to draw a circle, not like a hole. Oh, I'm supposed to prick it right through… Well, it's almost through there.
	I'm not thinking of anything.	And I remember that right here he says I take the risk because I think what we are doing is really important. And it says that right here [too]. That's a caption.	I'm thinking or feeling that that guy's in a submarine.	Well, I think that's cool how they can make it closer then bigger. I think of it kind of like glasses because you can see it better.

Table 2 (cont'd)

Time	Biography		Procedural Text	
	Second Grader	Fifth Grader	Second Grader	Fifth Grader
After Reading	Nothing right now.	I'm feeling happy that he did that. And I'm thinking that's pretty cool that he was the only African American who wanted to do that. He didn't care if he was surrounded by white people because most people would.	Nothing.	I'm feeling that it's pretty cool that I made that and that's what I'm thinking, too.

Table 3

Students' Responses to Background Questions

	Knowledge Level					
Background Question	No Knowledge	Recognition of Concept	Some Knowledge	Much Knowledge	Expertise	Uninterpretable
Task						
Think-Aloud Tasks	47.50%	5.00%	32.50%	15.00%	0.00%	0.00%
Topic						
Michael Anderson	87.50%	5.00%	7.50%	0.00%	0.00%	0.00%
Conservation	82.50%	7.50%	5.00%	5.00%	0.00%	0.00%
Periscopes	80.00%	5.00%	10.00%	5.00%	0.00%	0.00%
Genre						
Biography	52.50%	12.50%	17.50%	17.50%	0.00%	0.00%
Persuasive Texts	27.50%	22.50%	40.00%	7.50%	2.50%	0.00%
Procedural Texts	17.50%	20.00%	47.50%	15.00%	0.00%	0.00%

Table 4

Students' Overall Use of Processes

Processes	Total
Total Use of Processes	
#	1363
Mean (Per Text)	11.35
Individual Use of Processes	
Percentage of Total Reports	78.92%
Kinds of Processes Used	21
The 5 Most Commonly Used Processes	
Evaluating Content	16.14%
Interpreting	15.85%
Inferencing	13.57%
Monitoring Processing	11.23%
Questioning	9.76%
The 5 Least Commonly Used Processes	
Monitoring Text Characteristics	0.22%
Evaluating Style	0.37%
Self-Direction	0.73%
Elaborating	0.59%
Activating Previous Knowledge	0.81%
Reports of Non-Processes	
Percentage of Total Reports	21.08%
I Don't Know	0.41%
Not Thinking Anything	18.53%
Unrelated Comments	2.14%

Table 5

Students' Use of Processes by Grade Level

Students' Comprehension Processes	Grade Level			
	Second	Third	Fourth	Fifth
Total Use of Processes				
#	205	399	357	402
Percentage of Total Processes	15.04%	29.27%	26.19%	29.49%
Mean (Per Text)	6.83	13.30	11.90	13.40
Individual Use of Processes				
Percentage of Total Reports	63.67%	81.43%	81.32%	84.45%
Kinds of Processes Used	18	20	20	19
The 5 Most Commonly Used Processes	Evaluating Content (13.17%) Inferencing (9.27%) Interpreting (19.51%) Monitoring Processing (13.66%) Predicting (9.76%)	Evaluating Content (14.04%) Inferencing (14.04%) Interpreting (14.29%) Monitoring Processing (19.05%) Questioning (10.03%)	Evaluating Content (9.80%) Inferencing (16.81%) Interpreting (17.93%) Monitoring Processing (7.28%) Questioning (10.92%)	Evaluating Content (25.37%) Inferencing (12.44%) Interpreting (13.68%) Monitoring Processing (5.72%) Questioning (9.95%)
The 5 Least Commonly Used Processes	Evaluating Style (0.00%)	Activating Previous Knowledge (0.25%)	Activating Previous	Additional Actions (1.00%)

Table 5 (cont'd)

Students' Comprehension Processes	Grade Level			
	Second	Third	Fourth	Fifth
			Knowledge (0.00%)	
	Monitoring Knowledge (0.49%)	Evaluating Style (0.50%)	Elaborating (0.28%)	Elaborating (0.25%)
	Monitoring Problems (0.00%)	Integrating (0.00%)	Evaluating Style (0.84%)	Evaluating Style (0.00%)
	Monitoring Text Characteristics (0.00%)	Monitoring Knowledge (0.75%)	Monitoring Text Characteristics (0.28%)	Monitoring Text Characteristics (0.25%)
	Self-Direction (0.49%)	Monitoring Text Characteristics (0.25%)	Self-Direction (0.56%)	Self-Direction (0.00%)
Reports of Non-Processes				
Percentage of Total Reports	36.33%	18.57%	18.68%	15.55%
I Don't Know	0.62%	0.80%	0.00%	0.00%
Not Thinking Anything	29.81%	14.29%	18.68%	15.19%
Unrelated Comments	5.90%	3.50%	0.00%	0.20%

Table 6

Students' Use of Processes by Genre

Students' Comprehension Processes	Genre		
	Biography	Persuasive Text	Procedural Text
Total Use of Processes			
#	375	363	629
Percentage of Total Processes	27.51%	26.32%	46.15%
Mean (Use Per Text)	9.38	9.08	15.73
Individual Use of Processes			
Percentage of Total Reports	77.16%	73.78%	83.53%
Kinds of Processes Used	18	20	18
The 5 Most Commonly Used Processes	Evaluating Content (24.80%)	Evaluating Content (14.05%)	Evaluating Content (12.08%)
	Inferencing (18.67%)	Inferencing (20.11%)	Interpreting (20.83%)
	Interpreting (10.47%)	Interpreting (12.40%)	Monitoring Problems (7.15%)
	Questioning (8.53%)	Questioning (7.99%)	Monitoring Processing (19.40%)
	Summarizing (5.33%)	Summarizing (11.57\%)	Questioning (11.45%)
The 5 Least Commonly Used Processes	Activating Previous Knowledge (0.00%)	Evaluating Style (0.55%)	Activating Previous Knowledge (0.79%)
	Evaluating Style (0.53%)	Integrating (0.83%)	Elaborating (0.00%)
	Monitoring Text Characteristics (0.27%)	Monitoring Problems (0.28%)	Evaluating Style (0.16%)

Table 6 (cont'd)

Students' Comprehension Processes	Genre		
	Biography	Persuasive Text	Procedural Text
	Repeating Text (0.00%) Self-Direction (0.00%)	Monitoring Text Characteristics (0.55%) Self-Direction (0.00%)	Integrating (0.00%) Monitoring Text Characteristics (0.00%)
Reports of Non-Processes			
Percentage of Total Reports	22.84%	26.22%	16.47%
I Don't Know	0.41%	0.41%	0.40%
Not Thinking Anything	20.16%	23.98%	13.81%
Unrelated Comments	2.26%	1.83%	2.26%

Table 7

Correlations between Students' Reported Use of Individual Processes and the Texts' Genres

Process	Biography - Persuasive		Biography - Procedural		Persuasive - Procedural	
	r	*p*	*r*	*p*	*r*	*p*
Activating Previous Knowledge	--	--	--	--	-.04	.82
Elaborating	.29	.07	--	--	--	--
Hypothesizing	.06	.70	.46**	<.01	.26	.10
Inferencing	.45**	<.01	.05	.76	.62**	<.01
Integrating	.43**	<.01	--	--	--	--
Interpreting	.37*	.02	.13	.42	.25	.13
Predicting	.16	.33	-.06	.73	.02	.90
Questioning	.79**	<.01	.62**	<.01	.70**	<.01
Relating	.62**	<.01	.16	.32	.08	.62
Repeating Text	--	--	--	--	.01	.96
Summarizing	.39*	.01	.39*	.01	.32*	.05
Text Reading	-.10	.56	.34*	.03	.07	.65
Monitoring - Knowledge	-.04	.82	.12	.47	.21	.18
Monitoring - Problems	-.05	.78	.25	.13	.08	.63
Monitoring - Processing	.66**	<.01	.37*	.02	.35*	.03
Monitoring - Text Characteristics	-.03	.88	--	--	--	--

Table 7 (cont'd)

Process	Biography - Persuasive		Biography - Procedural		Persuasive - Procedural	
	r	*p*	*r*	*p*	*r*	*p*
Evaluating - Content	.64**	<.01	.77**	<.01	.70**	<.01
Evaluating - Mindset	.27	.09	.09	.59	.35*	.03
Evaluating – Style	-.05	.75	-.04	.82	.70**	<.01
Other - Additional Action	.17	.31	-.10	.53	-.06	.72
Other - Self-Direction	--	--	--	--	--	--
Reports of Non-Processes	.54**	<.01	.57**	<.01	.47**	<.01
Total Use of Processes	.63**	<.01	.46**	<.01	.54**	<.01

*$p < .05$. ** $p < .01$.

Table 8

Students' Use of Individual Processes: Significant Genre Differences

	Mauchly's Test			Huynh-Feldt	Test for Genre Differences			Pairwise Comparisons		
Process	χ^2	df	*p*	Estimates of Sphericity	*F*	df	*p*	Genre	Mean Difference	*P*
Evaluating Content	2.47	2	.29	--	7.52**	2, 78	< .01	procedural - biography	-0.43	0.28
								procedural - persuasive	0.63	0.07
								biography - persuasive	1.05**	< .01
Evaluating Mindset	8.79*	2	.01	0.86	8.03**	1.72, 67.17	< .01	procedural - biography	0.30*	.03
								procedural - persuasive	0.33**	< .01
								biography - persuasive	0.03	0.99
Integrating	1.31	2	.52	--	5.44**	2, 78	< .01	procedural - biography	-0.20*	.01
								procedural - persuasive	-0.08	.55
								biography - persuasive	1.25	.17
Interpreting	12.05**	2	< .01	0.81	17.06**	1.63, 63.47	< .01	procedural - biography	2.30**	< .01
								procedural - persuasive	2.15**	< .01
								biography - persuasive	-0.15	.99
Monitoring Problems	92.06**	2	< .01	0.53	14.25**	1.05, 40.96	< .01	procedural - biography	1.05**	< .01
								procedural - persuasive	1.10**	< .01
								biography - persuasive	0.05	.97

Table 8 (cont'd)

	Mauchly's Test			Huynh-Feldt Estimates of Sphericity	Test for Genre Differences			Pairwise Comparisons		
Process	χ^2	df	*p*		*F*	df	*p*	Genre	Mean Difference	*P*
Monitoring Processing	64.90**	2	< .01	0.55	24.28**	1.10, 43.21	< .01	procedural - biography	2.65**	< .01
								procedural - persuasive	2.68**	< .01
								biography - persuasive	0.03	0.99
Questioning	11.66**	2	< .01	0.82	16.56**	1.64, 63.87	< .01	procedural - biography	0.98**	< .01
								procedural - persuasive	1.08**	< .01
								biography - persuasive	0.10	.99
Repeating text	53.87**	2	< .01	0.58	10.09**	1.15, 44.82	< .01	procedural - biography	0.63**	< .01
								procedural - persuasive	0.55*	.02
								biography - persuasive	0.08	.55
Self-Direction	--	--	--	--	5.57**	2, 78	< .01	procedural - biography	0.25	.07
								procedural - persuasive	0.25	.07
								biography - persuasive	0.00	--
Summarizing	29.89**	2	< .01	0.66	3.98*	1.32, 51.50	< .05	procedural - biography	-0.30	.19
								procedural - persuasive	-0.85	.07
								biography - persuasive	-0.55	.38

*$p < .05$. ** $p < .01$.

Table 9

Students' Use of Processes: Genre by Grade Level - Biography

Students' Comprehension Processes	Biography			
	Second	Third	Fourth	Fifth
Total Use of Processes				
#	63	102	100	110
Percentage of Total Processes	16. 80%	27.20%	26.67%	29.33%
Mean (Per Text)	6.30	10.20	10.00	11.00
Individual Use of Processes				
Percentage of Total Reports	61.76%	79.69%	80.00%	83.97%
Kinds of Processes Used	13	16	14	14
The 5 Most Commonly Used Processes	Evaluating Content (15.87%) Inferencing (20.63%) Interpreting (20.63%) Predicting (7.94%) Summarizing (7.94%)	Evaluating Content (21.57%) Inferencing (18.63%) Interpreting (11.76%) Monitoring Processing (8.82%) Questioning (7.84%)	Evaluating Content (18.00%) Inferencing (19.00%) Interpreting (10.00%) Questioning (9.00%) Summarizing (9.00%)	Evaluating Content (39.09%) Inferencing (17.27%) Interpreting (4.55%) Questioning (12.73%) Text Reading (5.45%)
The 5 Least Commonly Used Processes	Activating Previous Knowledge (0.00%) Additional Action (0.00%)	Activating Previous Knowledge (0.00%) Additional Action (0.00%)	Activating Previous Knowledge (0.00%) Additional Action (0.00%)	Activating Previous Knowledge (0.00%) Elaborating (0.00%)

Table 9 (cont'd)

Students' Comprehension Processes	Biography			
	Second	Third	Fourth	Fifth
	Evaluating Mindset (1.59%) Monitoring Text Characteristics (0.00%) Self-Direction (0.00%)	Integrating (0.00%) Repeating text (0.00%) Self-Direction (0.00%)	Evaluating Mindset (0.00%) Monitoring Text Characteristics (0.00%) Repeating Text (0.00%)	Monitoring Text Characteristics (0.00%) Repeating Text (0.00%) Self-Direction (0.00%)
Reports of Non-Processes				
Percentage of Total Reports	38.24%	20.31%	20.00%	16.03%
I Don't Know	1.96%	0.00%	0.00%	0.00%
Not Thinking Anything	31.37%	16.41%	20.00%	15.27%
Unrelated Comments	4.90%	3.91%	0.00%	0.76%

Table 10

Students' Use of Processes: Genre by Grade Level – Persuasive Text

Students' Comprehension	Persuasive Text			
	Second	Third	Fourth	Fifth
Total Use of Processes				
#	55	94	95	119
Percentage of Total Processes	15.15%	25.90%	26.17%	32.78%
Mean (Per Participant)	5.50	9.40	9.50	11.90
Individual Use of Processes				
Percentage of Total Reports	58.51%	76.42%	74.80%	80.41%
Kinds of Processes Used	9	13	15	17
The 5 Most Commonly Used Processes	Evaluating Content (14.55%) Interpreting (20.00%) Monitoring Processing (14.55%) Predicting (12.73%) Summarizing (14.55%)	Evaluating Content (9.57%) Inferencing (26.60%) Interpreting (7.45%) Questioning (10.64%) Summarizing (13.83%)	Inferencing (24.73%) Interpreting (16.84%) Questioning (10.53%) Relating (8.42%) Summarizing (8.42%)	Evaluating Content (22.69%) Inferencing (17.65%) Interpreting (9.24%) Relating (8.40%) Summarizing (10.92%)
The 5 Least Commonly Used Processes	Evaluating Style (0.00%) Evaluating Mindset (0.00%)	Activating Previous Knowledge (0.00%) Evaluating Mindset (0.00%)	Activating Previous Knowledge (0.00%) Evaluating Mindset (0.00%)	Activating Previous Knowledge (0.00%) Evaluating Style (0.00%)

