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THE EFFICACY OF PERSPECTIVE INSTANTIATION IN IMPROVING MIDDLE SCHOOL STUDENTS' COMPREHENSION OF INFORMATIONAL TEXT

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ABSTRACT

This pretest posttest control group design study investigated whether assigning a perspective to fifth grade (*n*=74) and sixth grade (*n*=74) students prior to reading a long informational text would improve their performance on multiple measures of comprehension. All participants read an informational text on the topic the Wright Brothers, a passage that described how birds and bicycles influenced the invention of the airplane. While all participants read the same text, they were randomly assigned to one of three experimental conditions. Each condition was provided a different set of reading instructions that directed them to read the text from one of three perspectives: Bird perspective, Bicycle perspective, or Student perspective (comparison group). It was hypothesized that students who read from an assigned perspective—regardless of what the perspective was—would outperform those who did not read from a perspective on multiple measures of comprehension. It was further hypothesized that, when assigned a perspective, students would recall more text content that was relevant to their perspective than would those who read from either the alternative perspective or from the comparison perspective. Findings indicated statistically significant learning gains from pre- to posttest regardless of perspective, but that perspective assignment did not differentially benefit students' comprehension overall or on perspective-relevant items. Previous research has demonstrated benefit from perspective instantiation in college age students and adults who read short narrative texts in experimental settings. The current study extends perspective research by testing the efficacy of perspective instantiation in middle school learners who read a longer informational text in a school setting.

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Chapter 1

Introduction

One hundred fifty years ago in the United States children who were 11 or 12 years old may, or may not, have attended school. Those who did likely attended an ungraded, one-room school where, next to classmates both younger and older than themselves, they acquired the fundamentals known nostalgically as the three Rs. Reading was a fundamental. Yet, text materials were scant and those that were available may well have been purchased with funds from the singular teacher's own meager salary. Inside or outside of school, available reading material may have included the Bible, by 1888 a Sears & Roebuck mail order catalog, by 1936 one of McGuffey's readers, a few books owned by the family, or a community newspaper.

The school experience of learners that age has changed. Today those same 11 or 12 year-olds would be considered fifth and sixth graders. They would be assigned to grade-level teams in a middle school, a concept in school design that caters to the unique developmental needs of preadolescents and adolescents. Middle schools are places where curriculum integration occurs deliberately across teams, but where content areas are separate and taught by teachers with domain expertise.

Not only has 'school' changed, but so too has the notion of 'text' (e.g., Buschman, 2009; Leu, Coiro, Castek, Hartman, Henry, & Reinking, 2008). While traditional textbooks still dominate content area classrooms (Conderman & Elf, 2007; Tyson-Bernstein, 1988), innumerable other informational texts are available to both students and teachers. In addition to the Bible, the Sears Catalog, books, and newspapers—all still readily available in both print and electronic formats—students have access to many other types of text sources.

Within each content area domain, countless informational text sources are available to convey information. Students are savvy browsers whose online search engine solicitations can yield literally millions of 'hits' in response to their queries. Reading is a critical life skill (Kist, 2003; Shanahan & Shanahan, 2008); and it is a critical academic skill. The current study focuses on students' struggle to extract and comprehend critical information from these text sources. Specifically, this research is an investigation of the extent to which assigning middle grades students a perspective prior to reading may improve their comprehension of the text information they routinely encounter in content area courses.

Reading Comprehension

Reading comprehension is commonly understood as a recursive interaction among reader, text, and learning context (RAND Reading Study Group, 2002; Whitaker, Gambrell, & Morrow, 2004). From the primary grades to middle school, the nature of both texts and readers changes; and many students are challenged to successfully engage in comprehension tasks (National Assessment Governing Board, 2008; NICHD, 2000; RAND Reading Study Group, 2002). It is clear from recent reports that in spite of increased attention to learners' content area comprehension, middle school students continue to be challenged by tasks requiring them to comprehend informational texts (e.g., Biancarosa & Snow, 2006; Lee, Grigg, & Donahue, 2007).

Typically, reading comprehension improves through fourth grade then performance fluctuates and plateaus during middle school (Lee et al., 2007). These trends are not surprising given that attention to reading comprehension in the middle grades has not equaled that directed to younger learners. In recent years many have expressed concern for lack of attention to adolescent literacy and development of critical content area comprehension (Moje, 2008a; Moore, Bean, Birdyshaw, & Rycik, 1999). For example, in their *Reading Next* report on

adolescent literacy, Biancarosa and Snow (2006) acknowledge the gains in early reading precipitated by the *Early Reading First* legislation of 2002. Yet they observe that reading in the primary grades focuses primarily on word recognition. They caution that "many excellent third-grade readers will falter or fail in later-grade academic tasks if the teaching of reading is neglected in the middle and secondary grades" (p. 1) where reading focuses on comprehension and other more advanced literacy skills. While students may be sufficiently literate to employ basic reading skills such as decoding, they may be simultaneously unable to make the deeper connections necessary for building content area knowledge from their reading of informational text (Biancarosa & Snow, 2006; Moje, 2008a; Myers & Savage, 2005). Thus, reading instruction must continue in the middle grades and should focus on strategies related to content area comprehension.

Content Area Reading Comprehension

Content area teachers face a host of instructional challenges when they provide informational texts for middle school students' independent reading. At play are myriad individual difference variables students bring to reading tasks such as prior content knowledge, reading ability, interest in the topic, and beliefs about content-specific ideas and concepts. The text itself can also present challenges. When assigning informational texts, content area teachers must consider, among other factors, genre (e.g., literary, informational), domain-specific text demands (e.g., formulas found in mathematics texts; sequence structures often employed in history texts) (e.g., Moje, 2008a; Shanahan & Shanahan, 2008), and appropriateness to students' reading level and interest (e.g., Combs, 2004; Wade, Buxton, & Kelly, 1999).

Additionally, instructors must consider variables related to the reading task itself. Why and how students engage with informational texts will affect their comprehension (e.g., Bråten &

Samuelstuen, 2004; Kaakinen, Hyönä, & Keenan, 2002; Narvaez, van den Broek, & Ruiz; 1999; Rosenblatt, 1982). Altering the nature of the reading task by manipulating reading instructions may facilitate comprehension (e.g., Bråten, & Samuelstuen, 2004; Cerdán, Vidal-Abarca, Martínez, Gilabert, & Gil, 2009; Kardash, Royer, & Greene, 1988; McCrudden, Schraw, & Kambe, 2005). The current study examines several pertinent learner variables while targeting a specific instructional manipulation for improving middle school students' comprehension of the informational texts assigned to them in their content area courses.

Learners, Texts, and Instruction

Learners. Individual difference variables factor significantly into reading comprehension (e.g., Alexander, Kulikowich, & Jetton, 1994). The design employed in the current study controls for several of these critical variables. Specifically, in this work students' reading ability, topic interest, prior content knowledge, and beliefs about the text topic are addressed. Learner variables, however, are insufficient to explain how meaning is made from text. The nature of the text itself is a factor as well.

Texts. Expository texts, commonly found in middle school, are considered to be more difficult for students to comprehend than narrative texts (e.g., Alvermann & Boothby, 1982; Spiro & Taylor, 1980). For learners new to the demands of middle school reading, these informational texts permeate content area curricula and present unique challenges depending on the domain perspective from which a specific text is written. Domain-specific texts are characterized by their frames; that is, by the concepts, ideas, and patterns that pervade each discipline's thinking and writing (Anderson & Armbruster, 1984). Readers are challenged to navigate these frames as they vary across content area courses (e.g., Shanahan & Shanahan,

2008). Thus, comprehension of content area texts requires both general skills and the specific comprehension skills and strategies unique to each content area or domain.

Instruction. Students come to reading tasks for different purposes **(**Lorch, Lorch, & Klusewitz, 1993; Rosenblatt, 1982). Why and how learners approach a reading task shapes their interaction with the text. Thus, when teachers direct students to read independently, they control the nature of the assigned comprehension task. Instructors decide, for example, whether to provide pre-reading questions; to direct students to specific information within the text; or simply to assign students, without further elaboration, to read. Some instructional manipulations may facilitate reading comprehension by directing learner attention to relevant text content (e.g., Kaakinen et al., 2002; McCrudden et al., 2005; Schraw & Dennison, 1994).

Relevance Research

It is widely accepted that instructional strategies play a role in enhancing readers' comprehension (e.g., Biancarosa & Snow, 2006; Graves & Liang, 2008; NICHD, 2000). In contrast to the strategies students can employ to aid their own comprehension, teachers can select instructional approaches that also facilitate comprehension. Of interest in the current study are the instructional strategies designed to direct reader attention to relevant text content. They are instructional manipulations, broadly referred to as *relevance instructions* (e.g., McCrudden & Schraw, 2007).

Relevance manipulations are directed orally or in writing and serve to control students' attention allocation during independent reading. There are numerous mechanisms teachers can use to direct readers' attention to relevant text. Among those established in the research literature are specifying a purpose for reading (e.g., Linderholm & van den Broek, 2002; Narvaez et al., 1999), providing focused instructions or questions (e.g., Cerdán et al., 2009; McCrudden,

Schraw, & Hartley, 2006), and assigning readers a perspective from which to read the text (Kaakinen, & Hyönä, 2005; Schraw & Dennison, 1994). All of these strategies can be generally classified as relevance manipulations.

Relevance manipulations are hypothesized to function either by selective attention processes (e.g., Anderson & Reynolds, 1982; Lapan & Reynolds, 1994), such that the reader allocates additional attention to relevant segments; or by processes that promote comprehension efficiency such that attention is directed to relevant text without additional effort (McCrudden et al., 2005; 2006). In either case, relevance manipulations provide the reader with clearly specified goals (e.g., McCrudden & Schraw, 2007) allowing them to attend to only the most relevant information.

Relevance instructions also are reported to serve compensatory functions for readers. For example, relevance manipulations may compensate for breaks in global text coherence (Lehman & Schraw, 2002); that is, when readers do not deeply integrate text ideas within existing prior knowledge structures. Relevance instructions may also compensate for low working memory span (DiVesta & DiCintio, 1997) or for the mismatch between what text is important by virtue of the text itself (i.e., text-based) and what is important as a function of the reading task (i.e., task-based importance) (Schraw, Wade, & Kardash, 1993).

The focus of the current study is perspective instantiation, a particular type of relevance instruction. Research findings suggest that perspective instantiation can increase interest and learning from text (e.g., Ramsay & Sperling, 2010; Schraw & Dennison, 1994). However, the existing literature is somewhat limited as most previous studies employed short narrative texts (e.g., DiVesta & DiCintio, 1997; Kardash, et al., 1988; see Ramsay & Sperling, 2010, for an exception), examined effects on primarily undergraduate Educational Psychology students (e.g.,

Goetz, Shallert, Reynolds, & Radin, 1983; Kaakinen et al., 2002), and implemented the strategy within tightly controlled experimental settings.

The current study extends the existing literature on perspective instantiation in three important ways. First, it employs a text that is informational rather than narrative and that is longer than most texts employed in previous research. Second, it examines the benefit of the instructional manipulation for younger readers' comprehension. Finally, this research extends the literature by testing the approach in an authentic, school-based learning environment versus the limited confines of a controlled experiment in the laboratory. To further explore the generalizability of the instructional strategy, the study employs a text topic that fits within an existing school curriculum.

Perspective Instantiation

This study investigated the effect of perspective instantiation on middle level learners' reading comprehension. Middle school students are known to struggle to comprehend informational texts in their content area courses. Perspective instantiation has been shown to benefit undergraduate and adult learners when they read short, primarily narrative, texts in controlled experiments. Perhaps perspective instantiation can also improve comprehension for younger learners in school-based settings where they are challenged by longer informational texts. Generally, the study addressed two questions: Does reading from a perspective make a difference in learners' overall comprehension? When learners read from a perspective, do they demonstrate better comprehension of perspective-relevant information?

The text, an expository passage on the topic the Wright Brothers, was intended to be representative of those commonly encountered by learners in middle schools and designed to be relevant to readers approaching the text from two different perspectives that were instantiated

prior to reading. One perspective supported that the Wright Brothers relied on their knowledge of *Birds* to develop their airplane; the second supported that the brothers relied on their knowledge of *Bicycles* to build their airplane. The text and corresponding perspectives were employed to evaluate the degree to which reading from an a priori reading perspective benefited learners' comprehension. Given the expository text about the Wright Brothers, there were three hypotheses:

Hypothesis 1: Students who read from an assigned perspective—regardless of what the perspective is—will outperform those who do not read from a perspective.

PERSPECTIVE > NO PERSPECTIVE

Hypothesis 2: Students who read from an assigned perspective will perform similarly to one another on outcome measures and will perform better than those in the comparison group.

BIRD=BIKE>COMP

Hypothesis 3: Students who read from an assigned perspective will recall more information from their own perspective than from either the alternative perspective or the comparison perspective.

For Bird-relevant information: BIRD>BIKE>COMP

For Bike-relevant information: BIKE>BIRD>COMP

These hypotheses are grounded in theory and based on previous research. A fundamental assumption underlying this research was that if readers were provided information to direct them

to the most relevant text content, they would be better able to attend to relevant information and, thus, to remember it. For practitioners interested in improving middle school students' comprehension, unfortunately, most existing perspective instantiation research has relied on controlled studies that employed short texts with older learners (e.g., Kaakinen & Hyönä, 2005; Kardash et al., 1988). No previous research has examined the effects of perspective instantiation in younger learners with authentic texts. The current work examined the extent to which assigning middle school readers a perspective prior to reading an expository text in the context of their history classes can serve to facilitate learning.

Chapter 2

Review of Literature

Perspective instantiation is an instructional manipulation designed to improve comprehension and learning by directing student attention toward relevant text. The current study investigates the extent to which such a manipulation may help middle school readers to better comprehend their content area texts. This chapter overviews the current status of reading comprehension among middle level learners and considers ways that critical variables related to learner, text, and instruction impact comprehension of informational passages. In addition, it describes perspective instantiation as a relevance manipulation; that is, a category of instructional approaches designed to focus learner attention on relevant text. Finally, the scope of research on perspective instantiation is presented as one that has, to date, not provided convincing evidence of the generalizability of perspective instantiation to middle level learners in academic settings.

Reading Comprehension: Current Status in the Middle Grades

Despite efforts over the last decade to improve adolescent literacy and comprehension (e.g., Bates, Breslow, & Hupert, 2009; Ippolito, 2008; Palumbo & Sanacore, 2009; Shanahan & Shanahan, 2008), middle school students struggle to comprehend their content area texts (e.g., Lee, et al, 2007). In fact, there is ample evidence to support that students' performance on comprehension tasks plateaus when they enter middle school. According to the National Assessment of Educational Progress (NAEP) (Lee et al., 2007), fourth graders in 2000 posted an average reading score of 213 (SEM=1.3). In 2007, the average score rose to 221 (SEM= .03), the highest point since 1992. In contrast, eighth grade students finishing middle school scored an average 264 points (SEM=0.2) in 2002. This average score *dropped* to 263 (SEM=0.2) in 2007, a

statistically significant decrease over the five-year period. The long-term trend data for eighth grade indicate that average scores in 2007 were significantly higher than scores in 2005, significantly lower than in 2002, and the same as in 2003. Thus, over the last decade scores have fluctuated at times but improved little among eighth graders. In short, the percentage of fourth graders performing at or above the proficient level has been rising significantly, while eighth grade scores have remained static.

Reading comprehension is commonly understood as a recursive interaction among reader, text, and learning context (RAND Reading Study Group, 2002; Whitaker et al., 2004). Given this definition of comprehension, the root of the comprehension problem among middle grades students could be the text, individual learner differences, the instruction surrounding their interaction, or some combination of all three variables. To be sure, there are many potential explanations for students' comprehension challenges, and these listed are but a few of the possibilities. Nonetheless, to improve reading comprehension among middle level learners, the interactive components of comprehension must be considered.

Critical Comprehension Variables

Learners. By middle school, students are not only expected to read and comprehend expository text, but they are expected to do so independently and for the purpose of acquiring new knowledge (Blanton, Wood, & Taylor, 2007). However, Stevens (2003) notes a "mismatch" (p.138) evident in many middle schools where issues of school curricula and structures fail to align with the developmental needs of preadolescents and adolescents. Blanton et al. (2007), for example, recently underscored this persistent problem noting that by fourth grade, students have received insufficient exposure to instruction relative to reading expository

texts. At play are at least four individual difference variables students bring to reading tasks: (1) reading ability, (2) topic interest, (3), prior knowledge of the topic, (4) and topic beliefs.

Reading ability. Reading ability is a critical individual difference variable. Research suggests that by fourth grade, students should be adept at basic reading skills and prepared to utilize reading as a tool for acquiring new information in content areas (e.g., Blanton et al., 2007). Yet, reports on adolescent literacy suggest that many readers may not possess the critical skills necessary for making this transition (e.g., Biancarosa & Snow, 2006; Chall & Jacobs, 2003; NICHD, 2000).

Students may lack essential skills such as proficiency in phonics, phonemic awareness, fluency, vocabulary, and comprehension (NICHD, 2000). While all five skills are necessary for effective content area comprehension, they are not all acquired at the same rate (Duffy, 2009). Instead, some skills serve as building blocks for others. Deficiencies in skills such as fluency and vocabulary knowledge, for example, impose high cognitive demand at the word level and leave little working memory capacity in reserve for comprehension and integration of new information with prior knowledge (e.g., LaBerge & Samuels, 1974; Perfetti, 1995). In the current work reading ability is addressed by using a standardized reading test score to control for the effect of reading ability on comprehension.

Topic interest. Interest is also an important variable in learning and text comprehension. Interest can vary by both individual and contextual factors. In the research literature, these factors are differentiated by definitions of individual and situational interest (e.g., Ainley, Hidi, & Berndorff, 2002; Hidi & Harackiewicz, 2000; Krapp, Hidi, & Renninger, 1992; Schraw, Bruning, & Svoboda, 1995). Individual interest is described as stable and enduring over time and is derived from a person's unique preferences and predispositions for particular topics or

activities. Situational interest, in contrast, is a more transitory form of interest that is environmentally stimulated and context-specific.

In a host of studies, interest is characterized by increased cognitive effort (Alexander et al., 1994; Hidi & Baird, 1986; Schiefele, 1991); increased attention (e.g., Durik & Harackiewicz, 2007; Krapp et.al, 1992; Schraw & Dennison, 1994); increased enjoyment and pleasure (Hidi & Harackiewicz, 2000; Schiefele, 1991, 1992); an increased desire to learn (Ainley et al., 1992); and increased persistence (e.g., Ainley et al.; Hidi & Harackiewicz, 2000), sometimes in spite of finding the task to be difficult (Durik & Harackiewicz, 2007; Mitchell, 1993). These characteristics are known to relate to student learning and improved performance. In the current work, interest is measured at the topic level (i.e., individual interest in text-related topics) prior to reading and at the text-specific level (i.e., situational interest in the text) immediately after reading.

Topic knowledge. The critical role of prior knowledge in new learning is well-documented (e.g., Ausubel, 1969, Bransford & Johnson, 1972; Dochy, Segers, & Buehl, 1999; Recht & Leslie, 1988; Wolfe & Mienko, 2007). As Alexander, Kulikowich and Jetton (1994) noted, "it is difficult to overestimate how much individuals' prior knowledge contributes to future learning within a particular field of study" (p. 201). As prior knowledge is a broad term often used to refer to varying levels of existing knowledge, it is important to separate domain knowledge from topic knowledge (e.g., Alexander, Schulze, & Kulikowich, 1994; Shapiro, 2004). Domain knowledge is broad knowledge about a field of study such as History or Biology (Alexander, Shallert, & Hare, 1991). When specific prior knowledge within a domain is evoked for the purpose of comprehending text content, it is referred to as *topic knowledge* (Alexander et al., 1991) or *topic-relevant prior knowledge* (Ozuru, Dempsey, & McNamara, 2009).

Beliefs. As reading ability, prior topic knowledge, and interest are vital to new learning, so too are students' pre-existing beliefs about the text topic (e.g., Murphy & Mason, 2006). The attitudes and beliefs that students bring to a task can bias how new information is processed (Petty & Cacioppo, 1986). More specifically, when presented with more than one perspective on a topic, one way that learners can respond is by considering only their own perspective on the issue, a propensity referred to as *my-side bias* (Perkins, Farady, & Bushy, 1991).

Nussbaum and Kardash (2005, Experiment 2) conducted a study of undergraduate students assigned to write an essay about whether television contributed to increased violence in children. They obtained a measure of "extremity of prior belief" (p. 159) and tested whether these pre-existing beliefs about TV violence influenced the degree to which the students were able to construct arguments counter to their perspective following the reading of a related two-sided text passage. Findings indicated that those with extreme pre-existing beliefs about the topic were less likely to identify counterarguments when directed to write a persuasive essay (i.e., to take a perspective). The researchers' conclusions supported that extreme beliefs may interfere with text processing.

Not all texts, however, are sided; nor do they necessarily tap "extreme beliefs." It should also be clear that assuming a perspective is not the same as taking a side. In the current study, an historical event is cast as having been influenced by two different factors and students are assigned a reading perspective that directs them to focus on one or the other factor. Thus, perspective instantiation assumes that even informational texts, which are not intentionally persuasive or necessarily high-affect, can be read from a perspective. Still it is possible that relatively affect-neutral beliefs may come into play when readers are asked to read from a perspective. Given the research noted, readers' preexisting beliefs may either contribute to or

interfere with their ability to assume an assigned perspective or, in fact, process information related to a perspective that is counter to the one they hold.

The distinction between beliefs and knowledge is unclear in much of the research literature (e.g., Murphy & Mason, 2006; Southerland, Sinatra, & Mathews, 2001). The two constructs will be differentiated in the current study based upon Murphy and Mason's (2005) definitions of each: beliefs as "all that one accepts as or wants to be true" (p. 306) and knowledge as "all that is accepted as true that can be externally verified and can be confirmed by others on repeated interactions with the object" (p.306). The present study incorporates a measure of learners' beliefs about the text topic.

Texts. As learners vary, so do texts. When assigning text reading, instructors must consider such text variables as genre, domain, difficulty, and interestingness.

Genre. Informational text is the focus of the present investigation. Comprehension of informational texts is a critical academic skill for survival in content area courses; and it is a critical life skill necessary for survival in the 21st century (IRA, 2008/2009). Within the category of informational texts, the 2009 Reading Framework for the National Assessment of Educational Progress (NAEP) includes exposition, argumentation and persuasive texts, and procedural texts and documents (NAGB, 2008). The current study focuses on the type of informational text known as exposition.

Exposition is described by NAEP (NAGB) as text which "presents information, provides explanations and definitions, and compares and contrasts" (p. 10). Examples of exposition include an excerpt about cell division in a Biology textbook, a newspaper article that describes a military engagement, or a trade book about John Wesley Powell and his adventures down the Colorado River. Expository texts are distinct from argument and persuasive texts, two other

classifications of informational texts, because there is no purposeful intent on the part of the author to influence the reader. When informational text is discussed in the present study, it refers to the exposition students routinely encounter in their content area courses.

Domains. Some reading comprehension skills and strategies are general and transfer broadly. Others are unique to specific domains of study, since the ways that knowledge is constructed and shared varies by domain (Shanahan & Shanahan, 2008). Some texts are necessarily written to communicate procedural information; while others are intended to convey declarative information. For example, mathematics texts are not written the same way as history texts. One way researchers have tried to understand the difference is by studying experts in specific domains (e.g., Shanahan & Shanahan; Wineburg, 1991). For example, Mathematics text is procedural in nature and replete with symbols and formulas that represent mathematical truths. Mathematicians have noted students' need to read texts carefully and to be alert for words with different levels of meaning and for symbols representing critical variables (Shanahan & Shanahan).

History texts, in contrast, detail the author's representation of the truth (e.g., Benjamin, 2007; Damico, Baildon, Exter, & Guo, 2009/2010). Moje (2008b) argued that understanding history texts demands that students "examine texts for attribution" (p.64), for the *who, what, when, where,* and *why* of author voice and intent. Paxton (1999) noted that the expository nature of history text masks the author's voice that has shaped it, a text characteristic that requires the additional skill of recognizing and understanding bias (Wineburg, 1991). Hidden by this author agency, the 'truth' of the text eludes students. Such inherent characteristics of history texts trap novice readers who unwittingly commit comprehension "failures" summarized by Wineburg as

> the failure to grasp the polemic of the text, the failure to recognize the connotations (not just the denotations) of words, the failure to situate the text in a disciplinary matrix, or the failure to do a host of other things that loom large when reading historical texts. (p.502)

Thus, how knowledge is transmitted via written discourse varies by discipline. Expanding the scope of instructional approaches that help students navigate the texts of different disciplines is critical. The current study employs a text on a topic in the domain of American history.

Difficulty. Text difficulty is often defined as 'readability.' Fry (2002) defined readability as "an objective numerical score obtained by applying a readability formula" (p. 286). While there are more than 200 readability formulas available (DuBay, 2004), readability is commonly derived from a combination of both syntactic and semantic factors measured relative to sentence length and word-length (Fry, 1977). The current study employed the Flesch-Kincaid reading formula (Flesch, 1948; Kincaid, Fishburne, Rogers, & Chissom, 1975), a readability formula readily available for use in mainstream computer software programs such as Microsoft Word. Text difficulty must be carefully balanced with text interestingness (Combs, 2004) when choosing texts or when assessing students on the basis of them.

Interestingness. Text interestingness is an important consideration in comprehension of exposition (e.g., Combs, 2004; Hidi & Baird, 1986). Across the span of a reading experience, learners can vary in their reported levels of interest and boredom (Ainley et al., 2002). Moreover, when learners are interested in the text, they persist in their reading of it. In contrast, when they report boredom, they are more likely to quit reading and not to pursue additional reading on the topic (Ainley, Corrigan, & Richardson, 2005). Some text features are known to be inherently

interesting to readers (see Hidi & Baird, 1986 and Schraw et al., 1995 for reviews). Text interestingness can also be a function of the interaction between the reader's personal interest in the topic and the specific content of the text (Ainley et al., 2002). The current study utilized the Perceived Interest Questionnaire (Schraw et al., 1995) to assess text interestingness. Text variables are among those that must factor into instructors' conditional knowledge when selecting approaches to aid students' comprehension.

Instruction. Practitioners struggle with supporting middle grades students in content area reading (e.g., Thompson, 2008). Over the history of American public education, this fact has been explained by the changing expectations of middle grades teachers for teaching content area reading; teachers' sometimes nostalgic urge to teach as they were taught rather than to infuse new instructional strategies into content area classrooms; the 'vaccination model' of reading as an isolated subject that, once 'administered,' need not be revisited (Bintz, 1997; Shanahan & Shanahan, 2008); and the perpetuation at the higher grades of the 'teacher-as-expert' myth that finds content-weak teachers circumventing literacy activities to avoid being exposed as someone not expert (McArthur, Penland, Spencer, & Anders, 2008). Where content area teachers do recognize the need to teach reading skills, many in the field were not trained to do so (e.g., Bintz, 1997). For all of these reasons, how much deliberate attention content area teachers pay to comprehension varies.

For those who recognize the need to support learners' comprehension, there are at least three categories of instructional approaches from which to choose: (1) student-level approaches, (2) teacher-level instructional approaches, (3) and relevance manipulations.

Student-level approaches. Some instructional approaches focus on comprehension strategy instruction; that is, instruction that teaches comprehension strategies to students.

Empirically-supported strategies include summarizing (e.g., Brown & Day, 1983; Jitendra, Hoppes, & Xin, 2000), comprehension monitoring (e.g., Pressley & Gaskins, 2006; Zinar, 2000), semantic mapping (e.g., Parker, Guillemard, Goetz, & Galarza, 1996; Symons, Richards, & Greene, 1995), and question generating (e.g. Almassi, 2008; King, 1990).

Teacher-level instructional approaches. Another instructional focus is the actual behaviors that teachers employ when they design and facilitate instructional activities to promote reading comprehension. These behaviors include using explicit instruction (e.g., Nichols, Young, & Rickelman, 2007; Parris & Block, 2007), varying student groupings (e.g., Applebee, Langer, Nystrand, & Gamoran, 2003; Parris & Block, 2007), organizing cooperative learning activities (e.g., Nichols et al., 2007; Stevens, 2006), scaffolding instruction (e.g., Langer, 2001), and modeling the teacher's own comprehension behaviors (Fisher, Frey, and Lapp, 2008).

Relevance manipulations. A third category of instructional approaches to improve comprehension, and the category of interest in the current study, focuses on directing learners' attention to the most relevant text content. Limitations of working memory capacity constrain students' ability to recall large amounts of text (Just & Carpenter, 1992). Thus, among effective comprehension strategies are those that compensate for working memory limitations. Providing learners with reading instructions that direct their attention to relevant text content is one such strategy. Such strategies or manipulations are externally directed by the teacher verbally or in writing and, arguably, guide students' attention allocation during reading.

Researchers have explored the effectiveness of numerous relevance manipulations. Among those examined are (1) providing a reading purpose, typically to read for entertainment or for study (Linderholm, Cong, & Zhao, 2008; Linderholm & van den Broek, 2002; Narvaez et al., 1999; van den Broek, Lorch, Linderholm, & Gustafson, 2001); (2) revealing instructional

objectives related to text reading (Duchastel, 1972; Rothkopf & Billington, 1979); (3) presenting questions, either before reading in the form of guiding questions (e.g., Cerdán et al., 2009) or during or after reading in the form of elaborative interrogation (e.g,, Boudreau, Wood, Willoughby, & Specht, 1999; Dornisch & Sperling, 2004, 2006; Ramsay, Sperling, & Dornisch, 2010; Seifert, 1994); and (4) assigning the reader a perspective from which to read a text (e.g., Anderson & Pichert, 1978; Goetz et al., 1983; Kaakinen et al., 2002; Pichert & Anderson, 1977).

Instructional approaches that direct learners' attention to relevant text can be teacher-selected for their appropriateness given the text in use, the students at hand, and the instructional goals and objectives. They can be specific instructions provided to the reader and, when they take this form, are referred to as relevance instructions (McCrudden & Schraw, 2007). Relevance instructions guide learners to engage with the text in a particular way such that they attend to the most relevant text.

Relevance Instructions

Relevance. The specific way that relevance instructions work can be framed within theories of relevance and attentional processing. Sperber and Wilson (1986) argued that, within any context, relevance is a function of the interaction between old and new information such that a desired goal can be efficiently met. In more simplistic terms related to text processing, relevance is the situated characteristic of a text that, in the mind of the reader at a moment in time, makes the text content worth learning. Such a determination is relative to the person and to the context invoked at the time of processing (Sperber & Wilson). Reynolds (1992) argued that a reader evaluates the relevance of text by its *salience*. Salience is the nature of text segments such that they are perceived by the reader to 'stand out.' Further, salience is determined by an interaction among text variables (i.e., informational versus narrative genres, domain frames),

reader variables (i.e., reading ability, interest, topic knowledge, and beliefs), and task variables (i.e., purpose, perspective) (Reynolds, 1992). Within this complex interaction, relevance manipulations function as task variables related to instruction.

Attention. What people pay attention to makes a difference in what they remember (e.g., Bunting, Cowan, & Colfish, 2008; James, 1890). Relevance manipulations exploit this phenomenon by helping the reader to know what information warrants attention. As the nature of the reading task is manipulated (e.g., by assigning the reader a perspective), predetermined criteria are established against which the reader evaluates text segments for relevance. In this way, relevance instructions point the reader toward relevant text information and away from irrelevant text information.

Relevance instructions improve comprehension and facilitate learning by directing reader attention. Historically, the selective attention hypothesis has offered explanations for how the relevance of text segments results in learning (e.g., Anderson & Reynolds, 1982; Lapan & Reynolds, 1994). However, researchers have debated whether selective attention results in more or less effort expended on relevant text segments.