Table 10 (cont'd)

Students' Comprehension	Persuasive Text			
	Second	Third	Fourth	Fifth
	Integrating (0.00%) Monitoring Problems (0.00%) Self-Direction (0.00%)	Integrating (0.00%) Monitoring Problems (0.00%) Self-Direction (0.00%)	Monitoring Problems (0.00%) Monitoring Processing (0.00%) Self-Direction (0.00%)	Monitoring Processing (0.00%) Monitoring Problems (0.84%) Self-Direction (0.00%)
Reports of Non-Processes				
Percentage of Total Reports	41.49%	23.58%	25.20%	19.59%
I Don't Know	0.00%	0.81%	0.00%	0.00%
Not Thinking Anything	35.11%	20.33%	25.20%	18.92%
Unrelated Comments	6.38%	2.44%	0.00%	0.00%

Table 11

Students' Use of Processes: Genre by Grade Level – Procedural Text

Students' Comprehension	Procedural Text			
	Second	Third	Fourth	Fifth
Total Use of Processes				
#	87	204	164	174
Percentage of Total Processes	13.83%	32.43%	26.07%	27.66%
Mean (Per Text)	8.70	20.40	16.40	17.40
Individual Use of Processes				
Percentage of Total Reports	69.05%	85.00%	86.77%	87.82%
Kinds of Processes Used	13	15	17	13
The 5 Most Commonly Used Processes	Evaluating Content (10.34%) Interpreting (18.39%)	Evaluating Content (12.25%) Inferencing (5.88%)	Inferencing (10.98%) Interpreting (23.17%)	Evaluating Content (18.39%) Interpreting (22.41%)
	Monitoring Processing (26.69%) Predicting (9.20%) Questioning (14.94%)	Interpreting (18.63%) Monitoring Processing (29.41%) Questioning (10.78%)	Monitoring Problems (13.41%) Monitoring Processing (12.80%) Questioning (12.20%)	Monitoring Problems (7.47%) Monitoring Processing (13.22%) Questioning (9.77%)
The 5 Least Commonly Used Processes	Activating Previous Knowledge (0.00%) Elaborating (0.00%) Evaluating Style	Elaborating (0.00%) Evaluating Style (0.00%) Integrating	Activating Previous Knowledge (0%) Additional Action (0.61%) Elaborating	Additional Action (0.00%) Elaborating (0.00%) Evaluating Style

Table 11 (cont'd)

Students' Comprehension	Procedural Text			
	Second	Third	Fourth	Fifth
	(0.00%)	(0.00%)	(0.00%)	(0.00%)
	Integrating (0.00%) Monitoring Text Characteristics (0.00%)	Monitoring Knowledge (0.00%) Monitoring Text Characteristics (0.00%)	Integrating (0.00%) Monitoring Text Characteristics (0.00%)	Integrating (0.00%) Summarizing (0.00%)
Reports of Non-Processes				
Percentage of Total Reports	30.95%	15.00%	13.23%	12.12%
I Don't Know	0.00%	1.25%	0.00%	0.00%
Not Thinking Anything	24.60%	10.00%	13.23%	12.12%
Unrelated Comments	6.35%	3.75%	0.00%	0.00%

References

References

Afflerbach, P. (1990). The influence of prior knowledge on expert readers' main idea construction strategies. *Reading Research Quarterly, 25*, 31-46. Retrieved from http://www.reading.org/general/publications/journals/rrq.aspx

Afflerbach, P. (2000). Verbal reports and protocol analysis. In M. L. Kamil, P. B. Mosenthal, P. D. Pearson & R. Barr (Eds.), *Handbook of reading research* (Vol. III, pp. 163-179). Mahwah, NJ: Lawrence Erlbaum Associates.

Akiguet, S., & Piolat, A. (1996). Insertion of connectives by 9- to 11-year-old children in an argumentative text. *Argumentation, 10*, 253-270. Retrieved from http://www.springerlink.com/content/102850/

Anderson, R. C., & Pearson, P. D. (1984). A schema-theoretic view of basic processes in reading. In P. D. Pearson (Ed.), *Handbook of reading research* (Vol. 1, pp. 185-224). New York: Longman.

Armbruster, B. B., Anderson, T. H., & Ostertag, J. (1987). Does text structure/summarization instruction facilitate learning from expository text? *Reading Research Quarterly, 22*, 331-346. Retrieved from http://www.reading.org/general/publications/journals/rrq.aspx

Askehave, I., & Swales, J. (2001). Genre identification and communicative purpose: A problem and a possible solution. *Applied Linguistics, 22*, 195-212. doi: 10.1093/applin/22.2.195

Au, K. H. (1997). A sociocultural model of reading instruction: The Kamehameha Elementary Education Program. In S. A. Stahl & D. A. Hayes (Eds.), *Instructional models in reading* (pp. 181-202). Hillsdale, NJ: Erlbaum.

Baker, L., & Stein, N. L. (1981). The development of prose comprehension skills. In C. M. Santa & B. L. Hayes (Eds.), *Children's prose comprehension: Research and practice* (pp. 7-43). Newark, DE: International Reading Association.

Bakhtin, M. (1986). *Speech genres and other late essays.* (C. Emerson & M. Holquist, Eds.; V. McGee, Trans.). Austin: University of Texas Press.

Baumann, J. F., & Bergeron, B. S. (1993). Story map instruction using children's literature: Effects on first graders' comprehension of central narrative elements. *Journal of Reading Behavior, 25*, 407-437. doi: 10.1080/10862969309547828

Bawarshi, A. S., & Reiff, M. J. (2010). *Genre: An introduction to history, theory, research, and pedagogy*. Anderson, SC: Parlor Press.

Bazerman, C. (1988). *Shaping written knowledge: The genre and activity of the experimental article in science,* Madison, WI: University of Wisconsin Press.

Betts, E. A. (1946). *Foundations of reading instruction, with emphasis on differentiated guidance*. New York: American Book Company.

Brassart, D. G. (1996). Does a prototypical argumentative schema exist? Text recall in 8 to 13 year olds. *Argumentation, 10*, 163-174. Retrieved from http://www.springer.com/philosophy/logic+and+philosophy+of+language/journal/10503

Buss, K., & Karnowski, L. (2002). *Reading and writing nonfiction genres*. Newark, DE: International Reading Association.

Caswell, L. J., & Duke, N. K. (1998). Non-narrative as a catalyst for literacy development. *Language Arts, 75*, 108-117. Retrieved from http://www.ncte.org/journals/la

Chafe, W. (1980). The deployment of consciousness in the production of narrative. In W. Chafe (Ed.), *The pear stories: Cognitive, cultural, and linguistic aspects of narrative production* (pp. 9-50). Norwood, NJ: Ablex.

Chafe, W. (1985). Linguistic differences produced by differences between speaking and writing. In D. Olson, N. Torrance & A. Hildyard (Eds.), *Literacy, language, and learning: The nature and consequences of reading and writing* (pp. 105-122). Cambridge, MA: Cambridge University Press.

Chall, J. S. (1999). *Qualitative assessment of text difficulty: A practical guide for teachers and writers*. Brookline, MA: Brookline Books.

Chall, J. S., Jacobs, V. A., & Baldwin, R. S. (1990). *The reading crisis: Why poor children fall behind*. Cambridge, MA: Harvard University Press.

Dale, E., & Chall, J. S. (1948). A formula for predicting readability and instructions. *Educational Research Bulletin, 27*, January 21 and February 18, 1948, pp. 1911-1920, 1928, and 1937-1954. (Reprinted in pamphlet *Readability*. Columbus, OH: Ohio State University, 1948).

Dolz, J. (1996). Learning argumentative capacities: A study of the effects of a systematic and intensive teaching of argumentative discourse in 11-12 year old children. *Argumentation, 10*, 227-251. Retrieved from http://www.springer.com/philosophy/logic+and+philosophy+of+language/journal/10503

Donahue, P. L., Daane, M. C., & Jin, Y. (2005). *The Nation's Report Card: Reading 2003*. Retrieved from http://nces.ed.gov/Pubsearch/pubsinfo.asp?pubid=2005453

Donovan, C. A. (2001). Children's development and control of written story and informational genres: Insights from one elementary school. *Research in the Teaching of English, 35*, 394-447. Retrieved from http://www.ncte.org/journals/rte

Dubrow, H. (1982). *Genre*. New York: Methuen.

Duke, N. K. (2000). 3.6 minutes per day: The scarcity of informational text in first grade. *Reading Research Quarterly, 35*, 202-224. doi: 10.1598/RRQ.35.2.1

Duke, N. K. (2005). Comprehension of what for what: Comprehension as a non-unitary construct. In S. Paris & S. Stahl (Eds.), *Current issues in reading comprehension and assessment* (pp. 93-104). Mahwah, NJ: Erlbaum.

Duke, N. K., & Bennett-Armistead, V. S. (2003). *Reading and writing informational text in the primary grades*. New York: Scholastic.

Duke, N. K., & Kays, J. (1998). "Can I say 'once upon a time'?": Kindergarten children developing knowledge of information book knowledge. *Early Childhood Research Quarterly, 13*, 295-318. Retrieved from http://www.elsevier.com/wps/find/journaldescription.cws_home/620184/description

Duke, N. K., & Roberts, K. M. (2010). The genre-specific nature of reading comprehension. In D. Wyse, R. Andrews & J. Hoffman (Eds.), *The Routledge international handbook of English language and literacy teaching* (pp. 74-86). London: Routledge.

Ehri, L. C., & McCormick, S. (2004). Phases of word learning: Implications for instruction with delayed and disabled readers. In R. B. Ruddell & N. J. Unrau (Eds.), *Theoretical models and processes of reading* (5th ed., pp. 365-389). Newark, DE: International Reading Association.

Englert, C. S., & Mariage, T. V. (1991). Making students partners in the comprehension process: Organizing the reading "POSSE". *Learning Disability Quarterly, 14*, 123-138. Retrieved from http://www.cldinternational.org/Publications/LDQ.asp

Entwisle, D. R., & Astone, N. M. (1994). Some practical guidelines for measuring youth's race/ethnicity and socioeconomic status. *Child Development, 65*, 1521-1540. doi: 10.1111/j.1467-8624.1994.tb00833.x

Ericsson, K. A., & Simon, H. A. (1993). *Protocol analysis: Verbal reports as data*. Cambridge, MA: MIT Press. (Original work published 1984).

Flood, J., & Lapp, D. (1986). Types of texts: The match between what students read in basals and what they encounter in tests. *Reading Research Quarterly, 21*, 284-297. Retrieved from http://www.reading.org/General/Publications/Journals/RRQ.aspx

Flowerdew, J. (2002). Genre in the classroom: A linguistic approach. In A. M. Johns (Ed.), *Genre in the classroom: Multiple perspectives* (pp. 91-102). Mahwah, NJ: Lawrence Erlbaum.

Gall, M. D., Gall, J. P., & Borg, W. R. (2007). *Educational research: An introduction* (8th ed.). New York: Pearson Education.

Gersten, R., Fuchs, L. S., Williams, J. P., & Baker, S. (2001). Teaching reading comprehension strategies to students with learning disabilities: A review of research. *Review of - Educational Research, 71*, 279-320. doi: 10.3102/00346543071002279

Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Chicago: Aldine.

Gott, R. (2005). *Astronauts take flight*. Parsippany, NJ: Celebration Press.

Guthrie, J. T., Wigfield, A., Barbosa, P., Perencevich, K. C., Taboada, A., Davis, M. H., et al. (2004). Increasing reading comprehension and engagement through Concept-Oriented Reading Instruction. *Journal of Educational Psychology, 96*, 403-423. doi: 10.1037/0022-0663.96.3.403

Harvey, S., & Goudvis, A. (2009). *The primary comprehension toolkit*. Portsmouth, NH: FirstHand. Retrieved from http://www.comprehensiontoolkit.com/gradek_2/default.asp

Harwell, M., & LeBeau, B. (2010). Student eligibility for a free lunch as an SES measure in education research. *Educational Researcher, 39*, 120-131. doi: 10.3102/0013189X10362578

Hasbrouck, J. E., & Tindal, G. A. (2006). Oral reading fluency norms: A valuable assessment tool for reading teachers. *The Reading Teacher, 59*, 636-644. doi: 10.1598/RT.59.7.3

Hidi, S. E., & Hildyard, A. (1983). The comparison of oral and written productions in two discourse types. *Discourse Processes, 6*, 91-105. Retrieved from http://www.tandf.co.uk/journals/titles/0163853X.asp

Hiebert, E. H. (1999). Text matters in learning to read. *The Reading Teacher, 52*, 552-566. Retrieved from http://www.reading.org/General/Publications/Journals/RT.aspx

Hilden, K. (2008). *Process-oriented assessment tools for studying second graders' informational comprehension.* (Unpublished doctoral dissertation). Michigan State University, East Lansing, MI.

Hilden, K., & Pressley, M. (2011). Verbal protocols of reading. In N. K. Duke & M. H. Mallette (Eds.), *Literacy research methodologies* (2nd ed., pp. 427-481). New York: Guilford.

Idol, L., & Croll, V. J. (1987). Story-mapping training as a means to improve reading comprehension. *Learning Disability Quarterly, 10*, 214-229. Retrieved from http://www.cldinternational.org/Publications/LDQ.asp

Jetton, T. (1994). Information-driven versus story-driven: What children remember when they are read informational stories. *Reading Psychology: An International Quarterly, 15*, 10-130. Retrieved from http://www.tandf.co.uk/journals/authors/urpyauth.asp

Jimenez, L., & Duke, N. K. (under review). *Interest matters: Fourth-graders reading multiple high- and low-interest texts*.

Kafka, T. (2005). *Charting your course*. Parsippany, NJ: Celebration Press.

Kamberelis, G. (1999). Genre development and learning: Children writing stories, science reports, and poems. *Research in the Teaching of English, 33*, 403-460. Retrieved from http://www.ncte.org/journals/rte

Kamil, M. L., Intrator, S. M., & Kim, H. S. (2000). The effects of other technologies on literacy and literacy learning. In M. L. Kamil, P. B. Mosenthal, P. D. Pearson & R. Barr (Eds.), *Handbook of reading research* (Vol. 3, pp. 771-788). Mahwah, NJ: Lawrence Earlbaum.

Kinneavy, J. L. (1972). *A theory of discourse: The aims of discourse*. Englewood Cliffs, NJ: Prentice Hall.