One view contends that when text segments are deemed relevant by virtue of the task, the reader allocates additional attention to those segments. In turn, the segments are more readily recalled. Numerous studies provide support for this hypothesis (e.g., Goetz et al., 1983; Kaakinen & Hyönä, 2005). Alternatively, evidence has been reported for the no-increased-effort hypothesis (McCrudden et al., 2005, 2006). Substantiating this view, McCrudden and Schraw (2007) argued that, consistent with Sperber and Wilson's notion (1986) that reading goals facilitate comprehension efficiency, it is not necessary for more time to be allocated to salient text segments in order to make them more recallable. Rather, when a reader is provided specific

relevance instructions in advance of reading, goal-focusing leads to more efficient identification of salient segments (e.g., McCrudden et al., 2005). Such statements are recalled better without additional reader effort. Thus, criteria dictate either that additional attention is allocated to relevant segments (Kaakinen et al., 2002, 2005; Reynolds, 1992) or that reader attention is directed more efficiently to relevant segments (McCrudden et al., 2005, 2006), both resulting in greater recall of relevant text.

Purpose for Reading

Two specific relevance manipulations that function symbiotically to improve comprehension are establishing a purpose for reading and assigning readers a perspective from which to read (Ramsay & Sperling, in press). The first entails presenting learners with a clear purpose for reading (e.g., Bråten & Samuelstuen, 2004; Lehman & Schraw, 2002). Establishing a specific purpose for reading provides a reason or outcome for *why* the reading is necessary. In the research literature, purpose for reading is narrowly operationalized. Two foundational studies established extreme ends of a purpose continuum: reading for entertainment and reading for study (Greaney & Neuman, 1990; Lorch et al., 1993).

From early work on reading purpose, it is clear that even young learners are able to articulate particular purposes for reading. Taking the view that people read in order to fulfill a need, Greaney and Neuman (1990) collected essays from 8-, 10-, and 12-year-old students in fifteen countries on the topic of "Why I Like to Read." From the students' essays, ten functions of reading were identified. From these, factor analytic procedures indicated three super-ordinate categories: utility, enjoyment, and escapist. Over time, enjoyment and escapist were collapsed into the broader category *entertainment*. Similarly, in the much-cited study by Lorch et al. (1993), college students also identified ten distinct functions of reading across two broad

categories, reading for school and reading by choice. The students were not only able to identify independent purposes for reading but were able to distinguish among the cognitive demands required by different reading purposes and texts. Subsequent researchers extended this work to examine the effect of reading purpose on inference generation (Narvaez et al., 1999; van den Broek et al., 2001) as well as its effect on learners with different working memory capacities (Linderholm, et al., 2002, 2008).

In these studies that investigated reading purposes common in academic settings, some prompted students to read a text as if to prepare for an exam (Linderholm et al., 2008; Narvaez et al., 1999) or to prepare specifically for an essay exam (van den Broek et al., 2001). Bråten and Samuelstuen (2004) focused on study purposes to better understand differences among multiple study-related outcome tasks. They asked three conditions of participants either to read in preparation to take a test, to write a summary, or to engage in a discussion. They found that students employed different study strategies (e.g., memorization and summarization) depending on whether the purpose for reading was to prepare for a test or to discuss content with peers.

Related, though not congruent, is Rosenblatt's work on the aesthetic versus efferent experiences of learners during and after reading (e.g., 1982, 2005). She argued that a learner comes to a reading task with a predetermined purpose, or *stance* (1982). The reader's stance shapes how his or her attention will be allocated to different aspects of the text during reading. More specifically, when the reader pursues informational text, he or she often does so seeking to 'carry away' (i.e., efferent) information that will satisfy the purpose for reading. Such purposes may include gathering information to make a decision or to draw a conclusion. As the work of these researchers demonstrates, different purposes for reading are understood differently by learners and are important in shaping learners' interaction with a text. Importantly, when

students are presented a clear purpose for reading, they enter a reading experience knowing *why* they read.

Perspective Instantiation

A second type of relevance manipulation, and the focus of the current study, is *perspective instantiation*, an instructional approach that directs students in *how* they should read. Similar to providing a reading purpose, perspective instantiation functions to direct students' attention to the most relevant information of the text passage. As students read, their perspective sets parameters, or criteria, for what text content is most relevant. This enables them to focus their attention on that content. As described in the paragraphs that follow, perspective instantiation has been shown to benefit older learners when they read short, primarily narrative, texts in controlled experiments.

Theoretical foundations. Three decades ago, early studies (e.g., Anderson & Pichert, 1978; Pichert & Anderson, 1977) used different reading perspectives to investigate the encoding, storage, and retrieval effects of invoking a schema before or after reading. Researchers noted that "imposing a schema on a text simply means viewing the text from a certain perspective" (Pichert & Anderson, p.309). Perspective experiments were further guided by knowledge of attentional or selective resource allocation. That is, once a perspective is assigned, either before or after reading, the reader first unconsciously activates a corresponding schema. Then attention is selectively allocated to schema-relevant information and, thus, recalled better (e.g., Anderson & Pichert, 1978; Schraw & Dennison, 1994).

Guided by these theoretical frameworks, researchers found that when learners were provided a perspective prior to reading, the perspective influenced what they identified as important as well as what they recalled at posttest (Pichert & Anderson, 1977). Moreover,

changing perspective after reading resulted in recall of more information that was relevant to the new perspective and less information relevant to the initial perspective (Anderson & Pichert, 1978; Anderson, Pichert, & Shirey, 1983). Others reported similar effects when perspective was assigned only after reading (e.g., Ramsay & Sperling, 2010; Schraw & Dennison, 1994).

While the present study is framed within relevance and attentional processing theories, its historical roots in schema theory help to explain the critical role of prior topic knowledge when reader perspective is manipulated. Researchers and theorists past (e.g., Ausubel, 1969) and present (e.g., Alexander, 1997; Murphy, 2007) recognize the critical role of prior knowledge in learning. In accord with schema theory, topic-relevant prior knowledge may be organized within a schema; that is, a person's structural organization of world knowledge (Anderson, 1984). As people hold schemata for concepts, ideas, and events, schemata can be as unique as the people who hold them. From this theoretical viewpoint, comprehension of text is dependent, in part, upon how easily, accurately, and completely the text content corresponds to the reader's schema for the same content. In this way, perspective influences what information is recalled.

Perspective may also influence comprehension by guiding how much effort the learner expends on relevant text. As in the cases of other types of relevance instructions, one hypothesis holds that learners increase their effort to attend to perspective-relevant text. Evidence also supports an alternative hypothesis that, when the reader assumes a perspective, there is less demand for attention to relevant text. Thus, perspective allows the reader to direct attention more efficiently to perspective-relevant segments.

Several reading time studies of perspective instantiation reported support for the increased effort hypothesis (e.g., Goetz et al., 1983; Kaakinen et al., 2002; Kaakinen & Hyönä, 2005). These studies recorded reading time as one means of determining whether more attention

was allocated to perspective-relevant text segments. The theoretical hypothesis in these studies was that longer fixation times on relevant segments would indicate more attention allocation to those sentences.

In eye-tracking studies of perspective instantiation, Kaakinen and colleagues (2002, 2005) found that, not only did readers spend more time on perspective-relevant segments, but they spent that time engaged in different comprehension processes than those employed when reading perspective-irrelevant segments. Kaakinen and Hyönä (2005) examined such processing differences using both eye tracking and think aloud methods. Think aloud responses were coded by processing category (e.g., association, self-explanation, paraphrase, monitoring, and questioning). The researchers hypothesized that readers would engage in deeper processing of perspective-relevant segments as compared to perspective-irrelevant segments. While this hypothesis was not supported, learners did employ processing approaches differentially depending on the nature of the text segment. Specifically, the researchers reported that readers engaged more in paraphrasing of perspective-relevant than perspective-irrelevant text.

Research scope. While previous research has explored a range of outcome variables, it has also allowed for only limited generalization of the effects of perspective assignment. The literature base on the specific manipulation of perspective instantiation is relatively small. What follows is an overview of perspective instantiation studies that employed an experimental text and assigned readers a perspective to determine whether that perspective made a difference in learning or attentional focus. The description underscores the narrow literature base, highlighting the characteristics of study participants, experimental texts, instantiation, dependent or learning outcomes, and related and resultant effects.

Participants. The majority of participants in the existing relevance literature were adult learners. Only limited attention was directed toward characteristics of the participants or the readers. In 24 empirical studies reviewed, 82% of participants were college age or adult. Police officers (*n*=53) and real estate students (*n*=55) accounted for the only adults who were not undergraduates. American (*n*=1,327) and Finnish (*n*=102) students comprised the large pool of undergraduate participants. High school sophomores and juniors (*n*=215) and elementary second and fourth graders (*n*=119) accounted for the remaining 18% of participants across the studies. Clearly, what is known about perspective instantiation is primarily derived from research on undergraduate students and thus may have limited generalizability. The proposed study extends the range of researched populations by examining middle school learners.

Texts. Perspective researchers within relevance research have explored only a limited number of texts. Sixteen studies employed some variation of the House text, a narrative passage originally introduced by Pichert and Anderson (1977). Later studies modified the text by increasing its length (e.g., Goetz et al., 1983; Kardash et al., 1988; Schraw & Dennison, 1994) or adding elements to enhance its overall interestingness (Schraw & Dennison). At its longest, the House passage was known as "Pete and Mark Ditch School" and was 5-pages in length with 115 idea units (Schraw & Dennison).

Other short narrative texts were employed as well. One was a 56-idea unit passage about an island read from one of two perspectives, eccentric florist or shipwrecked sailor (Pichert & Anderson, 1977). In another set of experiments (Walczyck & Hall, 1991), two texts were utilized with elementary children: the well-known House passage, read from the perspective of either a burglar or a safety inspector and "A Frightening Car Ride," read from a police officer or auto mechanic perspective.

Only a limited number of perspective studies employed expository texts. Kaakinen et al. (2002) utilized a 798-word text that described four countries organized in a compare-contrast structure. Participants were assigned to assume the perspective of a scientist who would be moving to one of the countries and who needed to evaluate the country's relative quality on characteristics such as geography, economy, and government. Readers recalled significantly more perspective-relevant information than perspective-irrelevant information. Moreover, total fixation times and look-back times were longer for perspective-relevant text for all participants regardless of their working memory span. Participants with medium and longer working memory spans fixated on perspective-relevant segments longer at first-pass.

Another study provided a 960-word text about four rare diseases: trigeminusneuralgy, typhus, cystic fibrosis, and scleroderma (Kaakinen & Hyönä, 2005). The undergraduate participants had little prior knowledge of the diseases but were required to imagine they had a friend with either trigeminusneuralgy or typhus and needed to learn about the disease. Recall was greater and fixation times were longer for perspective-relevant text than for perspective-irrelevant text.

Also employing an expository text were Ramsay and Sperling (2010) whose three experiments required readers to assume either a Hero or Villain perspective (or No Perspective) as they read a text about Christopher Columbus. The Columbus text, with 3,041 words and 234 idea units, is the longest expository text, or text overall, used in perspective studies to date. Findings indicated significantly greater interest in perspective-relevant text than in perspective-irrelevant text.

Instantiation. Across the research, perspectives have been instantiated either before or after reading or both, depending upon experimental manipulation. Some studies reported simply

telling participants to read from one perspective or another and provided only general details about how the perspective prompt was articulated to participants (e.g., Goetz et al., 1983; Pichert & Anderson, 1977; Schraw et al., 1993). Others indicated a one-sentence direction as in the example of the Burglar/Homebuyer studies. Typical prompts in these experiments instructed students either to "read this story as if you were thinking about robbing this house" or "read this story as if you were interested in buying this house" (Schraw & Dennison, 1994).

Slightly more involved was instantiation used by Walczyk and Hall (1991) who had elementary students practice by imagining they were a doctor as they read a short text. Following the practice session, participants were instructed to pretend either to be a burglar or safety inspector, a police officer or an auto mechanic. Thus, learners were invited to assume the persona of someone with whom they could relate. The Walczyk and Hall study demonstrated that primary grade children could identify perspective-relevant statements.

In a few cases, the instruction to read from a perspective was more elaborate. As an example, Kaakinen and Hyönä (2005) instantiated the necessary perspectives by directing participants to

> Imagine that a close friend of yours has been diagnosed with trigminusneuralgy/ typhus [one of two diseases]. Everybody is very worried about this common friend, and you have agreed to find out some facts about the disease and to inform the others about it. Read the text in order to be able to do the job. (p. 245)

Thus, by means of a simple directive to read from a perspective, a one-sentence instruction, or an imaginative task described and practiced, participants have been assigned a perspective for reading experimental texts. These studies of the effectiveness of perspective instantiation resulted in perspective effects. Thus is seems that the range of prompts employed served the

experimental purposes. It is yet unknown the level of prompt required to adequately instantiate the required perspective when texts are longer and learners are younger.

Outcome variables. Relevance research on perspective instantiation has yielded important findings for a number of outcome variables. Measured outcomes included ratings of text segment importance (Goetz et al., 1983; Pichert & Anderson, 1977), relevance (Walczyk & Hall, 1991) and interestingness (Ramsay & Sperling, 2010; Schraw & Dennison, 1994); perspective-relevant recall (Anderson et al, 1983; Anderson & Pichert, 1978; DiVesta & DiCintio, 1997; Goetz et al., 1983; Kaakinen et al., 2002; Kaakinen & Hyönä, 2005; Kardash et al., 1988; Pichert & Anderson, 1977; Schraw et al., 1993; Schraw & Dennison, 1994; Walczyk & Hall, 1991); categories of inferences generated during processing (Kaakinen & Hyönä, 2005); comprehension monitoring as measured by error identification (Walczyk & Hall, 1991); reading time (Goetz et al., 1983); and eye fixation times (Kaakinen et al., 2002; Kaakinen & Hyönä, 2005).

Some studies measured how learners rated text segments for importance, relevance, or interest. When readers took a perspective then rated the importance or relevance of the text segments using Likert-type rating scales, they gave higher ratings to segments relevant to their assigned perspective (Goetz et al., 1983; Pichert & Anderson, 1977; Walczyk & Hall, 1991). Other studies required learners to rate text segments for interestingness and found higher ratings for perspective-relevant segments (Ramsay & Sperling, 2010; Schraw & Dennison, 1994).

Research has explored not only ratings of interest, relevance, and importance, but which segments are best recalled after reading. Pichert and Anderson (1977) found that perspective-relevant segments were recalled better at both immediate and delayed recall. This was later supported by a multitude of other studies (e.g., Anderson et al., 1983; DiVesta & DiCintio, 1997;

Kaakinen & Hyönä, 2005; Kardash, et al., 1988). One experiment (Anderson et al., 1983) measured recall two weeks after reading and found no difference for perspective readers compared with a No Perspective control. Therefore, while retrieval of information may be enhanced for some period after reading, an interval of two weeks may be too long.

While relevance enhances memory for perspective-relevant information even at delayed recall, individual difference variables such as working memory span may dictate the extent of the recall. For example, DiVesta and DiCintio (1997) found that low-working memory span readers recalled more relevant information at delayed recall but significantly less than their high-WMS peers. What readers identify as important can be relative to other text information or to the demands of the reading task (Schraw, Wade, & Kardash, 1993). For learners who have difficulty identifying important ideas in text, perspective may also compensate for mismatch between text-based and task-based importance. Underscoring the important distinction between relevance and importance, Schraw et al. (1993) found greater recall for perspective-relevant segments, even when the same segments were not considered to be text-important.

As noted, there is research support for greater recall of perspective-relevant segments when perspective is instantiated before reading (e.g., Pichert & Anderson, 1977; Schraw et al., 1993; Walczyk & Hall, 1991). Other work demonstrated similar effects when perspective shifted upon a second reading (Anderson & Pichert, 1978). Further, even when perspective was instantiated for the first time *after* reading, readers still recalled more perspective-relevant information (Schraw & Dennison, 1994).