Kucan, L., & Beck, I. L. (1996). Four fourth graders thinking aloud: An investigation of genre effects. *Journal of Literacy Research, 28*, 259-287. doi: 10.1080/10862969609547921

Langer, J. A. (1986). *Children reading and writing: Structures and strategies*. Norwood, NJ: Ablex Publishing.

Leal, D. J. (1993). *A comparison of third grade children's listening comprehension of scientific information using an information book and an informational storybook*. Paper presented at the Annual Meeting of the National Reading Conference, Charleston, SC (ERIC Document Reproduction Service No. ED365954).

Lee, J., Grigg, W., & Donahue, P. (2007). *The nation's report card: Reading 2007 (NCES 2007-496)*. National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education, Washington, D.C. Retrieved from http://nces.ed.gov/pubSearch/pubsinfo.asp?pubid=2007496

Leu, D. J., Kinzer, C. K., Coiro, J. L., & Cammack, D. W. (2004). Toward a theory of new literacies emerging from the Internet and other information and communication technologies. In R. B. Ruddell & N. J. Unrau (Eds.), *Theoretical models and processes of reading* (5th ed., pp. 1570-1613). Newark, DE: International Reading Association.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage.
Michigan Department of Education. (2005). K-8 GLCE English Language Arts looking across the grades document. Retrieved from http://www.michigan.gov/documents/ELA_Whole_Folder_144868_7.pdf

Miller, C. R. (1984). Genre as social action. *Quarterly Journal of Speech, 70*, 151-167. Retrieved from www.tandf.co.uk/journals/rqjs

Moss, B. (2008). The information text gap: The mismatch between non-narrative text types in basal readers and 2009 NAEP recommended guidelines. *Journal of Literacy Research, 40*, 201-219. doi: 10.1080/10862960802411927

Moss, B., & Loh, V. S. (2010). *35 strategies for guiding readers through informational texts*. New York: Guilford.

Mullis, I. V. S., Martin, M. O., Kennedy, A. M., & Foy, P. (2007). *PIRLS 2006 international report: IEA's Progress in International Reading Literacy Study in primary schools in 40 countries*. Chestnut Hill, MA: International Association for the Evaluation of Educational Achievement. Retrieved from http://timss.bc.edu/pirls2006/intl_rpt.html

National Assessment Governing Board. (2008). *Reading framework for the 2009 National Assessment of Educational Progress.* Retrieved from http://www.nagb.org/publications/frameworks/reading09.pdf

National Center for Education Statistics. (2007). *Literacy in everyday life: Results from the 2003 National Assessment of Adult Literacy*. Retrieved from http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2007480

National Center for Education Statistics. (2007-2008). *Search for schools, colleges, and libraries*. Retrieved from http://nces.ed.gov/globallocator

National Governors Association & Council of Chief State School Officers. (2010). *Common core state standards for English Language Arts & literacy in history/social studies, science, and technical subjects*. Retrieved from http://www.corestandards.org/the-standards/english-language-arts-standards

Olshavsky, J. E. (1966/1977). Reading as problem solving: An investigation of strategies. *Reading Research Quarterly, 12*, 654-674. Reading Research Quarterly, 637, 428-465. Retrieved from http://www.reading.org/general/publications/journals/rrq.aspx

Olson, G. M., Mack, R. L., & Duffy, S. A. (1981). Cognitive aspects of genre. *Poetics, 10*, 283-315. Retrieved from http://www.elsevier.com/wps/find/journaldescription.cws_home/505592/description#description

Pappas, C. C. (1991). Young children's strategies in learning the "book language" of information books. *Discourse Processes, 14*, 203-225. Retrieved from Retrieved from http://www.tandf.co.uk/journals/titles/0163853X.asp

Pappas, C. C. (1993). Is narrative "primary"? Some insights from kindergarterners' pretend readings of stories and information books. *Journal of Reading Behavior, 25*, 97-129. doi: 10.1080/10862969309547803

Paré, A., & Smart, G. (1994). Observing genres in action: Towards a research methodology. In A. Freedman & P. Medway (Eds.), *Genre and the new rhetoric*. London: Taylor and Francis.

Paris, S. G. (2005). Reinterpreting the development of reading skills. *Reading Research Quarterly*, *40*, 184-202. doi: 10.1598/RRQ.40.2.3

Park, Y. (2008). Patterns in and predictors of elementary students' reading performance: Evidence from the data of the Progress in International Reading Literacy Study 2006. (Unpublished doctoral dissertation). Michigan State University, East Lansing, MI.

Piaget, J. (1954). *The construction of reality in the child*. New York: Basic Books.

Piaget, J. (1971). *The construction of reality in the child*. New York: Ballantine.

Pressley, M., & Afflerbach, P. (1995). *Verbal protocols of reading: The nature of constructively responsive reading*. Hillsdale, NJ: Erlbaum.

Pressley, M., & Hilden, K. (2004). Verbal protocols of reading. In N. K. Duke & M. H. Mallette (Eds.), *Literacy research methodologies* (pp. 308-321). New York: Guilford.

Pritchard, R. (1990). The effects of cultural schemata on reading processing strategies. *Reading Research Quarterly, 25*, 273-295. Retrieved from http://www.reading.org/General/Publications/Journals/RRQ.aspx

Purcell-Gates, V., Duke, N., & Martineau, J. A. (2007). Learning to read and write genre-specific text: Roles of authentic experience and explicit teaching. *Reading Research Quarterly, 42*, 8-45. doi: 10.1598/RRQ.42.1.1

RAND Reading Study Group. (2002). *Reading for understanding: Toward an R&D program in reading comprehension*. Santa Monica, CA: Rand Education. Retrieved from http://www.rand.org/multi/achievementforall/reading/readreport.html

Robinson, H. A., Faraone, V., Hittleman, D. R., & Unruh, E. (1990). *Reading comprehension instruction 1783-1987: A review of trends and research*. Newark, DE: International Reading Association.

Rosenblatt, L. M. (1994). *The reader, the text, the poem: The transactional theory of the literary work*. Carbondale, IL: Southern Illinois University Press. (Original work published 1978).

Ruddell, R. B., & Unrau, N. J. (1994). Reading as a meaning-construction process: The reader, the text, and the teacher. In R. B. Ruddell, M. R. Ruddell & H. Singer (Eds.), *Theoretical models and processes of reading* (4th ed., pp. 996-1056). Newark, DE: International Reading Association.

Saine, P., & Webster, P. S. (2010, April). *Reading strategies to enhance comprehension of informational texts and biographies of African American heroes of the American*

Revolution. Paper presented at the annual meeting of the International Reading Association, Chicago.

Smith, M. C. (2000). The real-world reading practices of adults. *Journal of Literacy Research, 32*, 25-52. doi: 10.1080/10862960009548063

Spache, G. D. (1974). The Spache readability formula. In G. D. Spache (Ed.), *Good reading for poor readers*. Champaign, IL: Garrard Publishing.

Stein, N. L., & Albro, E. R. (2001). The origins and nature of arguments: Studies in conflict understanding, emotion, and negotiation. *Discourse Processes, 32*, 113-133. doi: 10.1080/0163853X.2001.9651594

Stein, N. L., & Glenn, C. G. (1979). An analysis of story comprehension in elementary school children. In R. O. Freedle (Ed.), *New directions in discourse processing* (pp. 53-120). Norwood, New Jersey: Ablex.

Stein, N. L., & Policastro, M. (1984). The concept of a story: A comparison between children's and teacher's viewpoints. In H. Mandl, N. L. Stein & T. Trabasso (Eds.), *Learning and comprehension of text* (pp. 113-155). Hillsdale, NJ: Lawrence Erlbaum.

Stemler, S. (2001). An overview of content analysis. *Practical Assessment, Research & Evaluation, 7*(17). Retrieved from http://www.pareonline.net/getvn.asp?v=7&n=17

Stewart, S. (2005). *Save our Earth*. Parsippany, NJ: Celebration Press.

Strauss, A. L., & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (2nd ed.). Thousand Oaks, CA: Sage.

Taylor, B. M. (1980). Children's memory for expository text after reading. *Reading Research Quarterly, 15*, 399-411. Retrieved from http://www.reading.org/General/Publications/Journals/RRQ.aspx

Venezky, R. L. (2000). The origins of the present-day chasm between adult literacy needs and school literacy instruction. *Scientific Studies of Reading, 4*, 19-39. doi: 10.1207/S1532799XSSR0401_3

Vygotsky, L. S. (1978). *Mind in society: Development of higher psychological processes*. (M. Cole, V. John-Steiner, S. Scribner, & E. Souberman, Eds.). Cambridge, MA: Harvard University Press.

Vygotsky, L. S. (1993). *The collected works of L.S. Vygotsky: Vol 2* (J. Knox & C. Stevens, Trans.). New York: Plenum Press.

Williams, J. P., Hall, K. M., Lauer, K. D., Stafford, B., DeSisto, L. A., & deCani, J. S. (2005). Expository text comprehension in the primary grade classroom. *Journal of Educational Psychology, 97*, 538-550. doi: 10.1037/0022-0663.97.4.538

Williams, J. P., Nubla-Kung, A. M., Pollini, S., Stafford, B. K., Garcia, A., & Snyder, A. E. (2007). Teaching cause-effect text structure through social studies content to at-risk second graders. *Journal of Learning Disabilities, 40*, 111-120. Retrieved from http://ldx.sagepub.com

Zecker, L. B. (1996). Early development in written language: Children's emergent knowledge of genre-specific characteristics. *Reading and Writing: An Interdisciplinary Journal, 8*, 5-25. Retrieved from http://www.tandf.co.uk/journals/titles/10573569.asp

Zecker, L. B. (1999). Different texts, different emergent writing forms. *Language Arts, 76*, 483-490. Retrieved from http://www.ncte.org/journals/la

MANUSCRIPT TWO: LESSONS FROM U.S. ELEMENTARY STUDENTS: READING BIOGRAPHY, PERSUASIVE TEXT, AND PROCEDURAL TEXT

Abstract

Informational texts are an important part of the U.S. elementary curriculum. Three types of informational text that may be found in elementary classrooms are biography, persuasive text, and procedural text. In a recent study, on-grade-level elementary readers reported using an approach to comprehending biography and persuasive text that differed from their reported uses of processes when comprehending procedural text. Elementary informational text comprehension instruction and assessment may need to attend more explicitly to multiple types of informational text. This article presents nine ways to recognize and include multiple informational genres in the elementary classroom.

Lessons from U.S. Elementary Students:

Reading Biography, Persuasive Text, and Procedural Text

"Clean water is one of the most important natural resources on Earth. No living creatures can survive without it. Plants would wither and…" (Stewart, 2005, p. 12). With these sentences, Corey began reading aloud from *Save Our Earth*, a persuasive text designed to convince readers to conserve natural resources. As the fourth grader read the five-page chapter about protecting Earth's fresh water, Corey also thought aloud. For example, the student said:

- *"I can also see the title says you need water to live. So I'm guessing that it's about how water helps us live."*
- *"So far I'm thinking that a lot of things you don't think about we use water for, like even for cooking."*
- *"There's only three percent of the Earth's water that is fresh water, and you can only drink fresh water. Otherwise that will make us really, really sick."*
- *"I can see that some harmful bacteria gets into water, and, if we drink that, that's another way to get sick."*
- *"I never really thought about how many ways water is used. Sometimes when you're reading through you can find out new things."*

A few minutes later, Eric read aloud, "Use a cardboard triangle to help you draw two parallel diagonal lines. One line should be near the top of the carton and…" (Kafka, 2005, p. 20). As the fourth grader read the three-page procedural text from *Charting Your Course* and as he constructed a periscope, the student also reported his thinking. Eric's comments included:

- *"I'm feeling excited because this is my first time I'm going to be making one of these."*

- *"I need to be closer to the carton."*
- *"So, cut this. I'll just draw it. Okay."*
- *"Okay, got it. Oh, it's too low. Yeah, it's too low to go in that one. Okay."*
- *"You would just put one right there. Then put the hole right there. Then make it like the mirrors opposite and..."*

These two on-grade-level readers were using various mental processes to make meaning from these informational texts. During a recent study, I recorded their (and many other elementary students') reported uses of comprehension processes, and they taught me important lessons about how U.S. elementary students comprehend different types of informational texts.

In this article, I share what I learned from these elementary students. First, I revisit current conceptions of informational text comprehension. Then I describe how the students in my study comprehended biography, persuasive texts, and procedural texts. Lastly, I discuss what their reported use of processes may mean for teaching with informational texts in the elementary grades. On-grade-level readers' reports can help us gain insights into teaching and assessing U.S. elementary students' informational text comprehension.

Rethinking Informational Text Comprehension

Informational Texts in U.S. Elementary Classrooms

Today, informational texts, or written discourses designed to share information, teach skills, and convince, are an increasingly important part of U.S. elementary curricula. The Common Core State Standards (National Governors Association & Council of Chief State School Officers [NGA & CCSO], 2010) specifically mandate attention to informational texts during literacy instruction. The informational text standards require that K-5 students learn to:

- "Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect" (p. 14).
- "Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently" (p. 14).
- "Compare and contrast the most important points and key details presented in two texts on the same topic" (p. 14).

High-stakes assessments also require students to read informational texts. For instance, the National Assessment Governing Board [NAGB] (2008) recommended that informational texts comprise 50% of the fourth-grade passages for the 2009 *National Assessment of Educational Progress* [NAEP]. They argued that this percentage reflected "the kinds of texts that students read across the curriculum" and "the distribution of text types on many state reading tests" (p. 11).

In addition, U.S. elementary classroom lessons may include informational texts (e.g., Dean & Small, 1997; Duthie, 1994). For example, teachers can use persuasive and procedural texts in science lessons, biography and speeches in social studies lessons, and narrative nonfiction and exposition in integrated literacy lessons. Basal reading programs may also feature informational texts. Barbara Moss (2008) found that two widely-used basal reading programs asked U.S. elementary students to read informational texts 40% of the time. She noted that this percentage has risen steadily in the last two decades.

U.S. state learning standards, high-stakes tests, and resources may focus on informational texts because they are ubiquitous in adulthood (Smith, 2000; Venezky, 2000). For instance, the adults in one study devoted an average of 2.7 hours to reading (and writing) informational texts

each day (White, Chen, & Forsyth, 2010). To be successful, U.S. students will need to learn how to comprehend informational texts, and their learning begins in the youngest grades.

Reading Comprehension

According to the RAND Reading Study Group (2002), students comprehend written text by simultaneously recreating the author's original meaning *and* using their background experiences to add additional meanings. They carry out cognitive operations or mental processes to help them comprehend text. Students may, for example, make connections to their background experiences, generate inferences about what the author is saying, and summarize the main ideas of the text (Pressley & Afflerbach, 1995). As students make meaning, many factors may influence their comprehension. Figure 1 summarizes these factors.