In addition to effects on recall, researchers have explored the types of inferences generated during processing. According to construction-integration models of text processing (e.g., Graesser, Singer, & Trabasso, 1994; Kintsch, 1988), which routinely frame relevance

instruction studies, inference generation contributes to development of a memory representation of the text. Kaakinen and Hyönä (2005) used Think Aloud procedures to observe the types of inferences generated during processing. They asked study participants to read for the purpose of learning about a friend's newly-diagnosed disease and preparing to tell others about it. Results indicated statistically significant differences between deeper processing (i.e., self-explanations and questions) and shallower processing (i.e., associations and paraphrases) during readers' initial fixations as they encountered perspective-relevant sentences. The researchers reasoned that such inferences served to develop a more surface-level text representation rather than to enhance deeper processing.

Finally, reading and fixation times have been employed methodologically to examine readers' online behaviors. Recorded reading times demonstrated that more time was spent on perspective-relevant sentences than on perspective-irrelevant sentences (Goetz et al., 1983; Kaakinen et al., 2002). Yet, additional data on eye movements during reading suggested that when this focus occurs may depend upon working memory span (WMS) (Kaakinen et al). That is, the effect was exhibited in high-WMS readers upon their initial reading of a text; however, the relevance effect was evident in low-WMS readers only once they were given the opportunity to look back. These findings were in contrast to the earlier DiVesta and DiCintio (1997) conclusion that a relevance effect compensated for *low*-WMS. Differences may have been due to methodological precision of later experiments. Certainly, more experimental studies relating the relevance effect to individual differences are warranted.

In summary, existing literature on perspective instantiation supports that perspective can improve comprehension in college aged and adult learners who read short, primarily narrative, texts in controlled experiments. The proposed study investigates whether similar results can be

produced in a school setting with younger learners, such as those in middle school, who are assigned a perspective before reading an informational content area text.

Chapter 3

Method

As noted in Chapter 1, the following hypotheses guided the current investigation:

Hypothesis 1: Students who read from an assigned perspective—regardless of what the perspective is—will outperform those who do not read from a perspective.

Hypothesis 2: Students who read from an assigned perspective will perform similarly to one another on outcome measures and will perform better than those in the comparison group.

Hypothesis 3: Students who read from an assigned perspective will recall more information from their own perspective than from either the alternative perspective or the comparison perspective.

An experimental pretest-posttest design was employed to test hypotheses. The instructional manipulation was the independent variable with three levels: Bird perspective; Bike perspective; and Comparison perspective. The dependent variable comprehension was measured by multiple choice recognition and free recall items. Reading ability, prior topic knowledge, domain and situational interest, and beliefs about text content were additional variables. Table 1 presents an experimental design matrix that outlines independent and outcome variables and corresponding measures. This chapter describes the methodology as it pertains to the sample, instrumentation, and procedures.

Table 1

Experimental design

	Bird Perspective	Bike Perspective	Comparison
Prereading measures	Reading ability Demographics Topic interest Topic knowledge Beliefs	Reading ability Demographics Topic interest Topic knowledge Beliefs	Reading ability Demographics Topic interest Topic knowledge Beliefs
Instructional manipulation	Bird perspective instantiated via relevance instructions	Bike perspective instantiated via relevance instructions	Comparison perspective instantiated via relevance instructions
Postreading measures	Free recall Topic knowledge Perceived interest Beliefs	Free recall Topic knowledge Perceived Interest Beliefs	Free recall Topic knowledge Perceived Interest Beliefs

Participants

Participants were 72 fifth grade (48.6% male; 51.4% female) and 74 sixth grade (47.3% male; 52.7% female) students from a rural Pennsylvania school district where the fifth and sixth grades represent the first two grades in the middle school. Students participated as part of their heterogeneously grouped Social Studies class.

Recruitment. In early September, one teacher from each of the fifth and sixth grade teams was contacted via email. The proposed study was described and the teachers were asked whether they thought their grade-level teams would be interested in participating in the research study. The researcher offered to meet with the teams to describe the study and to address questions and concerns. A positive response was received from both teachers, and grade-level meetings were arranged. The middle school principal and the district superintendent were both

notified of the researcher's intent and of the teachers' interest, and permission was sought to proceed. Superintendent and principal approval were granted via email communications. School board approval was not required.

A meeting was then held with each of the grade-level teams. A one-page handout outlining the key elements of the proposed study and the expected teacher commitment was presented to the teachers. Particular effort was made to assure teachers that a text topic would be chosen to align with their curriculum and standards, and they were invited to suggest topics. It was agreed that over the following two months, text and measures would be created and teachers would be contacted to coordinate data collection in November or December. Additionally, they were assured that at the conclusion of the experiment all study materials would be provided to them for future use and that the researcher would return in the spring with results of the experiment.

Approval was obtained for this study (IRB#20897) from the university's Office of Research Protections such that parents' passive assent was required as was teacher consent. In advance of the study, students were given a parent letter with opt-out form to take home. The letter described the study and invited parents to decline to allow their child to participate. Only children whose parents returned a signed opt-out form were excluded. Five parents declined to have their child participate. Of the five, four students had IEPs, which disqualified their data from inclusion regardless of parents' request. Teachers signed consent forms on the first day of data collection. (See Appendix A for ORP-approved recruitment and consent forms.)

The instructional manipulation tested in this study was designed for independent readers. Non-independent readers were defined as those with Individualized Education Plans (IEPs). In consultation with the teachers and the school district's special education director, 23 non-

independent readers were identified. On the teachers' recommendation, 5th grade IEP students worked with the study materials in their learning support classroom; while 6th grade IEP students participated in the experiment with their classmates. Like their classmates, all of these students engaged with the study materials, but data their data were not retained for analysis.

A power analysis was conducted to determine optimal sample size for the study. The total estimated sample size recommended by G*Power3 (Faul, Erdfelder, Lang, & Buchner, 2007) was 128 participants. The final sample size (n=146) was, thus, deemed appropriate for the study.

Experimental Text

An experimental text on the topic the Wright Brothers was designed to meet five criteria. The resultant text (1) was written on a topic that fit within the curriculum scope of the fifth and sixth grade Social Studies courses; (2) addressed a topic to which students were expected to have had only minimal pre-exposure; (3) was characterized as informational; (4) represented a typical and naturally-occurring text in terms of length and reading ability; and (5) could be read from at least two different perspectives. (See Appendix B.)

The fifth grade Social Sciences curriculum spanned American History to up to 1945; sixth grade encompassed the period 1945 to present. Thus, the Wright brothers' aviation experience fit chronologically within the domain of Social Studies but appeared only briefly in the 5th grade curriculum under the broader topic of inventions. As the Wright Brothers was a topic potentially studied in the fifth grade, teachers at the study site were consulted and existing curriculum materials were examined to ascertain the degree of students' pre-exposure to specific text content. Such a consultation could only provide information about typical curriculum materials and only about students' experiences at school. Still, it was determined that students' pre-exposure to the topic at school was minimal, and that a pretest of students' prior knowledge

of the Wright Brothers would account for any students who may have visited museums, independently read books on the topic, or perhaps even visited Kitty Hawk, NC where the Wrights' test flights occurred.

The text was constructed to be age-appropriate for middle level learners. Juvenile literary resource material, found in the children's section of the local public and university libraries, provided insight into the kind of Wright Brothers content typically covered in books for this age group. One issue of a children's magazine, *Cobblestone*, featured stories about inventions. One of the issue's articles on the topic the Wright Brothers (Weinstein, 2009) provided information that hinted at two clear influences on the brothers' work: birds and bicycles. A subsequent text was constructed for this research with these two subtopics as the two experimental perspectives. One perspective supported that the Wright brothers relied on their knowledge of *Birds* to develop their airplane; the second supported that they relied on their knowledge of *Bicycles* to build their airplane.

One challenge of creating an experimental passage was balancing a longer, more ecologically valid text with expectedly poor reading ability and potential for fatigue on the part of the middle school participants. Thus, the text was divided in half. Each half included general information as well as information related to the Bird perspective and the Bicycle perspective.Dependent measures were also divided and appeared at the end of each of the two text sections.

As the text was crafted, it was calibrated for number of perspective-specific idea units using a computer program called CPIDR 3 (Brown, Snodgrass, & Covington, 2007), a program that automates the determination of propositional idea unit density. For example, after a bird-relevant section was drafted, it was entered into the CPIDR program which, in turn, counted the

number of idea units. Then a bike-relevant section was written to comprise a similar number of idea units. While students' recall of ideas was ultimately determined at the sentence level, the CPIDR program allowed for a relatively systematic method of balancing the number of ideas in each perspective. The resultant text was presented to three independent raters who categorized each sentence as either a Bird segment, a Bicycle segment, or a general segment. Consensus agreement was the determinant of a segment's ultimate perspective classification. Segments were reentered into CPIDR. Table 2 presents a breakdown, by section and perspective, of word count, idea units, and reading level.

In addition to its characterization as perspective-balanced, the text was informational as defined, and described in Chapter 1, by the 2009 NAEP Reading Framework. At 1,004 words in length, it was written at a Flesch-Kinkaid reading level of 4.7 (Flesch, 1948; Kincaid et al., 1975). This represents a level that was within the independent reading ability of the students in the study.

Table 2

Word count, idea count, and reading level by perspective for each text section

	# of words	# of ideas	Reading level
	Section 1		
Bird	164	71	4.7
Bike	166	71	4.2
General	146	64	6.2
Bird/Bike overlap	29	14	4.2
Section 1 Total	505	22	4.9
	Section 2		
Bird	70	33	4.2
Bike	145	65	4.1
General	266	115	4.9
Bird/Bike Overlap	18	9	7.8
Section 2 Total	499	222	4.6

Note. The disparate figures in Section 2 represent a change in segment categorization from initial development to post-development categorization by independent raters. That is, a number of sentences that were written as bird sentences were later categorized as general sentences.

In order to instantiate each desired perspective, instructions for the text varied by experimental condition. Participants in the Bird condition received the following relevance instructions before reading:

> *Wilbur and Orville Wright were two brothers who invented an airplane. Their invention gave humans the experience of flight. Imagine that you are an employee at a large zoo and that you work in the bird exhibit. Your boss has put you in charge of*

making a display, like a poster, to tell zoo visitors how birds helped the Wright Brothers learn to fly. Read the following article about the Wright Brothers in order to learn as much as possible about how birds helped the brothers learn to fly to best create your display.

Participants in the Bicycle condition received the following relevance instructions before reading:

Wilbur and Orville Wright were two brothers who invented an airplane. Their invention gave humans the experience of flight. Imagine that you are an employee at a large museum about transportation and that you work in the bicycle exhibit. Your boss has put you in charge of making a display, like a poster, to tell museum visitors how bicycles helped the Wright Brothers learn to fly. Read the following article about the Wright Brothers in order to learn as much as possible about how bicycles helped the brothers learn to fly to best create your display.

The final set of instructions were for participants assigned a comparison perspective. Readers in this group were instructed to take the perspective of a student, a reasonable default for a school-based reading assignment. Instructions for this group were designed to parallel instructions provided to the two experimental conditions. Thus, readers in the comparison group were instructed to take the perspective of a person, in this case his or her 'student self', then to imagine having to carry out a task from that person's perspective. Participants in the comparison perspective group received the following instructions before reading

Wilbur and Orville Wright were two brothers who invented an airplane. Their invention gave humans the experience of flight. Imagine that your teacher has put you in charge of creating a display, like a poster, to teach visitors to your class about the

Wright Brothers. Read the following article about the Wright Brothers in order to learn as much as possible to best create your display.

Pre-Experiment Measure

Reading ability. Prior to on-site data collection, the school provided participants' raw total scores from the most recent administration of the 4Sight reading exam as a measure of students' reading ability. The 4Sight exam is a psychometrically reliable and valid measure aligned to the Pennsylvania Academic Standards (Pennsylvania Training and Technical Assistance Network, 2010). Published by the Success for All Foundation, the 4Sight reading exam was designed to predict students' proficiency performance on the reading section of the State's required standardized test, the Pennsylvania System of School Assessment (PSSA) exam. As such, the school district administers the exam in October each year to obtain a diagnostic baseline measure prior to the April administration of the PSSA.

The school district's reading proficiency rate, based on the State's standardized test, places it above the state average (69.8%) at 74.9% in 2008. In 2008, 75.8% of the now-fifth grade class was proficient in reading, while 61.0% of the now-sixth grade class rated proficient the same year (Standard & Poor, 2009). While the district's reading scores typically exceed the state average, they follow the national trend that finds a decline or flattening of scores after fourth grade. Yet unlike the national trend, scores begin to rise again in seventh grade until by eleventh grade they are well above the state average.

Pre-reading Measures (Day 1 Data Collection)

Following a brief introduction to the study, participants were provided demographic information and completed measures of topic interest, topic knowledge, and beliefs. (Pre-reading measures are provided in Appendix C.)

Demographics. Demographic information was obtained for the district as a whole from Standard and Poor (2009). In addition, participants provided their gender and their Social Studies teacher's name and class. This information was recorded on a research study identification card that was made available to students on both data collection days so they could code their responses with a randomly generated number. Demographic data were collected and aggregated only to describe the sample.

Topic interest. The study employed two measures of interest, one to measure topic or individual interest prior to reading, and a second to measure situational interest after reading. As a type of individual interest, topic interest has been defined as a type of interest that remains relatively stable over time and that reflects an individual's preference for certain topics or activities (e.g., Ainley, 2002; Alexander, 2003; Hidi, 1990). Prereading topic interest was initially measured by seven items designed as 6-point semantic differentials (Osgood, Suci, & Tannenbaum, 1957) that required participants to indicate their interest preference between pairs of topics. Directions to the measure read: *For items 1-7, you will see pairs of topics. Color the circle at the place on the line that indicates how much more interested you are in one topic than another.* Items included, for example, ratings between Social Studies and Math, birds and bicycles, writing a story and making a poster. While one item served as a distracter, the other six represented topics that related to either the text, academic domains where the text might logically be encountered, or to the content of the instantiation prompt.

The nature of the items as semantic differentials did not allow for meaningful comparison across the items. An approach was taken such that the two items most closely related to the content of the study were combined into a scale. The two items were those that asked participants to rate their relative interest in *Birds* and *Bicycles* and *Watching Birds* and *Fixing*

Bicycles. Points along the scale were reassigned values ranging from 1 to 6. Bird-related anchors were assigned a '6' and Bike-related anchors were assigned a '1.' Internal consistency reliabilities for the two-item scales were α=.73 and α=.70 for grades five and six, respectively.

Topic knowledge. Twenty-three multiple choice items comprised a topic-specific knowledge test that was presented as a single measure included among packet materials at pretest. Fifteen items were designed as lower-level comprehension, while eight items targeted participants' higher-level comprehension. An example of a lower-level item was *One of the brothers' early glider designs was modeled after (a) an inflated tire, (b) a flat bird wing, (c) a small bird, (d) a crushed box.* An example of a higher-level item was *The mode of transportation that can best help you to measure wind resistance is (a) a scooter, (b) a hot air balloon, (c) a tractor, (d) a speed boat.* Content limitations precluded development of a larger number of higher level items.

An initial 23 items were piloted on a convenience sample of 5th graders (n=7) to determine how much the typical fifth grader knows about the text content in advance of reading the passage and to determine whether correct responses to conceptual items could be intuitively deduced given the distracters. Without reading the text, the children provided responses to the items. Scores of the seven children ranged from 5 to 10 items correct out of the 23 possible, an indication of low pre-existing text-specific topic knowledge. Of the items that were answered correctly, four were answered correctly by four or more of the students. An examination of these items suggested that the apparent ease of three of the items was a function of distracters more than of item content and adjustments were made. One declarative item was correctly answered by all but one student. This item was replaced with a new item.

In a second pilot conducted at a local private school with fifth and sixth graders in their Social Studies class, the text and revised measures were presented in three sections. Scale reliability for the overall measure on the small sample (n=10) was α=.68. Means for each item ranged from .30 to 1.00. The primary change that occurred as a result of the second pilot was the decision to reduce the overall text length and divide it into two sections instead of the three sections that were piloted. In a candid debriefing discussion following this pilot, the students were very clear that they would recommend a two-section text instead of three.

Following data collection with the experimental sample, it was discovered that one of the items had two plausible answers. That is, there was technically only one correct answer, but it could not be discerned from the text passage. As the text was written, participants could have selected either of two reasonable answers. The item was eliminated, and a 22-item measure was retained.

Beliefs. Like topic interest, topic beliefs were measured by two 6-point semantic differentials (Osgood et al., 1957) that required participants to indicate the degree to which they believed one statement versus another statement about the text content. The following directions were provided: *You will see pairs of topics and a question that asks you what you think about the pair. Color the circle at the place on the line that indicates what you think about the two topics.* For example, participants were provided a statement stem, *Which of these do you think had the greatest effect on the invention of the airplane?* Given a pair of possible responses to the question (i.e., *knowledge about birds* or *knowledge about bicycles*) situated at two extremes on the 6-point scale, participants indicated the degree to which they believed one response more than the other. One item was analyzed; the other served as a distracter. Like the topic interest

items, points along the belief scale were reassigned values ranging from 1 to 6. The Bird-related anchor was assigned a '6' and the Bike-related anchor was assigned a '1.'

Post-reading Measures (Day 2 Data Collection)

On the second day of data collection, students were randomly assigned to perspective condition. Following their reading of each of the two sections of the experimental text, students were first given a maze to serve as a distracter task to clear working memory of text content. After the maze, they then completed a measure of free recall and a topic knowledge posttest on content contained within that portion of the text passage. To capture participants' interest in the combined text sections, a situational interest measure was completed once students read the full passage. Post-reading beliefs were also measured only after students read the entire passage. (Post-reading measures are provided in Appendix D.)

Free recall. Participants were directed to recall all that they could remember from their reading of the text section. A test of free recall is typically considered to be a less objective measure than others such as multiple choice tests (Dochy et al., 1999). However, some objective measures of topic knowledge fail to sufficiently capture the structure of students' knowledge (Vallencia, Stallman, Commeyras, Pearson, & Hartman, 1991). For that reason, free recall was chosen to give participants an opportunity to provide all the information they could recall from the text as well as to provide responses to the multiple choice recognition items. Measures of free recall have been used in other perspective studies as well (e.g., Anderson et al., 1983; Kaakinen & Hyönä; 2005; Schraw & Dennison, 1994). Instructions for the free recall measure read as follows:

You have just read part of a story about the Wright Brothers. In the space below, please write down <u>everything</u> you can remember from the passage. If you can't remember exact wording, you can write words or phrases. You may use the back of the page if you need more space.

Topic knowledge. A topic knowledge posttest followed the free recall measure. It was comprised of the same items that appeared on the pretest but items were presented in a different order. Nine declarative items and four conceptual items comprised Part I of the posttest. Five declarative and four conceptual items appeared after Part II. Overall scale reliability for the 22-item multiple choice posttest was α=.71 for Grade 5 and α=.72 for Grade 6.

Situational interest. The post-reading measure of situational interest was the Perceived Interest Questionnaire (Schraw et al., 1995), a 10-item, 5-point Likert-type rating scale with anchors at 1=Low Agreement and 5=High Agreement. As the original measure was designed for older learners, item wording was changed slightly for the middle school sample. For example, item seven from the original measure read *The text was personally relevant to me.* The item was changed for middle school students to read *The text meant something to me.* Internal consistency reliabilities for the 10-item scale in the current study with middle school students was α=.90 and α=.91 for grades 5 and 6, respectively. These reliability coefficients are commensurate with those typically demonstrated on this measure when used with adults.

Other perspective studies have included measures of interest (e.g., Schraw & Dennison, 1994) and some have specifically employed the PIQ (Ramsay & Sperling, 2010). Ideally, a measure of situational interest should be administered immediately following the reading. As described previously, to prevent reading fatigue the text passage was split into two sections. For

the perceived interest measure, however, participants provided ratings for the full text by completing the PIQ only once they completed both text sections.

Beliefs. Topic beliefs were presented the same at posttest as they were at pretest.

Procedure

Data collection was conducted by the primary investigator and two graduate students. Appendix E contains the data collection protocols employed to minimize threats to internal validity (Campbell & Stanley, 1963). Data collection occurred over two days separated by approximately one week. Data were collected from participants during their Social Studies classes. Within each class, students were randomly assigned to conditions. Packets of research materials were prepared in advance with the materials for the three conditions alternated on the second day to allow for random assignment upon distribution within each classroom. Students were provided an identification number for use throughout the study. They were also identified by teacher, in the event that classroom-level analyses were warranted.

The first day, the study was introduced and demographic data were collected as well as students' prereading responses to measures of topic interest, topic knowledge, and beliefs. The protocol for the first day allowed the researchers to pace students' completion of the measures. Example items were completed together then participants answered the items that followed. In all, data collection for Day 1 took approximately 30-40 minutes per class. Students were thanked for their participation and reminded that the researchers would return the following week.

The second day of data collection focused on the text reading and posttests which included measures of free recall, topic knowledge, situational interest, and beliefs. Students were reminded of the research study and of their participation in it using a script read by the researcher and assistants. Materials on Day 2 were self-paced. Some students finished within 30 minutes,

while others took a full class period to complete the measures. Some students were observed struggling with the free recall task. They were encouraged to brainstorm and not to feel they needed to write complete sentences; phrases or a bulleted list were acceptable. On one of the two days of data collection, twelve students provided responses up to a point after which they provided no more data. The level of missing data was sufficient to qualify these students' responses for exclusion from the final data set.

Chapter 4

Results

Participants at both grade levels completed the same measures. However, the fact that students' reading scores were based upon two different 4Sight tests precluded a collapse of the data into one dataset for combined analysis across the grade levels. Thus, separate analyses were conducted for each grade level.

Initial dependent t-tests indicated statistically significant pre-reading to post-reading knowledge gains for participants at both grade levels (Grade 5 (n=72), t(71)=-12.02, p<.001, 95% CI [-6.16, -4.40]; Grade 6 (n=74), t(73)=-16.41, p<.001, 95% CI [-8.13, -6.37]). This is important as it indicates that students learned from the text. Across perspective conditions, and regardless of whether students were assigned a perspective, learning occurred as a result of reading the text. A series of multivariate tests was conducted to address specific hypotheses.

Preliminary Analysis

Descriptive statistics for pre-reading measures are presented in Table 3. At grade 5, score distributions for both reading ability and prior knowledge were approximately normal. The distribution of scores for the topic interest measure was platykurtic. Given the nature of the topic interest measure's semantic differential items, this kurtosis was indicative of a relatively even distribution of responses across the range of interest ratings between birds and bicycles. The pre-reading belief question resulted in a negatively skewed distribution indicating participants' belief that bird knowledge played a greater role in the invention of the airplane than bicycle knowledge.

At grade 6, the score distribution for reading ability was negatively skewed, with more scores at the higher end of the distribution. The distribution for prior knowledge was approximately normal. Unlike the 5th grade distribution of topic interest scores, the grade 6

distribution was positively skewed, indicating that 6th grade students tended to be more interested in birds than in bikes. Finally, as in 5th grade, the pre-reading belief question resulted in a negatively skewed distribution indicating participants' belief that bird knowledge played a greater role in the invention of the airplane than bicycle knowledge.

Table 3

Descriptive statistics for pre- and post-reading measures

	Grade 5				Grade 6			
	Bird (*n*=26)	Bike (*n*=24)	Control (*n*=22)	Overall (*n*=72)	Bird (*n*=27)	Bike (*n*=23)	Control (*n*=24)	Overall (*n*=74)
Pre-Reading Measures								
Reading ability	18.52 (3.76)	17.75 (4.15)	18.59 (4.57)	18.28 (4.11)	23.46 (4.18)	22.67 (4.02)	23.23 (3.62)	23.14 (3.91)
Topic Interest	7.31 (3.52)	5.96 (3.72)	6.18 (3.39)	6.51 (3.55)	5.70 (3.36)	5.57 (3.01)	5.13 (3.00)	5.47 (3.11)
Topic knowledge	6.88 (1.66)	6.58 (1.56)	6.56 (2.24)	6.68 (1.80)	7.44 (2.00)	7.65 (1.40)	6.71 (1.88)	7.27 (1.81)
Belief	4.35 (1.57)	5.46 (1.14)	4.91 (1.54)	4.89 (1.49)	5.44 (0.89)	4.78 (1.62)	5.21 (1.35)	5.16 (1.31)
Post-Reading Measures								
Free recall	7.23 (5.01)	6.92 (4.80)	7.73 (5.07)	7.28 (4.90)	10.85 (6.19)	8.61 (3.12)	9.67 (4.19)	9.77 (4.79)
Topic knowledge	12.20 (3.90)	11.75 (4.07)	11.93 (3.90)	11.97 (3.90)	14.99 (4.18)	13.94 (3.83)	14.54 (3.24)	14.52 (3.76)
Situational interest	27.19 (7.93)	31.20 (9.95)	33.11 (8.69)	30.33 (9.10)	31.04 (7.93)	27.91 (9.11)	25.33 (8.02)	28.22 (8.57)
Belief	4.00 (1.83)	4.38 (1.69)	4.68 (1.70)	4.33 (1.74)	4.04 (1.34)	3.74 (1.54)	4.33 (1.61)	4.04 (1.49)

Means and standard deviations for post-reading variables are reported in Table 3. Visual inspection of the histograms and examination of skewness and kurtosis statistics for the four post-reading variables indicated approximately normal distributions for the multiple choice recognition post-test at both grade levels. At both fifth and sixth grades the distributions of total recall scores were positively skewed and leptokurtic, representing overall low recall and many scores around the relatively low mean of 7.28. Distributions of perceived interest scores were approximately normal for both grade levels.

Compared to belief scores at pre-reading, post-reading belief scores dropped in all three conditions at both grade levels. While not statistically significant, these decreases suggest movement along the differential scale from the belief that knowledge of birds was more influential in the invention of the airplane toward the belief that knowledge of bicycles was more influential. Moreover, like the pre-belief measure, the distribution of post-belief scores was negatively skewed. Given the item's semantic differential nature, the skew indicated that, even at post-reading participants still believed that knowledge of birds was more influential in the invention of the airplane than knowledge of bicycles.

Preliminary analyses addressed whether there were differences in reading ability or topic knowledge among perspective conditions prior to reading. Due to random assignment, it was hypothesized that there would be no differences across conditions in reading ability or prior knowledge. It was expected that many students, by the end of the primary grades, would have a cursory knowledge of the Wright Brothers. Yet, teacher input during text development suggested students had only minimal exposure to the text topic in their fifth grade Social Studies class. Thus, some sixth graders may have been briefly exposed to the topic during an inventions unit late in their fifth grade year. It was expected, therefore, that sixth graders may post slightly

higher scores than fifth graders; and descriptively, they did. Of relevance in the current analyses, however, was a determination that there were no differences among perspective conditions *within* each grade level.

For each grade level, a multivariate analysis of variance (MANOVA) test was conducted with perspective condition entered as the fixed factor and reading ability and prior topic knowledge entered as the dependent variables. For grade 5, results indicated no differences among perspective conditions in reading ability [$F(2,69)=.30$, $p=.74$, $\eta_p^2=.01$] or prior knowledge of Wright Brothers content [$F(2,69)=.25$, $p=.78$, $\eta_p^2=.01$]. Similarly, for sixth grade there was no difference across perspective conditions in reading ability [$F(2,71)=.26$, $p=.78$, $\eta_p^2=.01$] or prior knowledge [$F(2, 71)=1.82$, $p=.17$, $\eta_p^2=.05$]. These findings support that there were not differences on reading ability or prior topic knowledge within each grade level. Analyses followed to address specific hypotheses.

The focus of the current research was to determine whether *a priori* perspective assignment makes a difference in students' comprehension. To address this overarching question, the first series of analyses considered the effect of perspective versus no perspective as well as examined the effect of *each* perspective on students' overall comprehension. A second question addressed whether perspective assignment made a difference in comprehension of perspective-relevant text.

Does Reading from a Perspective Make a Difference in Learners' Overall Comprehension?

As described in Chapter 2, numerous previous studies demonstrated that perspective instantiation provided benefit to college age and adult readers on post-reading measures of total recall, topic knowledge, and perceived interest. Thus, it was first hypothesized that results would be similar in younger students tested in an authentic setting and that students who read from a

perspective would outperform those not assigned a perspective. For each grade level, data were submitted to a MANOVA test. Perspective condition was entered as the fixed factor; dependent variables were post-reading recall, topic knowledge, and perceived interest. The multivariate test was examined as were pairwise comparisons and planned univariate follow-up tests to explore relative differences among the three conditions.

Effect of perspective assignment versus no perspective assignment. It was first queried whether there was a difference in recall, topic knowledge, or perceived interest for learners assigned a perspective compared with those not assigned a perspective. It was hypothesized that participants in perspective conditions, regardless of the specific perspective assigned, would post higher scores on outcome measures than participants not assigned a perspective. Post hoc pairwise tests with Bonferroni adjustment for multiple comparisons were calculated (M_d=Perspective$_{\text{Birds or Bikes}}$ - Comparison).

Grade 5. Tests of pairwise comparisons indicated no statistically significant differences between either of the perspective conditions and the comparison group on total recall (Birds: M_d= -.50, p=1.00; Bikes: M_d= -.81, p=1.00); topic knowledge (Birds: M_d= .28, p=1.00; Bikes: M_d= -.18, p=1.00); or perceived interest (Birds: M_d= -5.91, p=.07; Bikes: M_d= -1.91, p=1.00).

Grade 6. Similarly for 6th grade, tests of pairwise comparisons indicated no statistically significant differences between either of the perspective conditions and the comparison group on total recall (Birds: M_d= 1.19, p=1.00; Bikes: M_d= -1.06, p=1.00) or topic knowledge (Birds: M_d= .45, p=1.00; Bikes: M_d= -.61, p=1.00). On the perceived interest measure, there was no significant difference between the Bike group and the comparison group (M_d= 2.58; p=.88), but there was a statistically significant difference between the Bird group and the comparison group (M_d= 5.70; p=.05).

Effect of each perspective. The second analysis tested the differential effect of perspective condition (Bird, Bicycle, Comparison) on the major outcome variables of total recall, topic knowledge, and perceived interest.

Grade 5. For the multivariate omnibus test, Box's test of homogeneity of the variance-covariance matrix was non-significant, p=.91; therefore, the Wilks' Lamba statistic was interpreted. There was no significant main effect for the manipulation of perspective on comprehension measures and interest at an alpha of .05, Wilks' Λ=.91, F(6, 134)=1.03, p=.41, η_p^2=.04.

Between-subjects effects were examined to better determine the relative influence of perspective condition on observed variability among the three measures. There were no statistically significant univariate main effects of perspective assignment on total recall [F(2, 69)=.16, p=.86, η_p^2=.00], topic knowledge [F(2, 69)=.09, p=.92, η_p^2=.00], or perceived interest [F(2, 69)=2.82, p=.07, η_p^2=.08].

Grade 6. For the multivariate omnibus test, Box's test of homogeneity of the variance-covariance matrix was non-significant, p=.20; again, the Wilks' Lamba statistic was interpreted. There was no significant main effect for the manipulation of perspective on comprehension measures and interest at an alpha of .05, Wilks' Λ=.89, F(6, 138)=1.34, p=.24, η_p^2=.06.

Between-subjects effects were examined to better determine the relative influence of perspective condition on observed variability among the three measures. As with the fifth grade results, there were no statistically significant univariate main effects of perspective assignment on total recall [F(2, 71)=1.38, p=.26, η_p^2=.04], topic knowledge [F(2, 71)=.48, p=.62, η_p^2=.01], or perceived interest [F(2,71)=2.99, p=.06, η_p^2=.08].

Does Perspective Assignment Make a Difference in Learners' Comprehension of Perspective-Relevant Text?