As Figure 1 shows, the text influences students' comprehension (RAND Reading Study Group, 2002). Elements of the text, such as its content, vocabulary, and style, can constrain or enhance students' meaning making. For example, students are likely to comprehend written text better when their oral vocabularies contain most or all of the words used in the written text. When students' knowledge and skills do not match well, accessing and make meaning from the written text may be difficult.

One element of the text that may influence students' comprehension is its genre. A genre is a "a distinctive profile of regularities across four dimensions: a set of texts, the composing processes involved in creating these texts, the reading practices used to interpret them, and the social roles performed by writers and readers" (Paré & Smart, 1994, p. 147). Although genre conceptions have changed over time and scholars hold differing perspectives that may variously emphasize the texts' form and features or the social contexts of reading and writing (e.g., Dubrow, 1982; Johns, 2002), this definition of genre honors both conventional and contemporary

wisdom. It acknowledges historical beliefs in the importance of the texts' characteristics as well as recent insights about the roles of readers, writers, and their surrounding social contexts in genre production and use.

According to Paré & Smart's (1994) definition, genres are products of complex interactions among multiple factors, with readers' and writers' goal-driven activity shaping the characteristics of specific genres. Writers compose and readers read texts to accomplish goals. Writer's purposes and knowledge of their anticipated audience influence their decisions. When teaching readers how to construct an art project, they might use simple language and syntax, single-step blocks of instructions, and a demonstrative graphic for each step for young children and complexly-written, multistep directions that contain few graphics for adult readers. Readers' purposes and knowledge of the writer and text in turn affect their meaning-making decisions. For example, readers' goals may lead them to choose to slowly read the text front-to-back, skim through the first and last chapter, or use the index to go straight to the section that is most likely to help them accomplish their goal. Because texts reflect the writers' and readers' goal-driven decision-making, similar goals can lead to texts with shared purposes and characteristics (Paré & Smart, 1994). These similarities in purposes define individual genres and shape the features of each type of text.

Some researchers have proposed that genre has a wider-reaching influence on students' comprehension activity than previously understood (Duke & Roberts, 2010). They have found that readers modify their expectations and uses of processes for different types of texts. Readers, for example, use different approaches to comprehend narrative and informational texts (Kucan & Beck, 1996; Olson, Mack, & Duffy, 1981). With narrative texts, they focus on upcoming events, think about the whole text, and use processes such as inferencing, predicting, and summarizing.

With informational texts, readers focus on nearby pieces of information, work to understand each of the author's ideas, and use elaborating, interpreting, relating, and other processes.

Comprehending Multiple Types of Informational Text

When U.S. students are asked to comprehend informational texts, they may be expected to read more than one type of text (e.g., Davis & Tonks, 2004; Purcell-Gates, Duke, & Martineau, 2007). For example, the Common Core State Standards identify "personal essays, speeches, opinion pieces, essays about art or literature, biographies, memoirs, journalism, and historical, scientific, technical, or economic accounts (including digital sources) written for a broad audience" as informational texts (NGA & CCSSO, 2010, p. 57). The 2009 NAEP contains three types of informational text: *exposition*, *argumentation and persuasive text*, and *procedural text or documents* (NAGB, 2008). In Barbara Moss' (2008) study, basal reading programs incorporated narratives, poetry, plays, literary nonfiction, and three types of informational text (exposition, argumentation and persuasive texts, and procedural text or documents).

Informational texts may have various purposes and characteristics (e.g., Buss & Karnowski, 2002; Mooney, 2001). For example, the NAGB (2008) suggests that:

- "exposition presents information, provides explanations and definitions, and compares and contrasts,"
- "argumentation seeks to influence through appeals that direct readers to specific goals or try to win them to specific beliefs," and
- "procedural texts convey information in the form of directions for accomplishing a task" (p. 10).

According to the NAGB, these informational texts share many features, such as *titles*, *subheadings*, *sidebars*, and *photos and illustrations*. The texts also have unique features, such as

contrasting perspectives and *presentation of the argument* in argumentation and persuasive texts or *procedures* in procedural texts (pp. 22-26).

Because informational texts may include texts with varying purposes and features, U.S. elementary students may not use the same approach to comprehend all types of informational texts – a possibility that my study explored. In my study, on-grade-level readers from second- through fifth-grade classrooms read biography, persuasive texts, and procedural texts. They shared their thinking before, during, and after reading each informational text. (A detailed report of the methods and results are available in Martin, 2011).

Lessons Learned

Corey, Eric, and the other on-grade-level elementary students in my study offer important lessons about how U.S. elementary students comprehend informational text. Most notably, their reported uses of processes suggest that U.S. elementary students who are reading on-grade-level do not use one universal approach when they comprehend informational texts. Instead, they differentiate their comprehension across at least some informational genres.

Biography and Persuasive Texts

Biography and persuasive texts have often been identified as informational texts (e.g., Michigan Department of Education [MDE], 2005; NGA & CCSO, 2010). U.S. elementary students may encounter these texts in social studies, science, and integrated literacy lessons. For example, they may read accounts of the lives of famous U.S. citizens or scientists. Students may also explore others' stances when they are studying current events and global issues.

Biography. Biography shares the life experiences of others. It is an "account of a person's life written by another person" (NAGB, 2008, p. 59). Figure 2 identifies some contemporary examples of biography that are appropriate for second- through fifth-grade

students. These informational texts have many common characteristics (Cullinan & Galda, 1998; Herman, 1978; Mooney, 2001). For instance, they are often intended to teach children about individuals who have impacted others' lives. Biography describes people's lives in the context of the time period and culture in which they lived. The texts are typically written in the third person and include many details about individuals' accomplishments, histories, and personalities. These informational texts may be organized chronologically, by episode, or to play up a specific interpretation. They may contain an explicit or implicit theme and are informed by careful and thorough research (sometimes shown through citations, footnotes, or explanatory notes). Lastly, biography may include chapter headings, dialogue, genealogy charts, illustrations, photographs, and/or timelines.

Persuasive text. Persuasive text attempts to "convince an audience or to prove or refute a point of view or an issue" (NAGB, 2008, p. 63). Figure 2 includes examples of grade-level-appropriate persuasive texts. These texts share several typical elements (MDE, 2005; NAGB, 2008; Toulmin, 1958). The texts are usually intended to convince children that a viewpoint or action is correct, true, and/or valuable. They typically include an introduction, body, and conclusion. Persuasive texts may have a clear and focused claim, support for the claim, and other elements, such as warrants (explications of the connection between claim and support) and objections (explications of why the claim may not right or important). These informational texts may use many kinds of support, including examples, facts, testimonials, and stories, and may directly address or refute objections with statements and evidence. Persuasive texts may contain a variety of text structures, such as causal, comparative, and/or problem and solution. They may have attention-getting openers, varied sentence types, and transitions to signal connections,

refutations, and new lines of reasoning (e.g., *as well as, however, in addition, furthermore*). Finally, the texts may include illustrations, tables, subheadings, and other graphical features.

Comprehending biography and persuasive texts. Corey, Eric, and the other elementary students in my study used similar approaches to comprehend both biography and persuasive texts. The on-grade-level readers reported using 21 types of processes (Pressley & Afflerbach, 1995), but they favored five of them when they read these two types of informational texts. The most commonly-used processes were:

- *Inferencing.* When students make inferences, they draw conclusions about information not explicitly stated in the text. Often, students use inferences to "fill" in information that authors have omitted, define unknown words, and determine the motivations of people featured in the text.
- *Evaluating content.* Students comment on their feelings when they evaluate content during reading. This talk can focus on specific ideas or the text's overall quality.
- *Interpreting.* Students who make interpretations draw conclusions about the meaning of explicitly-stated ideas that do not go beyond what is already in the text or graphics. They often focus on understanding specific statements and pictures.
- *Questioning.* Students interrogate the text. They may focus on a not-yet-understand aspect of the text or graphics, the text's real-world applications, or their reading experience.
- *Summarizing.* To summarize text, students use their own words to recount the events or information in the text. They may focus on the most recently-read sentence and/or information they have read earlier. Students' reports may include specific details and/or the text's overarching message.

Figure 3 provides examples of each comprehension process.

Procedural Texts

U.S. elementary students often encounter procedural texts in fine arts, science, and integrated literacy units. For instance, they may read and use procedural texts to conduct scientific experiments, construct measuring tools, or complete craft projects.

Procedural text teaches others how to make or do something. It "conveys information in the form of directions for accomplishing a task" (NAGB, 2008, p. 63). Figure 2 identifies some procedural texts that may be used in the elementary grades. These texts include several common characteristics (Mooney, 2001; NAGB, 2008; Purcell-Gates, et al., 2007). For instance, the texts are intended to teach children how to accomplish a goal, activity, and/or investigation that they do not yet know how to do. They typically include a goal statement, materials section, and series of sequential steps. Procedural texts usually describe materials and procedures in clear and explicit detail. They typically signal steps in order of occurrence through demarcations (e.g., new lines of text) and the use of numbers or other codes. The texts are usually written in the second person perspective, include imperative verbs, and use present and future verb tenses. They may contain a final evaluation and a graphic of the finished product. Procedural texts may also support readers by including demonstrative graphics, specific hints, and scientific explanations. Lastly, they may include captions, headings, subheadings, sidebars, legends, and other graphical features.

To comprehend procedural texts, Corey, Eric, and the other elementary students in my study adopted an approach that differed from the one they used to comprehend biography and persuasive texts. The on-grade-level readers sometimes reported using the same processes, but

they also used five other processes much more often when they read the procedural text. These were (drawn in part from Pressley & Afflerbach, 1995):

- *Self-direction.* Students command themselves to do something when they self-direct. In procedural texts, this may focus on the next action in a series of steps. Self-directions can help students to build projects and work toward other reading goals.
- *Repeating text.* Students use the same words that are written in the text to say what they just read when they repeat text. For procedural texts, students may focus on individual actions in a step that describes multiple actions.
- *Monitoring problems.* Students talk about the obstacles they encounter and solutions they use during reading when they monitor problems. Their reports may center on their executions of the directions in a procedural text. Students' comments may also involve students' selected reading pace, encounters with unknown words, comprehension breakdowns, and ineffective reading behaviors.
- *Monitoring processing.* When students monitor their processing, they comment on their own thinking. They may discuss whether or not they understand the procedural text. Students' reports may also focus on their reading purposes and behaviors, use of comprehension processes, and reading progress.
- *Evaluating mindset.* When students evaluate their mindset, they assess their own attitude toward the text before reading. This process enables students to recognize and address factors that may influence their ability to achieve their reading goals, such as difficulty of the project or lack of interest in the topic or trust in the writer.

Figure 4 provides examples of on-grade-level readers' use of each comprehension process.

Informational Text Comprehension Instruction and Assessment

The lessons learned from Corey, Eric, and the other elementary students in my study have implications for practice. Aligning U.S. instructional practices to elementary on-grade-level readers' comprehension activity means acknowledging the differences observed among their reported use of comprehension processes for different types of informational text.

Today, U.S. instructional practices recognize that readers will comprehend stories or fictional narratives differently than informational texts. For example, elementary teachers may use story grammar instruction to teach narrative text comprehension (e.g., Baumann & Bergeron, 1993). To teach informational text comprehension, teachers may focus instead on compare-contrast and other frequently-used informational text structures (e.g., Williams, et al., 2005). The Common Core State Standards also dedicate separate learning standards to narrative and informational texts (NGA & CCSSO, 2010), and the 2009 NAEP Reading Framework asks fourth graders to comprehend both types of text (NAGB, 2008).

In my study, Corey, Eric, and their peers reported adopting two different approaches to read the three featured informational genres. Their reported uses of comprehension processes suggest that matching instruction to on-grade-level elementary students' comprehension activity may involve moving beyond teaching "narrative text comprehension" and "informational text comprehension." To judge by the on-grade-level readers in my study, focusing on one universal approach to comprehending informational texts may match what elementary students do with some genres but not others, possibly confusing students or slowing their progress.

In short, the lessons learned from Corey, Eric, and their peers suggest that U.S. elementary instruction and assessment may also need to acknowledge that differences exist even within "informational text" comprehension. As my colleagues and I argue elsewhere:

> We need to think specifically about how to teach reading and writing procedural or how-to text, for example, and recognize that this is going to be different in many important ways from how we teach reading and writing personal narratives, for example. It's not just "comprehension" or "composition" anymore. It's comprehension *of what for what* and composition *of what for what*. (Duke, Caughlan, Juzwik, & Martin, in press, p. 8)

To reflect the differences observed among U.S. elementary on-grade-level readers' approaches to informational text, more genre-specific approaches to U.S. elementary teaching and testing may be needed. In other words, we need to recognize that informational text comprehension is multi-faceted and provide opportunities for students to become familiar with and learn to read multiple informational genres.

Nine ways to acknowledge differences in and promote elementary students' uses of comprehension processes with different types of informational text are listed below.

Stocking the Shelves with Different Types of Informational Texts

Adding books and magazines to the classroom library offers elementary students the opportunity to gain experience reading a variety of informational texts. Students can begin to learn about the typical purposes and characteristics of each informational genre and practice their comprehension skills, and they may enjoy reading biography, exposition, narrative nonfiction, persuasive texts, procedural texts, personal essays and speeches, and other informational genres. To find informational texts for elementary students, Figure 2 and resources such as the Database of Award-Wining Children's Literature (http://www.dawcl.com/), the NCTE Orbis Pictus Award for Outstanding Nonfiction for Children website (http://www.ncte.org/awards/orbispictus), or *Reading and Writing Nonfiction Genres* (Buss & Karnowski, 2002) may be helpful.

Sharing Your Experiences with Different Types of Informational Texts

We read different types of informational texts constantly. For example, in the last twelve hours, I:

- used a cookbook to prepare dinner;
- read a newspaper that contained feature articles, letters to the editor, obituaries, and other informational texts to learn about what had happened during the day;
- scanned several informational websites to learn which vacuum would be the best to buy;
- studied an advertising circular to find gift ideas for my mother's upcoming birthday;
- skimmed a recently-purchased exercise book to find new yoga poses for my workout;
- checked the informational leaflet that came with a medical prescription to make sure it would not interact adversely with the other medicines my younger sister had already taken;
- and read the directions in my new home dry-cleaning kit to wash my work clothes.

Sharing these experiences with our students can help them to see that different types of informational text are useful in daily life and may encourage some students to use the genres for their own purposes. These experiences can, for example, be discussed during content area activities, added to the texts we compose during Writing Workshop mini-lessons, offered as supporting examples when we advise students, used as read-alouds, and written on the school's "What Our Teachers are Reading" poster.

Including Different Types of Informational Texts in Daily Routines

Students learn by watching and imitating the adults around them. Using different types of informational text to accomplish daily teaching tasks can be a powerful way to expose

students to and teach them the purpose of different informational genres. We can, for instance, read:

- procedural texts, such as how to complete the start-of-day business or operate the smart board;
- announcements and reminders from the administration;
- online reviews about books, videos, and other classroom resources; and
- sections of the faculty handbook, such as emergency procedures and field trip regulations.