The final set of analyses addressed the hypothesis that students assigned a specific perspective would comprehend more perspective-relevant text than those who read from the alternative perspective and those in the comparison group. Perspective-relevant recall is represented in Table 4 by mean frequency counts for each perspective condition. Perspective-relevant knowledge was measured by specific items on the multiple choice recognition test. Pre- and post-test means and standard deviations for topic knowledge by perspective and grade are presented in Table 5. Low internal consistency reliability coefficients on perspective-relevant subscales precluded inferential testing. However, descriptive data reveal some interesting trends.

Table 4

Means and standard deviations for recall frequencies by perspective and grade

Grade 5			
	Birds (*n*=26)	Bikes (*n*=24)	Comparison (*n*=22)
Bird Recall	0.88 (1.14)	1.46 (1.72)	1.82 (2.08)
Bike Recall	2.04 (1.84)	1.54 (2.43)	1.95 (1.46)
General Recall	4.31 (3.11)	3.88 (2.21)	3.95 (2.59)
Grade 6			
	Birds (*n*=27)	Bikes (*n*=23)	Comparison (*n*=24)
Bird Recall	2.63 (2.02)	1.96 (1.69)	2.13 (1.48)
Bike Recall	3.22 (2.31)	1.96 (1.33)	2.38 (1.53)
General Recall	4.89 (3.31)	4.65 (2.14)	5.13 (2.29)

Table 5

Pre- and post-test means and standard deviations for topic knowledge by perspective and grade

Grade 5						
	Birds (*n*=26)		Bikes (*n*=24)		Comparison (*n*=22)	
	Pre	Post	Pre	Post	Pre	Post
Bird knowledge	3.27 (1.15)	4.07 (1.60)	3.13 (1.26)	4.25 (1.55)	2.87 (1.33)	3.64 (1.65)
Bike knowledge	2.38 (1.20)	3.73 (1.00)	2.33 (.92)	3.29 (0.95)	2.73 (1.45)	3.61 (1.08)
General knowledge	1.23 (.95)	3.25 (1.46)	1.13 (.80)	3.04 (1.37)	.95 (.91)	3.20 (1.32)
Grade 6						
	Birds (*n*=27)		Bikes (*n*=23)		Comparison (*n*=24)	
	Pre	Post	Pre	Post	Pre	Post
Bird knowledge	3.63 (1.11)	5.00 (1.94)	3.48 (.85)	4.76 (1.44)	2.92 (1.18)	4.88 (1.57)
Bike knowledge	2.70 (1.14)	3.81 (1.11)	2.61 (.99)	3.87 (1.58)	2.71 (1.27)	3.67 (1.13)
General knowledge	1.11 (.89)	3.78 (1.15)	1.57 (.95)	3.83 (1.07)	1.08 (.72)	3.75 (0.85)

Grade 5. As described in Chapter 3, independent raters categorized each segment of the text as either a bird segment (*n*=32), a bike segment (*n*=33), or a general segment (*n*=40). While the total number of segments in each perspective was similar, the totals were not identical. Thus, the proportion scores were important as well. When proportion scores were considered, descriptive data indicated that the Bird condition recalled the *smallest* proportion of bird segments (*M*=.03, SD=.04); and the comparison condition recalled the greatest (*M*=.07, SD=.08). There was little descriptive difference in proportions of bike and general segments recalled across conditions.

It was hypothesized that students who read from a perspective would perform better on topic knowledge recognition items related to their own perspective than would students who read from the alternate perspective or from the comparison perspective. Findings in Grade 5 indicated a result counter to this hypothesis. That is, the Bike condition outperformed both the Bird and comparison conditions on *bird* knowledge; and the Bird condition outperformed both the Bike and comparison conditions on *bike* knowledge.

Grade 6. The Bird condition posted the highest proportion scores for recall of Bird-relevant and Bike-relevant segments (*M*=.10, SD=.07 for both). The comparison group recalled the greatest proportion of general segments (*M*=.12, SD=.06). Unlike the trends in Grade 5, mean performance on the topic knowledge measure among 6th grade participants was in the expected direction. That is, the Bird condition outscored both the Bike and comparison conditions on bird knowledge; and the Bike condition outscored both the Bird and comparison conditions on bike knowledge.

Across grade levels the 6th grade participants performed better than the 5th grade participants, with higher scores in every cell. Moreover, fifth and sixth graders also recalled the

highest proportions of content when it was general information rather than information relevant to birds or bicycles. Finally, at both grade levels, students performed best on items relevant to the Bird perspective.

Chapter 5

Discussion

The purpose of the current study was to examine whether instantiation of a perspective prior to reading a long, ecologically-valid informational text would improve fifth and sixth grade learners' recall and recognition of the text content. Results indicated that perspective, as it was experimentally instantiated in a middle school setting, did not yield statistically significant results on students' comprehension overall or on perspective-relevant content. The study, nonetheless, contributes meaningfully to the literatures on relevance and perspective instantiation as it employed a newly-constructed long and perspective-balanced expository text, a text-type not previously employed in perspective studies. Moreover, the results establish an important baseline for exploring the effectiveness of perspective instantiation in middle school populations.

The study participants posted generally poor scores on the topic knowledge pretest . The overall mean out of a possible 22 points was only 6.68 (1.80) for Grade 5 participants and 7.27 (1.82) for Grade 6. The low pretest scores serve as important contextual reminders that students in classrooms often know little about the content of their courses prior to reading and instruction. Statistically significant higher scores at post-test, regardless of condition, are also reminders that students learned from reading.

The current study set out to determine whether learners as young as fifth grade, the grade at which standardized reading scores tend to slump (Chall & Jacobs, 2003; Lee et al., 2007), could benefit from an instructional approach that manipulates reading perspective. Findings indicated that, regardless of whether perspective was examined relative to overall measures or to perspective-relevant content, the manipulation did not provide such benefit. A return to the

interplay among learner, text, and task (Reynolds, 1992) allows for speculation on why the effect of perspective instantiation on middle school learners' comprehension is yet inconclusive.

Learner

Prior to the current study, the effect of perspective instantiation on reading comprehension had not been tested in middle grades learners. Typically, it was young adults who were participants in such studies (e.g., Ramsay & Sperling, 2010; Schraw & Dennison, 1994). Thus, it was unclear, even at the outset of the experiment, what influence assigning an *a priori* perspective would have on these students' recall and recognition scores. Findings indicated there was no significant effect of perspective instantiation on either measure of reader comprehension. Possible explanations for this general result include those related to students' transition to middle school, their prior knowledge of birds and bicycles, and to perspective as seductive detail or distraction rather than as benefit.

Transition to middle school. Perspective instantiation has previously demonstrated benefit for independent readers. Aligned with this prior research, the current study was designed for independent readers. It is often assumed that middle school students can already read (e.g., Blanton et al., 2007). Yet even by sixth grade, students are still transitioning from elementary school where they were learning to read to middle school where reading is but one tool leveraged in the pursuit of new learning. Thus, the fifth and sixth grade participants in this study were still early in their development as independent readers. As described in Chapter 3, data from students who were not considered to be independent readers were excluded from the study. Nonetheless, there may have been other students who did not receive special education services but who were challenged to read independently. If students were not able to read the text, a text for which

participants were randomly assigned to read a text-based prompt, then the perspective would clearly not have had its desired effect.

Prior knowledge of bicycles and birds. Learners' prior knowledge of text-specific content was assessed before and after reading. The pretest was important for ensuring that there were no differences in knowledge of text content across conditions prior to reading the text. Further, the combination of pre- and posttest allowed for the determination that students learned from the reading. However, learners' general knowledge of bicycles and birds was not assessed. It may be that such knowledge is necessary for a reader to adequately take a perspective. For example, a learner lacking 'real' knowledge of bicycles may find it difficult to assume a bicycle perspective. In the current study, learners lower in perspective-relevant prior knowledge may not have known about bikes or birds in ways that were helpful to taking their assigned perspective.

Perspective as seductive detail or distraction. Finally, it was hypothesized that reading from a perspective, regardless of which perspective, would result in higher comprehension scores than reading without a perspective. This did not prove to be the case. One possibility is that perspective instantiation functioned as a seductive detail. Seductive details are text information that is entertaining or interesting but relatively unimportant or irrelevant to the main idea (e.g., Garner, Gillingham, & White, 1989; Harp & Mayer, 1997). Numerous studies have demonstrated that seductive details can impede comprehension of important ideas. Among them, for example, Lehman, Schraw, McCrudden, and Hartley (2007) found this result when employing a technical expository text about lightning. If perspective instantiation functioned as a seductive detail in the current study, we would expect participants in the comparison group to outperform those in the perspective groups, since the instantiated perspective would distract

readers away from main ideas of the passage. There was, however, no pattern in this direction either statistically or descriptively.

In contrast to the Lehman et al. (2007) study, two other studies employed texts that were expository in nature but that could be characterized as more narrative than technical, and the result was different (Garner & Gillingham, 1991; Schraw, 1998). In these two studies, one employing a text about physicist Stephen Hawking (Garner and Gillingham) and one about British Vice Admiral Horatio Nelson (Schraw, 1998, Experiment 3), seductive details did not disrupt comprehension. The Wright Brothers text employed in the current study was a similarly expository text with narrative and biographical characteristics. So speculation about the possibility of perspective as seductive detail may be of limited value.

Perhaps a more viable explanation is simply that the demands of the task may have distracted learner attention away from important content overall or perspective-relevant content. Working memory limitations may have challenged students to read from a perspective and focus on perspective-relevant information. Reminding learners of their assigned perspective as they read may have alleviated such a distraction.

Text

In addition, learners may have found it difficult to attend for the duration of the longer expository text. Children's first exposure to reading is generally to short narrative stories. In the current study, the experimental text was 1,004 words long. Students may have found it difficult to attend to such a lengthy text. The deliberate, fatigue-reducing effort to break the reading task into two parts, each of which was followed by multiple measures of comprehension, may still have been too cognitively demanding for students. As noted in Chapter 4, some students' data

were eliminated because they were unable to complete the task in the time permitted, or they elected to return it without completing all parts.

Task

Double instantiation. The specific, and differential, reading task was described to students via relevance instructions. The written directions for how participants were to read the text served as the prompt to instantiate either the Bird perspective, the Bike perspective, or the comparison perspective. The instructions required students to represent *two* new perspectives in their mind: one in which they assumed the perspective of an employee (zoo exhibit employee, museum exhibit employee, or student) and a second such that students had to imagine they were required to carry out a specific task as part of their 'job.' Essentially a *double instantiation*, the task required that students not only assume a novel perspective but also imagine carrying out a task as if they were a person from that actual perspective.

It is unclear whether students were able to take these perspectives. The first aspect of their perspective assignment required them to imagine being an employee at a zoo or a museum or a student at school. For young learners 11 or 12 years old, imagining they are an employee *anywhere* may have been difficult, as they have never been one. Although a deliberate attempt was made to focus on types of work that students in middle school could imagine (i.e., zoo work, museum work, school work), formal employment as described in the prompt of each of the conditions may have been too far removed from the learners' experience. It is likely that the easiest perspective to assume is the one they live out daily—that of a student. This may explain why, at least descriptively, the comparison group outperformed participants in perspective groups on a number of post-reading measures. For those who could adequately represent a perspective in their mind, the additional challenge of imagining they had to undertake a specific

task from that perspective (i.e., design a display like a poster) may have exceeded their capacity to maintain the perspective as they read.

Attention and interest. Learner attention and interest may have played a role as well. It was theorized that readers would allocate more attention to perspective-relevant text. For effects of perspective instantiation to emerge, therefore, participants needed to 'hold' the perspective as they read the more than 1,000-word text. This notion of hold mirrors Mitchell's (1993) work on the role of interest in various activities employed in Mathematics classrooms. In his theoretical model, Mitchell differentiated between *catch* and *hold* processes; that is, some classroom activities effectively catch students' interest, while others function to hold it for a period of time. It is possible that there is a similar effect when a perspective is assigned. While the prompt may function to catch the reader or instantiate a perspective at the beginning of a reading experience, other mechanisms may be necessary for the reader to hold or maintain the perspective for the duration of their reading. How long a middle school learner can hold a perspective, and what supports may benefit longer-term perspective maintenance, are areas ripe for future research.

Strengths

Previous research on relevance and perspective instantiation has contributed to a general understanding of the importance of helping learners attend to relevant text content and of manipulating reading instructions as a means to that end. The learners in these studies, however, have been college age and adult learners tested in carefully controlled experimental settings. The current study makes important contributions related to measurement of perceived interest and to text development that help extend the research literature into the middle grades. In fact, the study represents an important starting point for exploring what perspective instantiation might look like in authentic school-based settings with a longer, more authentic domain-specific text.

Perceived Interest Questionnaire. An important outcome related to situational interest was the performance of the Perceived Interest Questionnaire (Schraw et al., 1995) as it was employed with middle grades students. Prior to the current study, the PIQ had not been administered to middle level readers. While it has yielded high internal consistency coefficients (i.e., typically > .90) in previous research with college students, it was unknown how it would perform with fifth and sixth grade students. As noted in Chapter 3, minor adjustments were made to the PIQ to make the measure more age-appropriate for use in the current study. Internal consistency reliability coefficients at both grade levels were still high at $\alpha \geq .90$. Thus the PIQ, with only minor changes in item wording, proved to be a reliable measure of middle school students' situational interest following their reading of a long informational text. Future research in middle school populations should test the viability of this revised PIQ with other types of text materials.

Experimental text. Perhaps the greatest contribution stemming from this work is the development of the carefully calibrated perspective-balanced text. With such a text, additional research can be conducted in similar middle level settings. A text is now available for use by researchers who want to explore perspective instantiation with learners in grades four through eight.

While these important contributions must be noted, there were a number of limitations to this study that must also be acknowledged. These are related to sample, measures, and experimental context.

Limitations

Sample. The first limitation of the study was sample size. In spite of an *a priori* power analysis, there was low observed power in numerous analyses. This was not surprising once it

was determined that the grade levels needed to be analyzed separately. More participants in each of the three conditions would have increased the power to detect differences. Still, the need to divide the data into grade level groups was both a strength and a limitation. First, analyzing the grade level data separately revealed interesting differences, even if only descriptive, particularly relative to perspective-relevant recall. Unfortunately, splitting the data set also substantially reduced the power of the statistical tests that were conducted.

Measures. The length of the experimental text constrained topic knowledge item development. A mix of higher- and lower-level multiple choice recognition items comprised the topic knowledge measure. However, comparisons by level could not be undertaken, as there were simply too few higher-level items to achieve acceptable internal consistency reliability. While the text was long in comparison to other perspective studies, it was generally short and, therefore, limited in testable content.

As described in Chapter 3, the topic interest measure as constructed for this study was problematic. In hindsight, a semantic differential format to capture relative interest between birds and bicycles was not ideal. Only two items on the topic interest measure were ultimately retained for analysis. Semantic differentials, as originally conceptualized (Osgood, 1957), were designed as two bipolar extremes of an adjective pair. They are often used to measure attitudes where the adjective pairs represent the opposite ends of an attitude or emotion spectrum such as happy and sad. As they were utilized in the current study, they were not situated as opposite extremes but rather as different topics on which participants could rate their relative interest. What may have been more useful, and what was developed and used in a follow-up study, was a measure containing more bird and bike items for which participants rated their interest in each topic rather

than relative to one another. A factor analysis on data from the follow-up study will reveal whether the items load on bicycle or bird factors.

Experimental context. A school-based experimental study, while appealing for its ecological validity, also presented a limitation reflected in the level of missing data that resulted. Data were collected over two time points a week apart. Some students were present the first day but not the second or were absent the first day but present on the second. This circumstance resulted in more missing data than if data had been collected all at once. Dividing data collection across two days was appropriate given logistical constraints of the school site. It also allowed for the posttest to be administered a full week after the pretest. Thus, the tradeoff of the data collection schedule was missing data that contributed to a less than optimal sample size.

Another limitation related to the school-based context was students' motivation to participate fully. The school district adheres to a rigorous schedule of standardized testing. As the experimental text and related outcome measures were constructed to mimic a standardized test packet, students' motivation to participate may have been less than optimal. The students' voluntary participation at their teacher's behest may have resulted in low motivation for the task. Future studies should include a measure of motivation to engage in the task.

Future Research

The current study represents an important baseline for exploring the effect of perspective instantiation in middle level learners. Future related research should address older middle school students. Developmentally, one would expect older learners to be more proficient independent readers and more likely to take and hold a perspective. A follow-up study is currently underway with eighth grade students at the same school site.

In addition, future studies should be designed to provide deeper insight into the role of topic beliefs in perspective-taking. Such studies should compare how beliefs effect perspective-taking when learners read a text characterized as high-affect (i.e., one about which readers may hold strong beliefs) compared with low-affect texts. The text employed in the current study would be considered low-affect by all but some history hobbyists. Beliefs may play a different role when the text itself more affective.

Finally, given the demands of the overall task, future studies should scaffold measure completion. For example, to ensure maximum participation and effort on the measure of free recall in the follow-up study, students were shown examples and non-examples of what is an appropriate response to a free recall prompt.

Every year, available information grows exponentially. Thus it is not surprising that students are bombarded with informational texts of all sorts and formats. In school, students often engage with such informational texts in their content area courses. As students in the middle grades continue to struggle with comprehension of informational texts, their content area instructors face the challenge of facilitating students' comprehension. For texts that clearly can be read from multiple perspectives, assigning students to read from one perspective or another may be a way to focus student attention on the most relevant text for the task. This approach has been shown to provide benefit to older learners reading relatively short narrative texts in controlled experiments. It is yet unclear whether the manipulation might benefit middle school students reading longer informational texts in actual classrooms. The current study, however, represents an initial step in addressing this important question.

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Appendix A

ORP-approved Recruitment and Consent Forms

Teacher Informed Consent

Informed Consent Form for Social Science Research
The Pennsylvania State University

Title of Project: Learning from Expository Text

Principal Investigator: Rayne Sperling, Ph.D., Educational Psychology
232 CEDAR Building, University Park, PA 16802
814-863-2261; rsd7@psu.edu

Other Investigator(s): Crystal M. Ramsay, MEd, MS; P. Karen Murphy, PhD

1. **Purpose of the Study:** The purpose of this research study is to understand how students read and study text with different types of diagrams, pictures, instructions, and other aids.

2. **Procedures to be followed:** I would like your students to answer brief demographic questions and work through materials that you present in the class. Materials will be administered as part of your normal lessons through the course of one or several class periods. All the tasks your students will be asked to complete are like those already given in the classroom (reading and answering written test questions). These items are similar to those reading tasks you normally do in classrooms and all materials have been designed to meet with state standards for your grade level. In short, these are quality instructional materials that present content you are normally teaching in your classroom. We are trying to determine the best way to present content with varying instructions to help students understand it best.

3. **Benefits:** The benefits to you include that you will be provided additional instructional materials for use in your classroom. Your students will also benefit from increased exposure to content area content. The materials are well designed and interesting. Materials are much like those the students experience when they take standardized reading tests, so your students will receive some extra practice.

4. **Duration/Time:** We will be using several different materials across multiple grade levels. We expect it will take approximately two class periods to complete the materials. Regardless of the time, we are interested in examining how well learners are able to learn from these materials.

5. **Statement of Confidentiality:** Any data provided by you will be confidential. You should submit your students' work without identifying information. In the event of a publication or presentation resulting from the research, no personally identifiable information will be shared.

6. **Right to Ask Questions:** Please contact Crystal Ramsay at 814-883-5190 or Rayne Sperling at 814-863-2261 with questions or concerns about this study.

7. **Compensation:** There are no costs to you for participation in this research. We will provide all instructional materials. As a benefit to you and your teaching, these materials will also be available

for you to download and store for subsequent use. You do not need to participate in this research to receive copies of the research materials.

8. **Voluntary Participation:** Your decision to be in this research is voluntary. You can stop at any time. You do not have to answer any questions that you do not want to answer.

You must be 18 years or older to participate in this research. You will be given a copy of this signed and dated consent form for your records.

_____	_____
Participant Signature	Date
_____	_____
Person Obtaining Consent	Date

Parent Consent and Opt-Out Form

December 2, 2009

Dear Parent:

Hello, my name is Crystal Ramsay. I am a former Tyrone Area Middle School teacher and am currently a doctoral student at Penn State University. I am working with the middle school on a research study (IRB #20897). The purpose of this research study is to understand how students read and study class materials such as textbooks when teachers provide different purposes for reading. We know that reasons for reading vary and that students learn better when certain types of instructions are given than when others are provided. Since students are often assigned to read from texts in their content area courses, we are working to learn the most relevant purposes and the best types of instructions to give students before they read so that they get the most learning from their reading.

I would like to ask your child to participate in this research study. This would involve your child answering some brief demographic questions and working through some typical social studies materials. I will be administering the materials to your child with the cooperation of the classroom teacher over a couple class periods. All the tasks that your child will be asked to complete are like those already given in the classroom (reading and answering written test questions). In fact, at the conclusion of the study, your child's teacher will be provided these materials for later use with other students in future classes.

This text passage in this study is about inventors, a topic that appears in the social studies curriculum. In addition, the materials are much like those the students experience when they take standardized reading tests, so your child will receive some extra practice. We will ask a few questions in addition to those pertaining to inventors. These include some demographic questions, some questions about your child's interest in different topics, and a few questions about their interest in the social studies content they are reading. We also ask to use their answers to the questions they answer about what they have read to help our understanding of how they are learning from text materials and from different kinds of instructions.

I do not believe there are any risks to your child for participating in this research. I do see several possible benefits, however. Your child will have the opportunity to work with additional social studies materials related to the curriculum. Whenever people read, we read for a purpose. How effectively we accomplish that purpose depends on how effectively we read related materials. Your child will practice such important reading. Your child will also be able to practice reading the same kind of passage he or she will be tested on later this school year.

Your child's participation will remain confidential and no information to identify your family or your child will be made in reports or presentations.

Please feel free to contact me at (814) 441-7133 with any questions you have about this research.

Your decision to have your child participate in this research is voluntary. You can have your child stop at any time. Your child does not have to answer any questions he or she does not want to answer.

If you do **NOT** want your child to participate, please sign and return the form at the bottom of this page to your child's teacher or contact me within 5 days of receiving this letter. If I have not received the bottom form or received a call or email from you by Monday, December 7, your child will be considered able to participate in the research. Again, please only return the form on the bottom of this letter or contact me if you do **NOT** want your child to participate.

Thank you.

Crystal M. Ramsay
Department of Educational and School Psychology and Special Education
The Pennsylvania State University
University Park, PA 16802
(814)441-7133
cmg5@psu.edu

I do **NOT** want my child to participate in the research study.

Childs First and Last Name (please print): _____

Parent or Guardian name: (please print): _____

Signature of Parent Guardian: _____ Date_____

Signature of Researcher: _____ Date_____

Appendix B

Experimental Text

Something amazing happened on a sandy beach at Kitty Hawk, North Carolina in 1903. Wilbur and Orville Wright were brothers. They were on the beach one morning. They had a flying machine they had built themselves. The brothers called their airplane the *Flyer.* Orville Wright took off in the machine. He flew a distance of 120 feet in the air before he landed. This was the first successful airplane flight in the world. The brothers studied bicycles and birds to learn how to build their historic airplane.

Bicycles were a new invention when the Wrights were young men. Most people did not know how to fix bikes when they broke. The Wright brothers were great mechanics. They repaired bikes. Their friends brought bicycles to the brothers for repairs. But the brothers also dreamed of inventing a flying machine.

One day Wilbur was working in their bike shop. He squeezed an empty bicycle tube box flat. He noticed how it looked when he twisted it in his hands. The shape of the crushed box gave him an idea for the plane. They used the idea on one of their early two-winged gliders. The box and the glider they built were the same shape.

Many people had tried to build flying machines. One big problem they faced was keeping the machine steady. The Wrights learned how to control an aircraft in flight by watching how birds fly. They paid attention to how large birds such as seagulls flew. The brothers noticed that the birds twisted the tips of their wings. This kept the birds from being tossed by the wind.

Now Wilbur and Orville could control their plane. But they needed to learn how to make it turn. They thought about how a cyclist turns when riding a bike. The brothers knew that when you want to turn a bike, you must lean. You don't just twist the handlebars. They needed to find a way to make the airplane lean, similar to how a cyclist makes a bicycle lean.

The brothers watched how birds turn too. When a bird turns, its whole body rolls the same way. A pilot must be able to put the plane into a roll. The pilot must also be able to bring the wings back into a horizontal position.

Cyclists lean and birds roll. The Wright brothers believed planes should lean and roll too. This idea made them different from other inventors at the time. Others believed the exact opposite. For them, rolling was dangerous and should be avoided.

Wilbur and Orville worked on a plan to make their plane turn. They invented a process called wing-warping. The wings of a bird are not rigid like a piece of wood. They flap and flex and change their shape. The brothers' plane would need flexible wings too. Wing-warping made it possible for the plane to turn. The brothers also attached a moveable rudder to the back of their plane. Like a bird's tail, the rudder allowed the plane to go up and down.

In their bike shop, the brothers made many of the parts themselves. They used simple tools like a lathe, a drill press, and cutting equipment. They even built a special engine to work the machinery in their shop. The skills they used to repair bicycles helped them to build their flying machine. They used what they knew about how to build machines to help them face the problems of flight.

People around the world were trying to build flying machines. A British inventor named George Cayley had an idea about the wings. He noticed that bird wings are not flat. They are curved. This special shape gives birds lift. It also gives them thrust. Humans cannot use their arms to create both lift and thrust. A machine was needed to do this. A German named Otto

Lilienthal also studied birds to learn how they flew. He believed the wings of a flying machine needed to be shaped like a bird's.

The Wright brothers built a wind tunnel to test some of their ideas for airplane wings. A wind tunnel is a long box, open at one end with a fan at the other. The fan pushes air through the box. Models are placed inside so you can see how they work in a current of air. This tells you how a full-size object will react in real life.

In their wind tunnel, the Wrights compared bird wings and airplane wings. Their wind tunnel was six feet long by two feet across. It had a glass panel at the top. This window allowed Wilbur and Orville to see what was happening inside. The fan blew air through the tunnel at 27 miles per hour. The brothers tested almost two hundred kinds of wings. They were looking for the perfect shape. They needed a shape that would give the most lift and the least drag.

After many test flights at Kitty Hawk, the Wright brothers went home to Dayton. Their work with bicycles gave them more ideas about flight. One day the brothers took turns pedaling one of their own bicycles. They rode as fast as they could down a city street. They had a third wheel on the front of the bike. The wheel was mounted flat on the handlebars. It spun freely. This third wheel had two metal plates on top of it. One plate was flat and the other was curved. They used this to measure wind resistance. This was an important step to building an airplane that would work.

Eventually the Wrights had a flying machine they could control. Orville Wright became the first person to fly in an airplane. It was a mid-December morning. His flight lasted only 12 seconds. But the brothers made more flights that day. The *Flyer* stayed in the air longer each time. They used what they knew about birds and bicycles to create the first successful airplane in the world. Some people called the brothers "The First Heroes of the New Century."

Appendix C

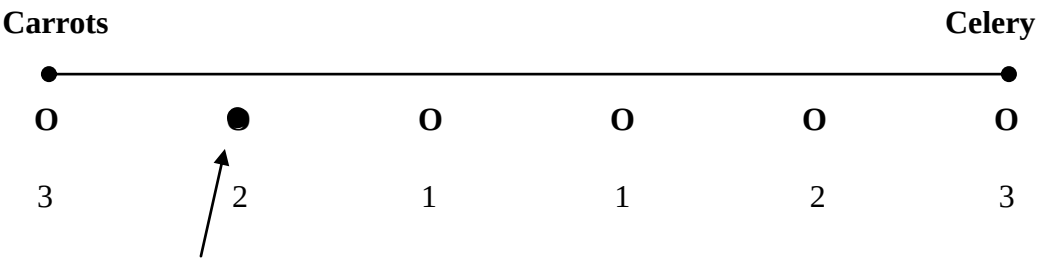
Pre-Reading Measures

Topic Interest

Which is more interesting?

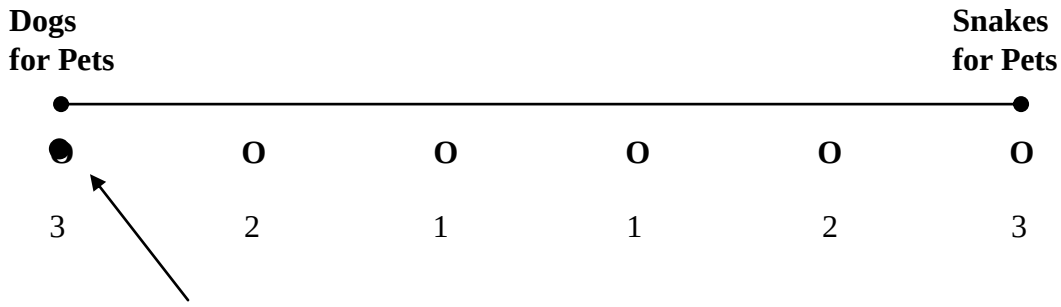
Directions: For items 1-8, you will see pairs of topics. Color the circle at the place on the line that indicates how much more interested you are in one topic than another. Please see the two examples below.

Example 1



I marked the line here, because I sort of like to eat celery but I really like to eat carrots.

Example 2



I marked the line here, because I am much more interested in having a dog for a pet than having a snake for a pet.

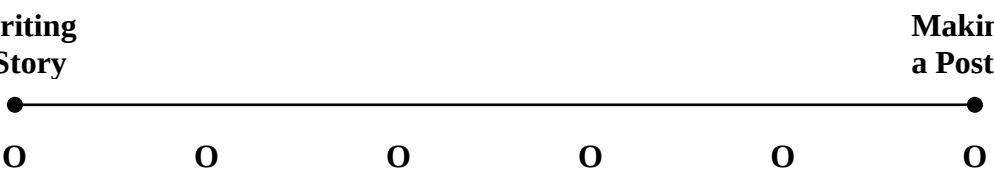
1. **Boats** **Trees**

2. **Social Studies** **Science**

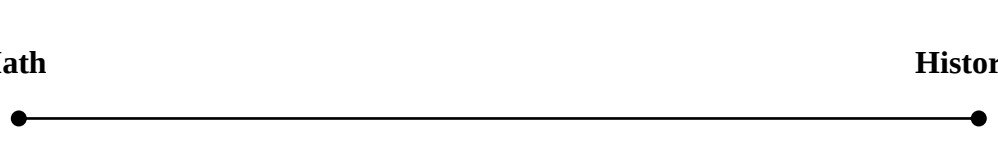
3. **Birds** **Bicycles**

4. **Green Beans** **Corn**

5. **Writing a Story** **Making a Poster**



6. **Math** **History**



7. **Learning about People** — **Learning about Machines**

8. **"Working with my Hands"** — **"Working with my Brain"**

What do I believe?

Directions: For items 1 and 2 below, you will see pairs of topics and a statement about your beliefs. Color the circle at the place on the line that indicates your beliefs about the two topics.

1. Which of these do you believe had the greatest effect on the invention of the airplane?

Knowledge about Birds — **Knowledge about Bicycles**

2. Which of these do you believe had the greatest effect on the invention of the printing press?

Knowledge about Written Language — **Knowledge about Writing Tools**

Topic Knowledge

Humans in Flight: Learning to Fly

<u>Directions</u>: Please circle the letter of the best answer for each item in this section.

1. The year of the Wright brothers' first flight was

   a. 1876.
   b. 1892.
   c. 1903.
   d. 1929.

2. The first flight was _____ long.

   a. 12 yards
   b. 120 feet
   c. 120 yards
   d. 1200 feet

3. The Wright brothers' plane was powered primarily by _____.

   a. an engine.
   b. kite wings.
   c. pedaling.
   d. wind.