We can also ask students to read different types of informational text during daily instructional routines, including weather almanacs, "student of the day" biography, current events newsbytes, position statements on classroom issues, advice columns, and tips for studying or test-taking. Students can become student leaders and use procedural texts to complete daily responsibilities, such as taking attendance, orienting new students, leading circle time activities, and peer editing.

Including Different Types of Informational Texts in Classroom Discussions

Text discussions can increase students' abilities to comprehend text, think critically and metacognitively, reason and argue, and locate information, as well as improve students' reading attitudes and motivation (e.g., Murphy, Wilkinson, Soter, & Hennessey, 2009). Many existing models for talking about text include informational texts (e.g., Beck, et al., 1996; Klingner, Vaughn, & Schumm, 1998; Rosenshine & Meister, 1994). When we implement these models, using different types of informational texts may offer elementary students the opportunity to become familiar with and practice comprehending multiple types of informational text. Resources such as Klingner, Vaughn, Dimino, Schumm, and Bryant (2001); Goldenberg (1992);

Guthrie and McCann (1996); McKeown, Beck, and Worthy (1993); and Oczkus (2010) contain useful advice for using text discussions in the classroom.

Asking Students to Read Different Types of Informational Texts for Real Purposes

We read informational texts to accomplish our own goals. In the example above, I read informational texts to carry out household chores, learn new ideas, take care of my family, and use money wisely. If students use informational texts outside of school, they will also read them to achieve their own goals. Encouraging students to read different types of informational texts to achieve the same goals for which they would use them outside of school, such as to solve problems, develop expertise, and learn skills, gives students a need to learn and increases the chances that they will use multiple types of informational text on their own and for their own purposes. (See Duke, Caughlan, Juzwik, & Martin, in press, for ways that other K-8 teachers have used out-of-school activities in their classrooms.)

Encouraging Metatextuality in the Elementary Classroom

Discussing informational texts and readers' experiences can help students to recognize the differences among informational texts. Comparing and contrasting different types of informational texts can help students to see that informational texts may have various purposes and characteristics. Students can also begin to learn the typical purposes and characteristics of each type of informational text. Moreover, students can start to see how authors sometimes use their informational text knowledge to create hybrid texts that enable them to achieve different and multiple goals. In addition, encouraging students to think about the similarities and differences in their thinking when they read different types of informational text can also help students to recognize that comprehending informational texts does not always mean using just one predetermined set of processes before, during, and after reading.

Challenging Students with Different Types of Informational Texts

Providing elementary students with opportunities to read challenging informational texts helps them to gain experience using comprehension processes. Readers *strategically* approach the task of comprehending texts only when the texts are difficult for them. In Michael Pressley and Peter Afflerbach's (1995) words: "conscious processing besides decoding is not necessary in order for readers to understand easy texts. Active and strategic efforts at meaning construction only occur in reaction to more challenging texts" (p. 14). Elementary students are unlikely to find the same texts to be equally challenging, and they may also find some genres more challenging than others. Including different types of informational texts at varying levels of difficulty may offer more students the opportunity to practice using processes as they read informational text.

Teaching Comprehension Processes for Different Types of Informational Texts

Elementary students may differ in their use of processes. When they are struggling to comprehend biography, persuasive texts, and procedural texts, it may be helpful to assess whether the students already use the same comprehension processes that Corey, Eric, and the other on-grade-level elementary readers reported using and teach the ten processes as needed. For biography and persuasive texts, this means assessing and teaching inferencing, evaluating content, interpreting, asking questions, and summarizing. For procedural texts, this means also focusing on evaluating mindset, monitoring problems, monitoring processing, repeating text, and self-direction.

Learning How Students Read Different Types of Informational Texts

Elementary students use a variety of processes to comprehend informational texts. Learning about below-, on-, and above-grade level readers' reported use of processes may

provide additional ideas for helping elementary readers to comprehend different types of informational text. Think-alouds like the ones that were collected and analyzed in my study can yield valuable insights. To get started, resources such as Hilden and Pressley (2011), Kucan (2007), Pressley and Hilden (2004), Serafini (2010), and Wilhelm (2008) may be useful.

Concluding Thoughts

Corey, Eric, and the other U.S. elementary students in my study shared their thinking as they read biography, persuasive text, and procedural text. Elementary on-grade-level readers appear to use multiple approaches to comprehend different types of informational text. The results of my study suggest that U.S. informational text comprehension instruction and assessment needs to recognize that students' use of processes may differ by informational genre. Focusing on multiple types of informational text in our elementary classrooms can increase the alignment between on-grade-level readers' approaches to informational text comprehension and elementary instruction and assessment.

Figure 1

Reading Comprehension Factors

Factor	Role	Some Examples
Reader	Comprehension depends upon readers' knowledge, skills, previous experiences, and attitudes.	Readers' beliefs, goals, problem-solving skills, world knowledge, and vocabularies
Text	Comprehend also depends upon the elements of the written text. Built-in scaffolds may support comprehension, and mismatches between text elements and readers can constrain it.	Writers' choices about ideas, language, mechanics, organization, and voice
Activity and Context	In addition, comprehension depends upon the task that readers are given and the situation in which the reading occurs. Tasks and situations offer various supports and obstacles.	Studying for a test at school, finding an answer to a question at home, learning about staying healthy at a doctor's office, selecting a meal at a crowded restaurant, shopping for an item online

Figure 2

Sample Texts: Biography, Persuasive Texts, and Procedural Texts

Grade	Sample Texts
Biography	
2nd grade	Davis, L. (2006). *Susan B Anthony*. Mankato, MN: Capstone. Polette, N. (2003). *Pocahontas*. New York, NY: Children's Press. Stauffacher, S. (2011). *Nothing but trouble: The story of Althea Gibson*. Langford, Canada: Dragonfly Books.
3rd grade	Prokos, A. (2005). *They worked together*. Parsippany, NJ: Celebration Press. Krull, K. (2011). *Jim Henson: The guy who played with puppets*. New York, NY: Random House Books for Young Readers. Kulling, M. (2011). *In the bag!: Margaret Knight wraps it up* Toronto, Canada: Tundra Books. Lysecki, M., & Murray, J. (2005). *They changed the world*. Parsippany, NJ: Celebration Press.
4th grade	Mortensen, L. (2010). *Come see the Earth turn*. Berkeley, CA: Tricycle Press. Aliki. (1988). *A weed is a flower: The life of George Washington Carver*. New York, NY: Aladdin. Blanche, L., & Daniel, C. (2005). *Olympic champions*. Parsippany, NJ: Celebration Press. Hammontree, M. (1986). *Albert Einstein: Young thinker*. New York, NY: Aladdin. Shea, P. D. (2009). *Noah Webster: Weaver of words*. Honesdale, PA: Boyds Mills Press.
5th grade	Geyer, F. (2007). *Mao Zedong: The rebel who led a revolution*. Des Moines, IA: National Geographic Children's Books. Krull, K. (2006). *Isaac Newton*. New York, NY: Viking Juvenile. Riddolis, T. (2010). *Sally Ride: The first American woman in space*. New York, NY: Crabtree. Wagner, M. (2005). *Going solo*. Parsippany, NJ: Celebration Press.
Persuasive Text	
2nd grade	Green, J. (2002). *Why should I recycle?* Hauppauge, NY: Barron's. Lollis, S., & Hogan, J. W. (2003). *Should we have pets?: A persuasive text*. New York, NY: Mondo Publishing. Parr, T. (2001). *It's okay to be different*. New York, NY: Little, Brown and Company.
3rd grade	Thomas, P. (2006). *My manners matter*. Hauppauge, NY: Barron's. Royston, A. (2008). *Global warming*. Portsmouth, NH: Heinemann Library.

Figure 2 (cont'd)

Grade	Sample Texts
	Morgan, S. (2009). *Ozone hole*. Mankato, MN: Sea to Sea Publications.
	Morgan, S. (2007). *Acid Rain*. Danbury, CT: Franklin Watts.
4th grade	Silver, D. M. (1993). *Why save the rain forest?* Herndon, VA: Silver Burdett. Boyer, T. B. (2005). *A bright idea: Conserving energy*. New York, NY: Raintree Paperbacks.
	Cleveland, M. (2005). *Try it!* Parsippany, NJ: Celebration Press. Fridell, R. (2008). *Protecting Earth's water supply*. Minneapolis, MN: Lerner Classroom.
5th grade	Rochford, D. (2004). *Rights for Animals?* Danbury, CT: Franklin Watts. Blackaby, S. (2005). *Turn it down!* Parsippany, NJ: Celebration Press. Gore, A. (2007). *An inconvenient truth: The crisis of global warming*. New York, NY: Viking Juvenile.
	Parker, J. (2008). *The disappearing forests*. New York, NY: Weigl Publishers. Thornhill, J. (2007). *This is my planet: The kids' guide to global warming*. Toronto, Canada: Maple Tree Press.
Procedural Text	
2nd grade	Fleming, S. (2000). *Do the lolly trick.* Cambridge, UK: Cambridge University Press.
	Katzen, M. (2005). *Salad people and more real recipes: A new cookbook for preschoolers and up.* New York, NY: Tricycle Press. Morton, T. B. (2005). *Let's play games around the world*. Parsippany, NJ: Celebration Press. Siamon, S., Siamon, J., & Benjamin, C. (2005). *Fun with shadows*. Parsippany, NJ: Celebration Press.
3rd grade	Haab, S. (2009). *Clay so cute!: 21 polymer clay projects for cool charms, itty-bitty animals, and tiny treasures.* New York, NY: Potter Craft.
	Hodge, D. (1996). *Simple machines*. Toronto, Canada: Kids Can Press. Kekewich, D. (2005). *The mystery of magnets*. Parsippany, NJ: Celebration Press. Pinnington, A. (2004). *Rainy day activity book*. New York, NY: Priddybooks.
4th grade	Carney, M. (2005). *Bird-watching*. Parsippany, NJ: Celebration Press. Cobb, V. (1994). *Science experiments you can eat*. New York, NY: HarperCollins.
	Whiter, B. (2001). *Balloon animals*. New York, NY: Mud Puddle Books. VanCleave, J. P. (1992). *Janice VanCleave's 200 Gooey, Slippery, Slimy, Weird and Fun Experiments*. Hoboken, NJ: Wiley, John & Sons.

Figure 2 (cont'd)

Grade	Sample Texts
5th grade	Beard, D. C. (2009). *The fair weather and rainy day handy book*. Mineola, NY: Dover Publications. Monaghan, K. (2007). *Organic crafts: 75 Earth-friendly art activities*. Chicago, IL: Chicago Review Press Terzian, A. M. (1993). *The Kids' multicultural art book: Art & craft experiences from around the world*. Nashville, TN: Williamson Publishing. Wignell, S. (2005). *First-aid handbook*. Parsippany, NJ: Celebration Press.

Figure 3

Processes that Students Commonly Reported Using with Biography and Persuasive Texts

Strategies	Examples of On-Grade-Level Readers' Reports
Inferencing	"I think his crew died only because they didn't have enough food."
	"I'm thinking if all the fish like swim away we wouldn't have much food."
	"You still couldn't drink that [water]. It'd have to go through a whole process."
	"We have to make the water clear so no one gets sick."
	"I am feeling that he's having fun when he goes to space."
Evaluating Content	"2,000 hours in space seems a long time."
	"I feel sad for his astronaut friends that he's dead."
	"I think it's pretty cool that we can re-use it over and over again."
	"I'm feeling happy that his dream did come true."
	"I'm feeling bad for the people that get lots of floods, and I feel bad for the people who actually have their houses on water like in this picture."
Interpreting	"I'm thinking that those people are trying to collect the fresh water."
	"Michael—is this a picture of him?"
	"I'm thinking that umm that's where the control room is."
	"I'm thinking that the fertilizer can get into the water, and the fish can eat it and then die."
	"He's carrying something on his head."
Questioning	"How could global warming make the oceans warmer?"
	"I'm wondering if he died."
	"Why do people pollute water?"
	"I'm wondering what they're going to talk about with Michael Anderson."
	"I wonder why these do that?"
Summarizing	"It's about a little boy who wants to become an astronaut."
	"They're telling you umm what people need and what animals need for water."
	"They went out to space."
	"We don't have a lot of fresh water in the world."
	"He wanted his dream to come true and his parents are encouraging him to do stuff."

Figure 4

Processes that Students Used More Often With Procedural Texts

Strategies	Examples of On-Grade-Level Readers' Reports
Self-Direction	"Get the scissors in there."
	"[Put it] on the A."
	"Cut it right there."
	"Use the pencil."
	"Let's see here."
Repeating Text	"It says the mirror should be facing down and the bottom mirror facing up."
	"On this side of the carton cut the slits as before."
	"Make a hole in the back of the carton."
	"Cut the lines to make two slots."
	"… a large square at the top of the carton."
Monitoring Problems	"That's like the worst triangle that I ever…"
	"I can't get it because I can't hold it still."
	"No, that's not right… pest…"
	"No, skipped a line."
	"I'm thinking that I keep messing up on words that I already know."
Monitoring Processing	"We just made something."
	"No it's a piece of... I forgot… but yeah…"
	"I'm thinking that it's going to be easy to do that."
	"I'm feeling excited."
	"I read a lot of pages and words."
Evaluating Mindset	"I'm thinking I hope this is a good book."
	"I think this is going to be really interesting."
	"I'm thinking that it's going to take a lot of work to do it."
	"I'm feeling like this is going to be a good project."
	"I'm feeling kind of tired, because I didn't sleep that good last night."

References

References

Baumann, J. F., & Bergeron, B. S. (1993). Story map instruction using children's literature: Effects on first graders' comprehension of central narrative elements. Journal *of Reading Behavior*, 25, 407-437. doi: 10.1080/10862969309547828

Beck, I. L., McKeown, M. G., Sandora, C., Kucan, L., & Worthy, J. (1996). Questioning the author: A yearlong classroom implementation to engage students with text. *The Elementary School Journal, 96*, 385-414. doi: 10.1086/461835

Buss, K., & Karnowski, L. (2002). *Reading and writing nonfiction genres*. Newark, DE: International Reading Association.

Cullinan, B. E., & Galda, L. (1998). *Literature and the child* (4th ed.). New York, NY: Harcourt Brace.

Davis, M. H., & Tonks, S. (2004). Diverse texts and technology for reading. In J. T. Guthrie, A. Wigfield & K. C. Perencevich (Eds.), *Motivating reading comprehension: Concept-Oriented Reading Instruction* (pp. 143-171). Mahwah, NJ: Lawrence Earlbaum.

Dean, A., & Small, R. (1997). Sharing the responses of readers: An interdisciplinary pumpkin unit in the first grade. In N. J. Karolides (Ed.), *Reader response in elementary classrooms: Quest and discovery*. Mahwah, NJ: Lawrence Erlbaum.

Dubrow, H. (1982). *Genre*. New York: Methuen.

Duke, N. K., Caughlan, S., Juzwik, M. M., & Martin, N. M. (in press). *Reading and writing genre with purpose in K - 8 classrooms*. Portsmouth, NH: Heinemann.

Duke, N. K., & Roberts, K. M. (2010). The genre-specific nature of reading comprehension. In D. Wyse, R. Andrews & J. Hoffman (Eds.), *The Routledge international handbook of English language and literacy teaching* (pp. 74-86). London: Routledge.

Duthie, C. (1994). Nonfiction: A genre study for the primary classroom. *Language Arts, 71*, 588-597. Retrieved from http://www.ncte.org/journals/la

Goldenberg, C. (1992). Instructional Conversations: Promoting comprehension through discussion. *The Reading Teacher, 46*, 316-326. Retrieved from http://www.reading.org/General/Publications/Journals/RT.aspx

Guthrie, J. T., & McCann, A. D. (1996). Idea circles: Peer collaborations for conceptual learning. In L. B. Gambrell & J. F. Almasi (Eds.), *Lively discussions! Fostering engaged reading* (pp. 87-105). Newark, DE: International Reading Association.

Johns, A. M. (Ed.). (2002). *Genre in the classroom: Multiple perspectives*. Mahwah, NJ: Lawrence Erlbaum.

Herman, G. B. (1978). "Footprints in the sands of time": Biography for children. *Children's Literature in Education, 9*, 85-94. doi: 10.1007/BF01139703

Hilden, K., & Pressley, M. (2011). Verbal protocols of reading. In N. K. Duke & M. H. Mallette (Eds.), *Literacy research methodologies* (2nd ed., pp. 427-481). New York: Guilford.

Kafka, T. (2005). *Charting your course*. Parsippany, NJ: Celebration Press.

Klingner, J. K., Vaughn, S., & Schumm, J. S. (1998). Collaborative Strategic Reading during social studies in heterogeneous fourth-grade classrooms. *The Elementary School Journal, 99*, 3-22. doi: 10.1086/461914

Klingner, J. K., Vaughn, S., Dimino, J., Schumm, J., & Bryant, D. (2001). *From clunk to click: Collaborative Strategic Reading*. Longmont, CO: Sopris West.

Kucan, L. (2007). Insights from teachers who analyzed transcripts of their own classroom discussions. *The Reading Teacher, 61*, 228-236. doi: 10.1598/RT.61.3.3

Kucan, L., & Beck, I. L. (1996). Four fourth graders thinking aloud: An investigation of genre effects. *Journal of Literacy Research, 28*, 259-287. doi: 10.1080/10862969609547921

Martin, N. M. (2011). *Exploring elementary students' informational comprehension processes (Unpublished doctoral dissertation).* Michigan State University, East Lansing, MI.

McKeown, M. G., Beck, I. L., & Worthy, M. J. (1993). Grappling with text ideas: Questioning the author. *The Reading Teacher, 46*, 560-586. Retrieved from http://www.reading.org/General/Publications/Journals/RT.aspx

Michigan Department of Education. (2005). K-8 GLCE English Language Arts looking across the grades document. Retrieved from http://www.michigan.gov/documents/ELA_Whole_Folder_144868_7.pdf

Mooney, M. E. (2001). *Text forms and features: A resource for intentional teaching*. Katonah, NY: Richard C. Owen Publishers.

Moss, B. (2008). The information text gap: The mismatch between non-narrative text types in basal readers and 2009 NAEP recommended guidelines. *Journal of Literacy Research, 40*, 201-219. doi: 10.1080/10862960802411927

Murphy, P. K., Wilkinson, I. A. G., Soter, A. O., & Hennessey, M. N. (2009). Examining the effects of classroom discussion on students' comprehension of text: A meta-analysis. *Journal of Educational Psychology, 101*, 740-764. doi: 10.1037/a0015576

National Assessment Governing Board. (2008). *Reading framework for the 2009 National Assessment of Educational Progress.* Retrieved from http://www.nagb.org/publications/frameworks/reading09.pdf

National Governors Association & Council of Chief State School Officers. (2010). *Common core state standards for English Language Arts & literacy in history/social studies, science, and technical subjects*. Retrieved from http://www.corestandards.org/the-standards/english-language-arts-standards

Olson, G. M., Mack, R. L., & Duffy, S. A. (1981). Cognitive aspects of genre. *Poetics, 10*, 283-315. Retrieved from http://www.elsevier.com/wps/find/journaldescription.cws_home/505592/description#description

Oczkus, L. D. (2010). *Reciprocal Teaching at work: Powerful strategies and lessons for improving reading comprehension* (2nd ed.). Newark, DE: International Reading Association.

Paré, A., & Smart, G. (1994). Observing genres in action: Towards a research methodology. In A. Freedman & P. Medway (Eds.), *Genre and the new rhetoric*. London: Taylor and Francis.

Pressley, M., & Afflerbach, P. (1995). *Verbal protocols of reading: The nature of constructively responsive reading*. Hillsdale, NJ: Erlbaum.

Pressley, M., & Hilden, K. (2004). Verbal protocols of reading. In N. K. Duke & M. H. Mallette (Eds.), *Literacy research methodologies* (pp. 308-321). New York: Guilford.

Purcell-Gates, V., Duke, N., & Martineau, J. A. (2007). Learning to read and write genre-specific text: Roles of authentic experience and explicit teaching. *Reading Research Quarterly, 42*, 8-45. doi: 10.1598/RRQ.42.1.1

RAND Reading Study Group. (2002). *Reading for understanding: Toward an R&D program in reading comprehension*. Santa Monica, CA: Rand Education. Retrieved from http://www.rand.org/multi/achievementforall/reading/readreport.html

Rosenshine, B., & Meister, C. (1994). Reciprocal teaching: A review of the research. *Review of Educational Research, 64*, 479-530. doi: 10.3102/00346543064004479

Serafini, F. (2010). *Classroom reading assessments: More efficient ways to view and evaluate your readers*. Portsmouth, NH: Heinemann.

Smith, M. C. (2000). The real-world reading practices of adults. *Journal of Literacy Research, 32*, 25-52. doi: 10.1080/10862960009548063

Stewart, S. (2005). *Save our Earth*. Parsippany, NJ: Celebration Press.

Toulmin, S. (1958). *The uses of argument*. Cambridge, England: Cambridge University Press.

Venezky, R. L. (2000). The origins of the present-day chasm between adult literacy needs and school literacy instruction. *Scientific Studies of Reading, 4*, 19-39. doi: 10.1207/S1532799XSSR0401_3

White, S., Chen, J., & Forsyth, B. (2010). Reading-related literacy activities of American adults: Time spent, task types, and cognitive skills used. *Journal of Literacy Research, 42*, 276-307. doi: 10.1080/1086296X.2010.503552

Wilhelm, J. (2008). *Improving comprehension with think-aloud strategies: Modeling what good readers do*. New York: Scholastic.

Williams, J. P., Hall, K. M., Lauer, K. D., Stafford, B., DeSisto, L. A., & deCani, J. S. (2005). Expository text comprehension in the primary grade classroom. *Journal of Educational Psychology, 97*, 538-550. doi: 10.1037/0022-0663.97.4.538

Appendix

Appendix

Dissertation Study Coding Manual

This appendix contains the coding manual used in the dissertation study. The first two sections were used to code students' responses to questions about their background knowledge. The third section was used to code students' verbal protocols. Each section contains codes, code descriptions, and examples.

1: Students' Responses to Background Questions: Microcoding

Special Notes:
For some questions, the follow-up questions are not asked when a participant responds "no" or "I don't know." In these cases, the follow-up questions should be coded as "Not Applicable." If a student's response contains multiple ideas, the response can be coded with multiple codes. Please use the code "98" for missing data.

Question 1

Question	*Code*	*Description*	*Examples*
1: Have any of your teachers ever asked you to think aloud?	**88**	**Uninterpretable**	• [unintelligible] (2030303)
	2	**Yes**	• I think my teacher did last year (1010201). • umm-hmm (1010202). • uh sometimes (3040306). • I have read one before (1010301).
	3	**No**	• not really (4060208). • umm not yet but I'm hoping so because I just love thinking and I always talk to myself (1020502). • nope (2030304). • nah (4060408).
	4	**I don't know**	• I don't know (1010201).
	5	**No response**	• umm… (5070309) *Note: No other response followed the 'umm.'*
	6	**Indicates previous experience other**	• none of my teachers but my parents have they wanna want me to express my feelings (5070209).

Question 1			
Question	***Code***	***Description***	***Examples***
		than thinking aloud during reading	• no but my teacher asks me to write down what we're thinking when we read a book (5070510).
1a: When?	**1**	**Not applicable**	
	2	**Reading or writing block, unspecified interval or day**	• I think at the U-table (1010201). • usually when we're… uh, in a in a reading group which we were before just before lunch (1010202). • like whenever we're writing like on a chalkboard, book stories… umm…(3040306). • recently when I had my last reading session with my teacher for reading groups. and she asked me to think aloud. and once in third grade when I was doing a reading thing with another teacher. (5070409; coded twice as 2)
	3	**Content area class, unspecified interval or day**	• like at Math and Reading sometimes (3050405, double-coded with 2) • umm when like in Math I guess yes (4070410)
	6	**Class unspecified, occurred in the past, not recurring**	• a long time ago (3040205). • umm last year (3040305). • when like… when I been in grades like last year (4060507). • umm third or fourth grade (5070509).
	8	**Class unspecified, recurring**	• when I'm feeling down about something (5070209). • before we leave we always have to tell our teacher what we do (3040307).
	10	**Class unspecified, occurred within the current school year, not recurring**	• umm last week (4060308). • umm I think it was last week (1020401).

Question 1			
Question	***Code***	***Description***	***Examples***
1b: How often?	**1**	**Not applicable**	
	2	**No indication of frequency, not specific, not recurring**	• not so much (1010202). • not that often though (3050405). • not that often because we didn't read that much in our in our book so… (4060507)
	3	**Fewer than 10 times**	• well… I've done it we did it once like that we were supposed to (1020401). • umm… maybe two times (1020402).
	5	**No response**	• (silence, shrug) (2030204).
	6	**Recurring infrequently**	• not sure, like three or four times every year (3040306). • umm at least once or twice a year (5070409). • like a couple of days and a couple of months (5070509).
	7	**Indication of frequency, not specific**	• mostly every time I'm feeling down (5070209). • umm… quite a few times (3040305)
	10	**Recurring frequently on a specified cycle**	• maybe once a week, or … I think just this year (1010202). • kind of a lot… basically everyday (3050406). • like once in two weeks, every other week (4070410). • umm maybe last year… maybe one a day (1020402).

Question 2			
Question	***Code***	***Description***	***Examples***
2: Have you	**2**	**Yes**	• I have read that (4060208). • I have at my house I think (1010302).

Question 2			
Question	***Code***	***Description***	***Examples***
ever read or learned about conservation?	**3**	**No**	• Umm one book I think (1020401). • no (1020402). • hmm-huh (1010201). • never in my life (3040206). • I don't think so (1010302).
	4	**I don't know**	• I don't know what that is (1010201). • I really don't know what it really means so… (1010301).
	5	**No response**	• umm… (5070309) [Note: This code is used for "umm…" when it is the participant's only response (without any additional comments.]
2a: Tell me about conservation. / What do you know about conservation?	**1**	**Not applicable**	
	2	**Provides an example or fact related to conservation**	• they're trying to regrow some trees and umm help the trees that are skinny to grow (1020401). • if you don't conserve the environment then umm… sometimes if you cut down trees and don't replant then that's how some forests got wiped out (1020401).
	4	**I don't know**	• I don't know much about it (1010202). • I forgot a lot about it now (1010202). • I don't know what that is (4060208). • ah I forgot (1010302). • I can't remember because I was really young, like two or three (2030304).

Question 3			
Question	***Code***	***Description***	***Examples***
3: Have you	**2**	**Yes**	• yes (5070410).

Question 3			
Question	***Code***	***Description***	***Examples***
ever read or learned about periscopes?	**3**	**No**	• uh like what pirates use?... uh yeah (4060208). • (shakes head)(2030304) • periscopes… umm... I think not (3040306). • umm I don't think so… like umm aren't they the ones when you're observing space? (1020401).
	4	**I don't know**	• I don't know (1010201). • … not that much (4070410).
	6	**Indicates previous experience with or knowledge of periscopes (not related to reading or learning)**	• I saw a couple (3040206). • well I just know what they are (5070310) • no but I've heard of them once. I've actually never but I've never really read them. (5070409) *NOTE: Do not double-code 6 with any other code.*
3a: Tell me about periscopes. / What do you know about periscopes?	**1**	**Not applicable**	
	4	**Claims to know nothing**	• … not that much (5070410)
	2	**Describes purpose as seeing**	*NOTE: Because some periscopes include magnifiers to allow people to see more distant objects, students' comments about seeing things far away should be coded as a 2 (rather than an 11) if they do not provide any other evidence that they are talking about telescopes.* • you can see far (3040206). • they use them to to see far (4060208). • you can look through things that are very interesting (4060408). • and you can look at things that are very far away (4060408).
	8	**Recounts physical properties of periscopes**	• that they're black with like glasses (4060208). • are they like a like a tube thing? (1010301)

Question 3			
Question	***Code***	***Description***	***Examples***
	7	**Recounts own or others' experiences with periscope**	• and if u look at the other end it goes, umm it shrinks shorter and, if you look at the other end it's bigger (3040206). • when my sister did she says she barely knows which way to go which one way to put her eye in and which one not to (4060408). • I have one at home (3040206). • I like to go that that and I act like it's far away so I go like this [unintelligible] and the ones that you put on the ground. I have I have this thing and I was over at my friend's house. (5070310, coded twice as 7) • and you get to look through them for far things; some people use them to look up in the sky and down low (4060208, double-coded with 2).
	10	**Offers evaluative opinions about periscopes**	• umm they're weird (4060408). • I've read one or two but umm I like the selections on them… I like… a lot of stuff about them (3050506).
	11	**Provides inaccurate information**	• and sometimes if you look at something very close up and you're far away it looks super close. I mean and you back up too far. and when they're very very tiny and the other side… you you go up to it and you end up bumping into it (4060408). • I think they're like when you look at the stars and you need to see very close. and like some people like to name stars (4070409).

Question 4			
Question	***Code***	***Description***	***Examples***
4: Have you ever read or learned about	**2**	**Yes**	• a little bit (1010301) • kind of. I'm trying to remember back (3040305). • I think so (4060407).
	3	**No**	• no (1010302). • (shakes head)… I don't know who he is (3050405).

Question 4			
Question	***Code***	***Description***	***Examples***
Michael Anderson?	**11**	**Provides inaccurate information**	• no. we not learned about that (4060308). • was he… like a famous artist? (3040306).
4a: Tell me about Michael Anderson. / What do you know about Michael Anderson?	**1**	**Not applicable**	
	4	**I don't know**	• umm Michael Anderson… I keep forgetting because every time when I go home I tell my mom and stuff (4060307)
	2	**Provides accurate information about Michael Anderson**	• he's a boy (1010301) • I forgot where umm I umm I was reading this book and uh it told me where he lives. but I forgot it. I think it was somewhere I think in the United States (3040305).
	11	**Provides inaccurate information**	• he's a singer (1010301) • umm that he, umm… I think he is an actress (3040305).

Question 5			
Question	***Code***	***Description***	***Examples***
5: Have you ever read any other books that are the	**2**	**Yes**	• um-hmm (1010202). • uh, yeah, saw one just like it (4060208). • umm…. a few books like this (5070209).
	3	**No**	• mmm… I don't really, well I think I probably did (1020501) • not really (1010201). • not that I can think of (1010202).

Question 5			
Question	***Code***	***Description***	***Examples***
same kind of book as this one?			• umm… no I never read this kind of book before (1010301). • I haven't read a book like this but I would try to read more so I know a lot, a lot more about the environment (1020502).
	4	**I don't know**	• umm… I don't know that I read a book like this (5070309).
	6	**Describes a text that could be categorized in the target genre**	• umm well in an another book that I read it had a really important… thing in it. I read a Martin Luther King's birthday book (5070209). • umm… it's a little book like this that has a couple of chapters in it that is about the oil spill (5070509).
	7	**Describes genre characteristics (appropriate to the target genre)**	• and it had a really special fact in it. and it was actually very factual. I read this in first grade. it had lots of facts about him (5070209). • and it was like you were part of him being born, him growing up, him changing things like black people having to sit in the back of the bus (5070209).
	8	**Identifies/describes text not representative of the genre**	• I've read a book like it was not with real people in it, it was just like a cartoon book… there was this dog that was going into space. and his friend the cat was coming with him. and they tried to come back from the moon and their shuttle, shuttle broke on the way back. but they like, they had like parachutes, and they went down to Earth. (2030304)
5a: When?	**1**	**Not applicable**	
	4	**I don't know**	• umm, I do not remember (1020502)
	2	**Not recurring, during reading or content area class**	• we were in centers, and my teacher, umm we did something called Reading Practice. we we all went into a group and umm we umm we read a book about space, about outer space (4060508). • in science and, like I did this report on animals in third grade (3050505, double coded with 6). • umm umm a couple of weeks ago umm it had peratoscopes. I was, like we had to do a science project (1020502).

Question 5			
Question	***Code***	***Description***	***Examples***
	6	**Not recurring, unspecified class, occurred during previous years**	• ah I've only read one like once I think (2030504). • umm… maybe fourth, third grade. or maybe somebody read it to me (1020501, double coded with 7). • I have read books like this in other years too (5070510) • umm like… the end of the first semester in first grade (5070209). • first grade (3040206). • umm last year, like two books in Kindergarten and 1 book last year (5070209). • it was when I was in third grade when we were reading about how to make birdhouses (4060407).
	9	**Not recurring, at other times of the day (besides the reading block or content area classes)**	• in CAPS sometimes. or sometimes I pick library books like that (1020202). • like in school (5070210). • uh it was uh when we had the book, or I had one of those big books that tell you everything. and I saw the eardrum on it. it teach me about that (4060208).
	10	**Not recurring, unspecified class, occurred within current school year**	• yesterday (1010201). • umm a month ago and… about during the middle of the month… (1020401) • umm… last week (5070410).
	8	**Recurring**	• umm… when… we don't have school (3040206). • umm I read it all the time (2030303) • umm… like… like twice a year (5070510)
	12	**Names or describes a text that could be categorized in the target genre**	• and it was how to make magnet puppets (5070209). • she has recipes that she does. my grandma and my mom are chefs. my mom said if she gives up on her job I have to work there for her when I get grown (4060307). • but I read umm… books that has about spacecrafts because I love science and I always wanted to go up and umm… in outerspace. and I wanted to see who did it already and was part of the history of umm,

Question 5			
Question	***Code***	***Description***	***Examples***
			space (1020502).
5b: How often?	**1**	**Not applicable**	
	4	**I don't know**	• uh I don't know (3040206). • um-hmm… umm I, I read it, a few times, I forgot how much times I read it. I don't know I forgot (1010302, double coded with 2).
	2	**Readings unspecified, neither frequent nor recurring**	• a little bit, kind of (4060208). • not a lot (5070210). • sometimes (4060407).
	3	**Number of readings specified, fewer than 10 readings**	• once (1010201). • I read it a couple of times this summer (1020402). • umm we read it, ok we like read a chapter. and then we read the next chapter and then we kept going to at the end of the book. and then we summarized the book (4060508).
	6	**Recurring infrequently**	• like I find a lot of books like that that are very factual in the library a lot. and I usually go to the library in the summer with my grandma. so usually like once a month… every day a week that we have them (5070209). • umm only like a few times a year (5070209). • like a month or two. sometimes I read it in one month, sometimes I read it in two months (2030303). • mostly like twenty times every year (3040306). • it was like five times every year (3040306).
	7	**Recurring, not specific**	• I do it every time I have to build something. like I had to move my sister into [name of university] so we built a desk and some shelves (2030504). • a whole bunch (4060208). • I read it a lot because I like the book and that's all I can think (1010302).

Question 5			
Question	***Code***	***Description***	***Examples***
	8	**Recurring, for a limited duration**	• umm we used it for about… a month (3050505). • well I read it a lot when I had it. but since it was the library I didn't want to renew it because umm I had already flipped through the whole entire book (1050502, double coded with 9).
	10	**Recurring frequently on a specified cycle**	• umm well for CAPS every day. umm library, once a week [CAPS is twice a week (1010202)]. • like every Tuesday or Wednesday or something (5070310). • two or three times a month maybe (2030304) • umm every… two weeks I'd say (3050506)
	11	**Number of readings specified, ten or more readings**	• so like maybe ten times (5070309) • every day we did it… for about two or three weeks (1020401)
5c: What do you know about books that are the same kind of book as this one?	**88**	**Uninterpretable**	• that they are the same type of book like fiction and stuff like that… (5070210). • umm they're about… they're about like the same thing and they have the important things in them (2030404). • that sometimes they can be really important. and… umm sometimes they can be silly, sad. it doesn't really matter what the book is about. they're special in all kinds of ways. that's it (1010202). • I know that they are important (1010202).
	4	**I don't know**	• not really much (2030203). • I forgot (2030204). • I don't know, I didn't read any (3040206). • nothing really (3050405).
	2	**Describes the books' contents**	• they umm talk about famous people and they're good people (1010201). • and it was like you were part of him being born, him growing up, him changing things like black people having to sit in the back of the bus

Question 5			
Question	***Code***	***Description***	***Examples***
			(5070209).
			• they always talk about like not to pollute the Earth (2030303).
	3	**Describes the books' features**	• that they have a dictionary and we real photos (3040205). (coded twice for 3).
			• it had a really special fact in it. and it was actually very factual. I read this in first grade. it had lots of facts about him (5070209).
			• they tell like real things and about stuff (1010201).
			• they usually inform you it's about something (4060508).
	6	**Describes the books' forms**	• that it's a small book but it has lots of words (5070210).
			• that they help you to make something , like an activity for you to do (2030503, double coded with 8).
	8	**Describes the books' purposes**	• I know that they are important and they kind of tell you to help us… make it better. and saving stuff (1010202). (double-coded with 9)
			• they tell you how to make stuff . it's kind of like science. but they tell you how to make stuff and that's kind of what science does (1010201).
			• they tell you a ton of things that you need to know (3040306).
			• it gives you a really lot of information about the thing or the person (5070510).
	10	**Describes the books' style (including tone and language)**	• and… umm sometimes they can be silly, sad (1010201).
			• and if it just a theory like umm maybe because they wouldn't know what he was doing when the thing was crashing… they might have said our theory is this (1020401).
	12	**Talks about the author's role**	• I know that whoever made it took a lot of work on it (1010201).
			• and had to try it to really show people how to do it (1010201).
	7	**Describes readers' responses to the books**	• that most people are thinking or… feeling something when they're reading those books (5070209).
			• and it can be like fun to make them (2030303).
			• just I like them (3050405).
			• and some of the stuff can be useful (3050506).

Question 5			
Question	***Code***	***Description***	***Examples***
			• you end up making it (4060507).
	13	**Names or provides example of the focal genre/text category**	• … I [unintelligible] like I have a book about cutting (3040206). • Biographies (1010302). • that they're nonfiction (3040306).
	15	**Recites facts related to focal book's topic**	• and… on the moon there's still footprints because there is no wind… and they have to wear special like outfits so they like won't die… that there are nine planets and Jupiter is the biggest (2030303, coded 4 times). • because it's very dangerous, because you never know… you might run out of fuel and be stuck in space… or your ship might fall apart… or somebody could just die… because they uh been up there too long on the moon and there's just not enough air (5070409).
	11	**Inaccurate information (about the focal genre)**	• a book about my friends and what are the same in the classroom (5070210).

2: Students' Responses to Background Questions: Macrocoding

Question 1						
Question	***Code***	***Description***	***Rule***			***Knowledge category rules***
			1	**1a**	**1b**	
1: Have any of your teachers	**1**	**No Knowledge**	3, 4, 5	1	1, 5	*two or more 1s*
	2	**Recognition of Concept**	--	6	2, 3 (plus any other code)	*one 1, one 2, and 1 3* *two 2s and 1 or 9*
	3	**Some**	2 (plus any	2 (plus any	6	*three 3s*

Question 1						
Question	***Code***	***Description***	***Rule***			***Knowledge category rules***
			1	**1a**	**1b**	
ever asked you to think aloud?		**Knowledge**	other code), 6	other code), 3, 10		*two 3s and 1, 2, 4, or 9* *one 3 and 2s and/or 9s* *two 2s and 3, 4, and/or 9*
	4	**Much Knowledge**	--	8	7	*two 4s and 1, 2, 3, and/or 9* *one 4, one 3, and 1, 2, 3, and/or 9*
	5	**Expertise**	--	--	10 (plus any other code)	*one 5 and any other code*
	9	**Uninterpretable**	88, 98, multiple codes from multiple categories (unless otherwise indicated above)			*two 9s*

Question 2					
Question	***Code***	***Description***	***Rule***		***Knowledge category rules***
			2	**2a**	
2: Have you ever read or learned about conserva-tion?	**1**	**No Knowledge**	3 (plus any other code), 4, 5	1,4	*two 1s* *one 1 and 9*
	2	**Recognition of Concept**	--	--	*one 1 and 3 or 4*
	3	**Some Knowledge**	2	one 2	*two 3s* *one 3 and 2 or 9*
	4	**Much Knowledge**	--	two, three, or four 2s	*one 4 and 2, 3, or 9*

Question 2					
Question	***Code***	***Description***	***Rule***		***Knowledge category rules***
			2	**2a**	
	5	**Expertise**	--	more than four 2s	*one 5 and any other code*
	9	**Uninterpretable**	88, multiple codes from multiple categories (unless otherwise indicated above)		*two 9s*

Question 3					
Question	***Code***		***Rule***		***Knowledge category rules***
			3	**3a**	
3: Have you ever read or learned about periscopes ?	**1**	**No Knowledge**	3 (plus any code but 2 or 6), 4	1, 4, 11	*two 1s* *one 1 and 9*
	2	**Recognition of Concept**	--	11 plus any one of another code	*one 2 and 1 or 9*
	3	**Some Knowledge**	2, 6 (plus any other code)	two or fewer: 2, 7, 8, 10 11 plus multiple other codes	*two 3s* *one 3 and 1, 2, or 9*
	4	**Much Knowledge**	--	three or four: 2, 7, 8, 10	*one 4 and 1, 3, or 9*
	5	**Expertise**	--	more than four: 2, 7, 8, 10	*one 5 and 1, 3, or 9*
	9	**Uninterpretable**	multiple codes from multiple categories (unless otherwise indicated above)		*two 9s*

Question 4

Question	*Code*	*Description*	*Rule*		*Knowledge category rules*
			4	**4a**	
4: Have you ever read or learned about Michael Anderson?	**1**	**No Knowledge**	3, 11	1, 4, 11	*two 1s* *one 1 and 9*
	2	**Recognition of Concept**	--	11 plus another code	*two 2s* *one 2 and 9* *one 1 and 2 or 3*
	3	**Some Knowledge**	2	one or two 2s	*two 3s* *one 3 and 2 or 9*
	4	**Much Knowledge**	--	three or four 2s	*one 4 and any other code*
	5	**Expertise**	--	five or more 2s	*one 5 and any other code*
	9	**Uninterpretable**	multiple codes from multiple categories (unless otherwise indicated above)		*two 9s*

Question 5

Question	*Code*	*Description*	*Rule*				*Knowledge category rules*
			5	**5a**	**5b**	**5c**	
5: Have you ever read any other books that are the same kind	**1**	**No Knowledge**	3, 4, 8	1, 4, 5	1, 4	1, 4,11	*four 1s* *three 1s and 9*
	2	**Recognition of Concept**	--	--	2, 3	15 (without any other code) 11 plus any other code	*two 2s and any other code* *one 2 and 1s and/or 9s* *three 1s and 2, 3, or 4* *two 1s and 3s and/or 9s* *one 1 and 2s, 3s and/or 9s*

Question 5							
			Rule				
Question	***Code***	***Description***	**5**	**5a**	**5b**	**5c**	***Knowledge category rules***
of book as this one?	**3**	**Some Knowledge**	one 2, 6	2, 6, 10	6 (plus 1s, 2s, 3s, 4s), 7 (plus 1s, 2s, 3s, 4s)	2 or fewer categories: 2, 3, 6, 7, 8, 10, 12, 13 (plus 15 with any of these categories)	*four 3s* *three 3s and any other code* *two 3s and 1s, 2s, and/or 9s* *two 3s, one 4, and 1, 2, and/or 9* *three 1s and 5* *one 1 and 4s* *one 4, one 3, and 2 9s*
	4	**Much Knowledge**	7 2 or more: 2, 6	8, 9, 12	8 (plus any other code), 10 (plus any other code), 11 (plus any other code)	3 or 4 categories: 2, 3, 6, 7, 8, 10, 12, 13	*four 4s* *three 4s and any other code* *two 4s and any other codes*
	5	**Expertise**	--	--	--	5 or more categories: 2, 3, 6, 7, 8, 10, 12, 13	*one 5 and any other code*
	9	**Uninter-pretable**	88, 98, multiple codes from multiple categories (unless otherwise indicated above)				*three or more 9s*

3: Students' Verbal Protocols

For ease of scoring, this manual has been divided into four sections, according to Pressley and Afflerbach's (1995) discussion of readers' cognitive activities.

- **Learning from Text:** The first section focuses on what readers do before, during, and after reading as they are attempting to make meaning and learn from the text.

- **Monitoring:** The second section focuses on readers' thinking about their reading and comprehension processes.
- **Evaluating:** The third section focuses on readers' opinions and reactions to the text itself (e.g., its physical condition, the trustworthiness of the author, its emotional effect).
- **Other:** The final section contains codes that were not drawn directly from Pressley and Afflerbach (e.g., verbalizations that have no relationship to the text or that cannot be interpreted).

Special Notes:

Each idea unit should be coded with one unique code. Please refer to the actual focal text (its running text *and* graphics) while coding students' verbalizations. Please use the code "98" for missing data.

Learning From Text		
Code	***Description***	***Examples***
DK	*I don't know*	• I don't know. (B1010201) • umm I'm thinking… uh… uh… I'm thinking or feeling… I'm trying to think what I'm thinking because I don't know what I'm thinking. (E2030309)
NO	*Nothing*	• I'm not thinking anything. (B1010202) • I have nothing. (B1010201) • I'm feeling, I'm not thinking right now. (B3040206) • uhh, that he uhh I don't got anything. (B4060208)
Hypothesizing	*Generating a proposition about the text before beginning to read*	• I'm thinking this whole entire book is going to be about astronauts. (B2030303) • I'm thinking that this book is going to tell me what Michael P Anderson is, what his job is to do where, umm and his little outerspace. (B1020502) • I think that this will be kind of about umm how much the water helps us. (E3040306) • umm because just by looking at the pictures and the title it looks like it's going to tell us all about the water. (E5070510)
Predicting	*Making or dis/confirming a guess about what will*	• that they're going to go on out that space and look out the windows and find stuff. (B1010201) • well, he studied science, he's probably going to be an astronaut. (B2030304)

Learning From Text		
Code	***Description***	***Examples***
	happen or come next while reading	• and that… umm he's finally going to be an astronaut. (B1020401) • there's gonna be a giant lakes and rocks are gonna be in it. (E3040206) • umm… that it's gonna look… that it's, that I think it's gonna, when we're done it's gonna look like a birdhouse kind of. (O2030204) • I'm thinking to make this… periscope we have to put two pieces of glass or… mirror, one on the top and one on the bottom. (O2030403) • umm… that we're going to be sticking the mirrors in there. (O3050405)
Activating Previous Knowledge	*Stating what is already known about the topic before beginning to read*	• umm I'm feeling that, well I'm thinking that fresh water is… only in small places but we are very lucky that we get it. (E5070209) • I just remembered what a periscope was. (O2030504) • uh periscopes are sometimes in submarines. (O2030504)
Interpreting	*Drawing conclusions about the meaning of the idea that is explicitly stated in the text or the included graphics (without going beyond what is there)*	• I'm thinking that that it's about 500 feet. (B2030203) • Michael—is this a picture of him? (B2030204) • and those guys look really friendly. (B5070510) • I'm thinking that they're pushing it down to get water… in the bucket… so they can drink it. (E4060208) • I'm thinking if we wouldn't have water we would probably die. (E2030404) • umm so far I'm thinking that umm a lot of things you don't think about umm we use water for. like umm… even for cooking. (E1020401) • umm I'm thinking that the fertilizer can get into the water. and the fish can eat it and then die. (E1020401) • I'm thinking about fresh water. (E3040305) • there's three children over here. (O2030204) • umm… that you gotta do the mirrors and face them each other. (O4060208) • the big square is here. (O4060208) • and also they've got it much taller and longer than the one that we made. (O1010201) • umm I'm thinking that we got to poke a hole with the pencil and make it so that it's level with the bottom mirror… (O1010202)
Inferencing	*Drawing conclusions about information not*	• umm I'm feeling that he's a gonna kinda be the chief of astronauts now. (B1010202 – *after reading that Michael had been put in charge of the science work*)

Learning From Text		
Code	***Description***	***Examples***
	explicitly stated in the text or shown in the included graphics (e.g., omitted information, unknown words, characters' motivations)	• I am… feeling that he's having fun… when he goes to space. (B5070210) • I'm thinking that he's the only one living right now and he's trying to fix it. (B1010301) • I'm thinking if if I lived there it would be loud. you would hear a lot of airplanes in the morning. (B2030304) • and I'm actually thinking that there's a 99% chance that they can die because of that. (E5070209) • well if like the farmers like give the food for stores then we wouldn't have any of those vegetables any more because of all of the pollution. (E1020502) • actually that's gonna need, that you'll need to do some tracing (O1010202) • I'm thinking that the mirrors, if you didn't have the mirrors you couldn't see. (O2030304) • and umm… since we were talking about author's purposes for a long time… I'm thinking that this author made, wrote this because he's trying to… umm trying to… explain something to you. (O5070510)
Integrating	*Referring to an idea previously mentioned in the text (and included graphics), or describing how the current idea contributes to the macrostructure of the text*	• so far I can tell that Michael he probably died in the coming down umm because it says he died in 2003. and this says on 2003 the umm space ship crashed. it blew up. (B1020401 – *after reading the caption on the previous page which said he died in 2003 and the paragraph which said that the space ship exploded in 2003*). • if we keep polluting then all the fish will die. then all the plants will die. (E2030403) • I'm feeling about like how the mirrors is onto the light (O4060307, *after cutting the slots*).
Relating	*Making a connection between the text (and included graphics) to something in the readers' life, in another text, or in the*	• and 2003 was the year I was born. (B5070509) • it's kind of like the uh Wizard of Oz when umm the lion, he had courage (B5070309) • … my mom told me that there's this little tunnel and umm ah New York that leads to a different city (E4060408) • it reminds me of the oil spill… the fish kinda had to move away from there. (E3050505)

Learning From Text		
Code	***Description***	***Examples***
	world.	• I'm thinking when I was in first grade I was in this school and my teacher was [teacher's name] and we was doing a project and, uh she made us drink salt water and regular water to see how it felt and how it tasted. (E4060507) • another thing from Disney uh… like submarines London, it was from Zach and Cody, she had a umm shoe submarine… and so they had this and they were underwater so they couldn't see anything at all… and uh, they had to throw the, they were, got stuck and they didn't have any air left… so they had to throw to, throw all of the shoes out. (O5070309) • that… that it feels like we're in Art or something because we making crafts… (O5070510)
Questioning	*Interrogating an idea in the text (and included graphics), its applications to the real world, or the experience of reading the text*	• I'm wondering how they died. (B3040205) • Why do they name the ships weird? is that a different language? (B1020502) • I'm wondering umm what they're going to talk about with Michael Anderson. (B3050406) • I'm feeling that… umm… I'm wondering what kind of fish this is. (E3040305) • oh wow. how industries need water? (E5070501) • umm… I'm thinking that… I wonder what that helicopter is doing, but I just found out some little sprinklers, like watering it and… (E5070510) • how do we do this? (O3040205) • … so you put it over? (O4060208) • which one of these are we going to use? (O2030504) • umm… is the book gonna tell me what a periscope is? (O5070510)
Elaborating	*Extending an idea explicitly stated or shown in the text by, for instance, providing additional examples*	• I'm thinking that Michael will always be remembered… umm… he's always going to be remembered to the other astronauts that he taught… and he's no longer in any pain. (B1010201) • I'm thinking that people need to drink all their water or they're, it's wasting too much water… and juice is made out of water. they just add stuff to it. so… (E1010301) • umm… uh I'm thinking that if there's… um an extinction of preys, the predators would have to move to a different place to find other… umm… ah fish to eat or preys, to find more and not become extinct (E3050506)

Learning From Text		
Code	***Description***	***Examples***
Repeating Text	*Stating again the recently-read text, using virtually the same words in the text*	• 70% of the Earth is covered with water and only 3% of the water is actually fresh fresh water. (E5070510) • make a hole in the back of the carton. (O1010201) • that to cut the lines to make two slots. (O2070210) • and then it says the mirror should be facing down… and the bottom mirror facing up. (O1020501) • level with the bottom mirror. (O1020501)
Summarizing	*Recounting the events or information in the text (locally or globally)* **in the readers' own words***; usually goes beyond the idea in the most recently-read sentence to also or instead include information in earlier sentences, paragraphs, or sections*	• that it's about a little boy who wants to become an astronaut. (B1010202) • he wanted his dream to come true and his parents are encouraging him to do stuff. (B1010302) • and umm that it gives the whole story of his life so. (B5070509) • there's a lot of ways to use water in the world. a lot. (E1010201) • I'm thinking that this book talks about water and how you can save it and how you can waste it. and who needs it and who doesn't. (E1010202) • I'm thinking that we just cut, put holes in the box. (E1010201) • I'm thinking that uh in submarines the periscopes are bigger and they make it so that the thing they are looking at is, looks like it is closer and bigger. (E1020402)
Text Reading	*Talking about what and how to read pages, parts of pages, parts of sections, or graphics during reading*	• do I have to read this? (B2030203) • where was I again? (B3040306) • can I read up here? (B4060408) • is there another page? (E1020401) • there's a red star. (E5070309) • do I read the materials? (O1020501) • want me to continue reading. (O3050506)

Monitoring		
Code	***Description***	***Examples***
Text Characteristics	*Commenting on specific aspects of the text (and its included graphics), such as its difficulty, tone, or the authors' biases.*	• but I don't really know what this thing is on top. (B1010301) • umm… umm I'm just wondering why they didn't say, you know where was it, extinct instead of die out… well they said extinct, no they said die out instead of extinct, extinct well they said extinct, no they said die out instead of extinct, extinct. (E3050405) • Umm… I'm thinking that… that was kind of a lot of stuff that we need water for. and we only read like one paragraph of it (E5070510 – *double coded with Evaluating Content*)
Knowledge	*Commenting on the relationship between the text and the reader's prior knowledge*	• umm I'm thinking that I didn't know who Michael P Anderson was until I, I'm reading this book. (B5070510) • I thought all astronauts had to wear light (B4060408) • and I heard about him but not that much. but we learned it in second grade but I didn't go here in second grade. I only came here in kindergarten. (B4060307) • well umm I never knew that we had to replace the water that was used by our bodies. (E1020502) • umm… reading this book's making me feel like I never knew this stuff before. (E1020502) • I've never done it (O3050505) • umm like usually when I'm doing something, a project or something, it never works… so yeah… (O1020502)
Processing	*Commenting on the reader's reading and processing of text (e.g., his/her reading purposes, strategies, progress toward reading goal)*	• I'm done… I'm thinking I am done. (B1010201) • I read a lot of pages… and words . (B1010201) • umm kind of tired and kind of sad because my I'm kind of losing my voice. (B5070210) • I'm feeling excited… because… it's fun to be excited. (E4060207) • hold on. (O4060208) • ok. (O4060208 – *after physically acting out the step described in the text*) • there. (O1020501 – *after physically acting out the step described in the text*)

Monitoring		
Code	***Description***	***Examples***
Problems	*Commenting on obstacles encountered or solutions applied to overcome these obstacles while reading the text, such as: reading pace, unknown words, comprehension break-downs, and ineffective behaviors*	• got it. (O5070510 – *after physically acting out the step described in the text*) • I'm thinking that I keep messing up on words, that I already know. (B4060507) • … I can't try this one because it's a long word. (B4060307) • oh I read that line, (E5070509) • sorry if my square's a little diagonal… it's a little hard to draw a square on such a hard thing to cut. (O5070209) • this is wider. (O3050405) • wait, yeah this part. (O1020502) • that doesn't look like a square. (O1020502) • I'm thinking that umm umm I did the triangles the wrong way. (O5070509)

Evaluating		
Code	***Description***	***Examples***
Mindset	*Stating the reader's initial affective assessment of the text (and included graphics) before reading (e.g., uncritical acceptance of authors' ideas, skepticism)*	• I'm thinking I hope this is a good book. (B2030503) • umm… I think this is going to be really interesting. (E3040306) • I'm thinking if this is going to be a good… story. (E2030503) • umm I'm thinking that, that it's going to take a lot of work to do it. (O1010202) • umm I'm feeling confident that we are going to read this book and then make something. (O5070209) • umm I'm feeling that umm… I'm feeling like this is going to be a good project. (O3040305) • umm I'm thinking since you told me that I can't make it without using the book that I'm kind of a little nervous. (O5070510)

Evaluating		
Code	***Description***	***Examples***
Content	*Commenting on the reader's affective assessment of the text (and included graphics) during reading, including his/her perceptions of: the trustworthiness, engagingness, or quality of the information; approval and disapproval of author's ideas; and personal reactions to the text*	• I'm happy because I like books. (B4060207) • and I feel sad for his astronaut friends that he's dead. (B5070209) • and I'm happy to read about him. (B4060507) • umm… that… he was born like a kind of a long time ago but not really. (B5070510) • I am feeling happy for the farmers because water makes the soil softer. (E5070209) • I'm feeling bad for the fish that might live in lakes or rivers. (E5070209) • cool! (O1010201) • uh… I'm thinking that… this project will be good umm I mean… I mean I think that [name of another student] will love this project too. (O3040306) • umm that this is very fun. (O5070510) • umm that's a really weird, periscope. (O5070510)
Style	*Commenting on the quality of the writing (and included graphics) or (physical) text*	• I can still read it. (B4060308; *after a discussion of the physical condition of the pages*) • I'm, I'm thinking about how long the story was. (O4060307) • that that was a hard word. (O5070410)

Other		
Code	***Description***	***Examples***
Additional Action	*Discussing specific actions that the reader will or may take after reading*	• I'm thinking that I'm going to look him up on Google, see what else he did. (B1020502) • I'm, I'm gonna ask my teacher that but she don't know… (E4060308) • umm… I'm thinking of ways that could help our Earth. (E4060407)

Other		
Code	***Description***	***Examples***
	the text	• and I'm going to tell my mom that we need to recycle because all of our like stuff that is like pop cans or plastic go in this big pile and it will like ruin the Earth. (E1020502) • that you can make your own periscope at home. (O5070209) • and I might do it again if I get the materials. (5070510)
Self-Direction	*Verbalizing imperatives about the next action that the reader will take*	• on the A. (O5070210) • then I do that. (O3040306) • use the pencil. (O5070309) • I'll do that right… (O5070310)
Unrelated	*Commenting on topics that are clearly not related to the focal text, topic, or reading experience*	• I'm thinking… about Christmas. (B4060207) • and umm… I'm going to be having a sleepover because my mom said umm that I could pick umm a couple of kids from my school. then I can have two from my neighbors. (B4060307) • I'm thinking about… about my family… that they help us make lemonade. (E4060207) • because… I can sing. (O3040206) • I was going to tell you how cool it was when I went to Disney World. (O5070209)
Uninterpretable	*Verbalizing words or phrases whose meaning cannot be reliably understood*	• I… I am thinking about what's… what's on this page. (B4060407) • ok so that's. (O5070509) • this… (O5070510) • yeah so it would be… do, do, do. (O5070509)