4. The Wright brothers repaired many bicycles in their shop. Many of their early customers were

   a. bike racers.
   b. other inventors.
   c. neighborhood children.
   d. their friends.

5. One thing that the brothers learned from *bicycles* was that

   a. leaning was important for flying.
   b. a rudder was necessary for a plane.
   c. twisting wings was important for flight.
   d. plenty of speed was necessary to stay in flight.

6. What present form of transportation might have taught the brothers how to turn their plane?

a. Automobile
b. Motorcycle
c. Train
d. Boat

7. Birds' wings are designed to be _____ to keep them from being tossed by the wind while they fly.

a. light-weight
b. twisted
c. inflexible
d. oily

8. Which of the following birds would the brothers have consulted to help them design their plane?

a. Robins
b. Penguins
c. Bats
d. Eagles

9. What made the Wright Brothers different from other inventors was their belief that planes should

a. roll to turn.
b. brake to stop.
c. use wind for power.
d. be weighted for balance.

10. In the race to build the first airplane, the Wright Brothers were competing with

a. Hans von Liechtenstein.
b. Lars Gruber.
c. Charlie Taylor.
d. Otto Lilienthal.

11. The name of the brothers' bicycle company was

a. New Century Bicycles.
b. The Wright Cycle Company.
c. Wilbur and Orville Bikes.
d. Wright Brothers Cycles.

12. One of the brothers' early glider designs was modeled after

a. an inflated tire.
b. a flat bird wing.
c. a small bird.
d. a crushed box.

13. One of the lessons the brothers learned from their bicycle shop was that

a. Bicycles need wheels, but airplanes need wings.
b. Tools and supplies for bikes can be used for planes.
c. A plane needs a rudder to help the pilot control it.
d. Airplanes should not roll when they fly.

14. It is 1903, and the Wright Brothers want to hire another person to help them in their bike shop. Who is the person they will most likely hire?

a. A doctor
b. A mechanic
c. A race car driver
d. An astronaut

15. In order to allow a plane to come out of a roll, the Wright brothers looked to birds and developed a process called

a. tail-spinning.
b. wing-warping.
c. twist-flapping.
d. flap-flexing.

16. If you were going to design your own flying machine, you would design the wings to be _____ to allow wind current to lift your aircraft off the ground efficiently.

a. flat
b. flexible
c. ribbed
d. curved

17. The name of the brothers' first plane was

a. The Kitty Hawk.
b. The New Hero
c. The Flyer
d. The Winner

18. After their successful flight, the brothers traveled to

a. Russia.
b. Europe.
c. Australia.
d. China.

19. The first successful flight of the Wright Brothers' plane lasted

a. 1 hour 20 minutes.
b. 1 minute 20 seconds.
c. 12 minutes.
d. 12 seconds.

20. The Wright Brothers used a bicycle chain as a model for the _____ on their airplane.

a. tail
b. wing
c. engine
d. propeller

21. The mode of transportation that can best help you measure wind resistance is

a. a scooter.
b. a hot air balloon.
c. a tractor.
d. a speed boat.

22. The brothers tested _____ different wing designs before they found a design that worked.

a. 2
b. 60
c. 200
d. 6000

23. The Wright brothers used a wind tunnel to test airplane wings in the same way that

a. a researcher might test a new medication.
b. a teacher might test students on math facts.
c. a car company might conduct crash tests.
d. a computer programmer might test new software.

Appendix D

Post-Reading Measures
(Sample Packet for Bicycle Condition)

_____

DIRECTIONS

Wilbur and Orville Wright were two brothers who invented an airplane. Their invention gave humans the experience of flight. Imagine that you are an employee at a large museum about transportation and that you work in the bicycle exhibit. Your boss has put you in charge of making a display, like a poster, to tell museum visitors how bicycles helped the Wright Brothers learn to fly. Read the following article about the Wright Brothers in order to learn as much as possible about how bicycles helped the brothers learn to fly to best create your display.

Humans in Flight

Part 1

Something amazing happened on a sandy beach at Kitty Hawk, North Carolina in 1903. Wilbur and Orville Wright were brothers. They were on the beach one morning. They had a flying machine they had built themselves. The brothers called their airplane the *Flyer.* Orville Wright took off in the machine. He flew a distance of 120 feet in the air before he landed. This was the first successful airplane flight in the world. The brothers studied bicycles and birds to learn how to build their historic airplane.

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Many people had tried to build flying machines. One big problem they faced was keeping the machine steady. The Wrights learned how to control an aircraft in flight by watching how birds fly. They paid attention to how large birds such as seagulls flew. The brothers noticed that the birds twisted the tips of their wings. This kept the birds from being tossed by the wind.

Now Wilbur and Orville could control their plane. But they needed to learn how to make it turn. They thought about how a cyclist turns when riding a bike. The brothers knew that when you want to turn a bike, you must lean. You don't just twist the handlebars. They needed to find a way to make the airplane lean, similar to how a cyclist makes a bicycle lean.

The brothers watched how birds turn too. When a bird turns, its whole body rolls the same way. A pilot must be able to put the plane into a roll. The pilot must also be able to bring the wings back into a horizontal position.

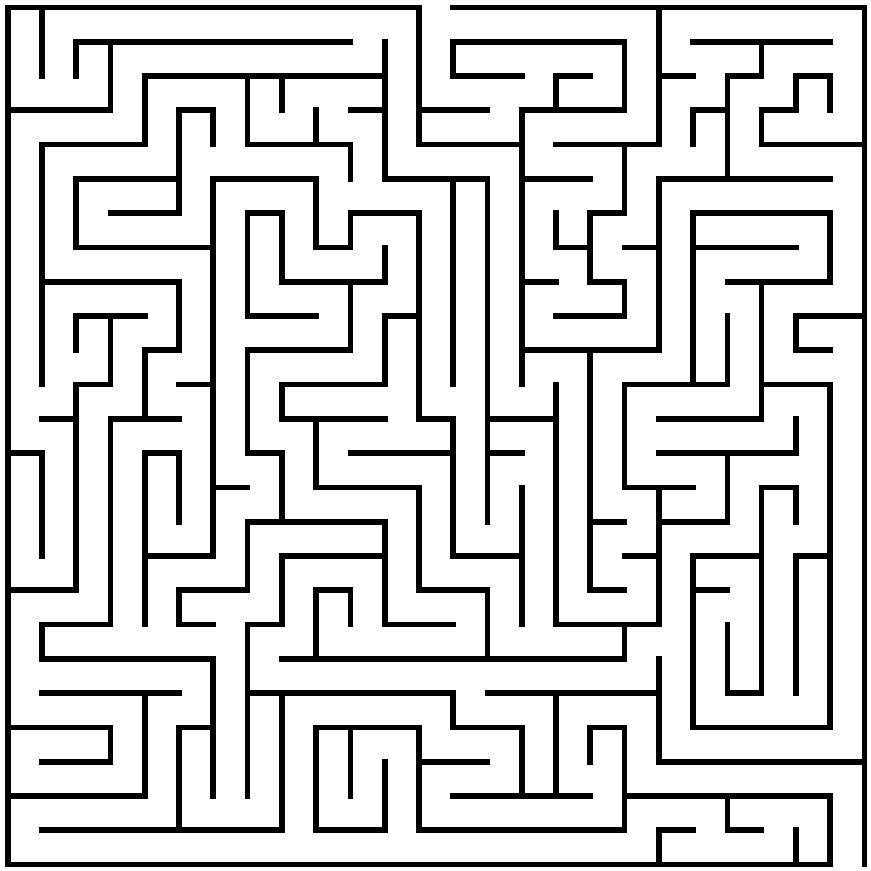
Cyclists lean and birds roll. The Wright brothers believed planes should lean and roll too. This idea made them different from other inventors at the time. Others believed the exact opposite. For them, rolling was dangerous and should be avoided.

Wilbur and Orville worked on a plan to make their plane turn. They invented a process called wing-warping. The wings of a bird are not rigid like a piece of wood. They flap and flex and change their shape. The brothers' plane would need flexible wings too. Wing-warping made it possible for the plane to turn. The brothers also attached a moveable rudder to the back of their plane. Like a bird's tail, the rudder allowed the plane to go up and down.

Please turn the page and follow the directions.

Directions: Trace a path through the maze.

START



FINISH

Please turn the page and follow the directions.

Directions: You have just read part of a story about the Wright Brothers. In the space below, please write down everything you can remember from the passage. If you can't remember exact wording, you can write words or phrases. You may use the back of the page if you need more space.

Please turn the page and follow the directions.

Questions—Part 1

Directions: Please circle the letter of the best answer for each item in this section.

1. Birds' wings are designed to be _____ to keep them from being tossed by the wind while they fly.

   a. light-weight
   b. twisted
   c. inflexible
   d. oily

2. The year of the Wright brothers' first flight was

   a. 1876.
   b. 1892.
   c. 1903.
   d. 1929.

3. What present form of transportation might have taught the brothers how to turn their plane?

   e. Automobile
   f. Motorcycle
   g. Train
   h. Boat

4. One of the brothers' early glider designs was modeled after

   a. an inflated tire.
   b. a flat bird wing.
   c. a small bird.
   d. a crushed box.

5. One thing that the brothers learned from *bicycles* was that

   a. leaning was important for flying.
   b. a rudder was necessary on a plane.
   c. twisting wings were important for flight.
   d. plenty of speed was necessary to stay in flight.

6. The first flight was _____ long.

a. 12 yards
b. 120 feet
c. 120 yards
d. 120 miles

7. The rudder on the Wright brothers' plane is most similar to which of the following simple machines?

a. Incline plane
b. Lever
c. Pulley
d. Wheel and Axle

8. Which of the following birds would the brothers have studied to help them design their plane?

e. Robins
f. Penguins
g. Bats
h. Eagles

9. The Wright brothers repaired many bicycles in their shop. Many of their early customers were

a. bike racers.
b. other inventors.
c. neighborhood children.
d. their friends.

10. The name of the brothers' first plane was

a. the *Kitty Hawk*.
b. the *New Hero*.
c. the *Flyer*.
d. the *Winner*.

11. What made the Wright Brothers different from other inventors was their belief that planes should

a. brake to stop.
b. roll to turn.
c. tilt for lift.
d. be weighted for balance.

12. In order to allow a plane to come out of a roll, the Wright brothers looked to birds and developed a process called

    a. tail-spinning.
    e. wing-warping.
    f. twist-flapping.
    g. flap-flexing.

13. Of the following, which is most likely something the Wright brothers also worked on in their shop?

    a. Helicopters
    b. Scooters
    c. Refrigerators
    d. Furnaces

Turn the page and continue to read for information to include in your imaginary display about BICYCLES.

Part 2

In their bike shop, the brothers made many of the parts themselves. They used simple tools like a lathe, a drill press, and cutting equipment. They even built a special engine to work the machinery in their shop. The skills they used to repair bicycles helped them to build their flying machine. They used what they knew about how to build machines to help them face the problems of flight.

People around the world were trying to build flying machines. A British inventor named George Cayley had an idea about the wings. He noticed that bird wings are not flat. They are curved. This special shape gives birds lift. It also gives them thrust. Humans cannot use their arms to create both lift and thrust. A machine was needed to do this. A German named Otto Lilienthal also studied birds to learn how they flew. He believed the wings of a flying machine needed to be shaped like a bird's.

The Wright brothers built a wind tunnel to test some of their ideas for airplane wings. A wind tunnel is a long box, open at one end with a fan at the other. The fan pushes air through the box. Models are placed inside so you can see how they work in a current of air. This tells you how a full-size object will react in real life.

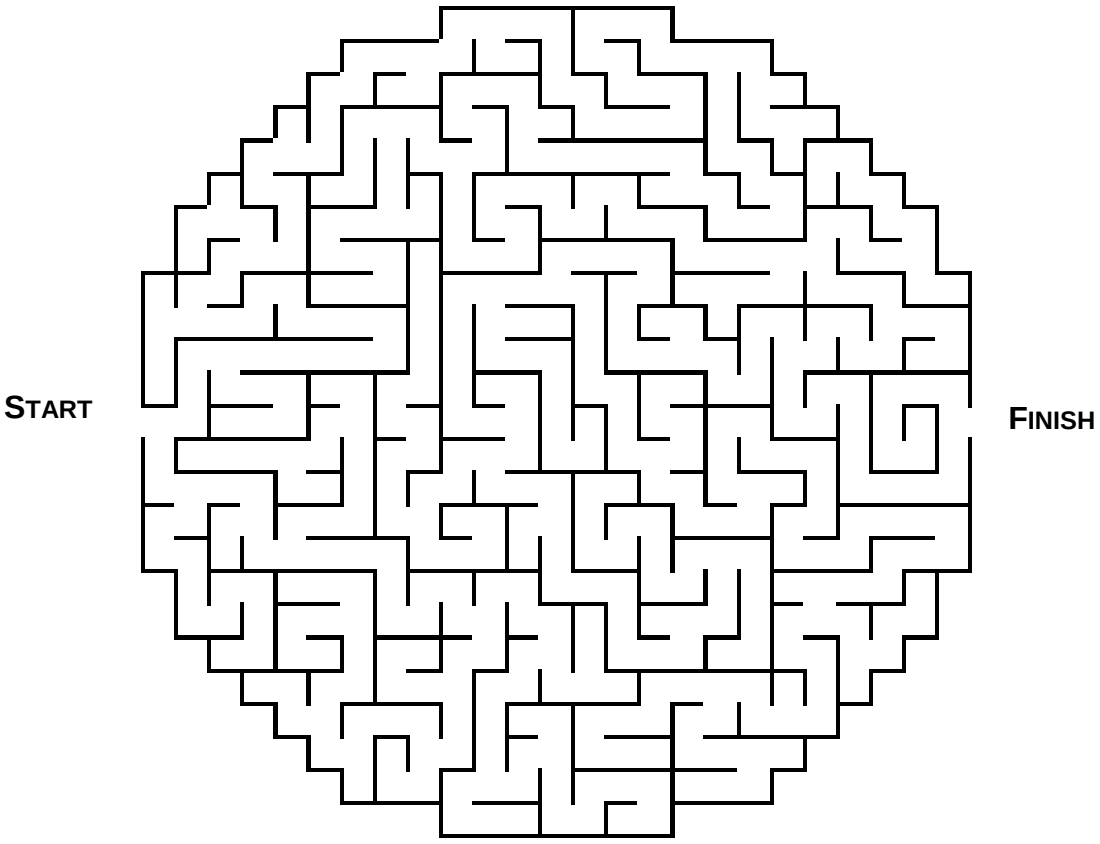
In their wind tunnel, the Wrights compared bird wings and airplane wings. Their wind tunnel was six feet long by two feet across. It had a glass panel at the top. This window allowed Wilbur and Orville to see what was happening inside. The fan blew air through the tunnel at 27 miles per hour. The brothers tested almost two hundred kinds of wings. They were looking for the perfect shape. They needed a shape that would give the most lift and the least drag.

After many test flights at Kitty Hawk, the Wright brothers went home to Dayton. Their work with bicycles gave them more ideas about flight. One day the brothers took turns pedaling one of their own bicycles. They rode as fast as they could down a city street. They had a third wheel on the front of the bike. The wheel was mounted flat on the handlebars. It spun freely. This third wheel had two metal plates on top of it. One plate was flat and the other was curved. They used this to measure wind resistance. This was an important step to building an airplane that would work.

Eventually the Wrights had a flying machine they could control. Orville Wright became the first person to fly in an airplane. It was a mid-December morning. His flight lasted only 12 seconds. But the brothers made more flights that day. The *Flyer* stayed in the air longer each time. They used what they knew about birds and bicycles to create the first successful airplane in the world. Some people called the brothers "The First Heroes of the New Century."

Please turn the page and follow the directions.

Directions: Trace a path through the maze.



Please turn the page and follow the directions.

Directions: You have just read part of a story about the Wright Brothers. In the space below, please write down everything you can remember from the passage. If you can't remember exact wording, you can write words or phrases. You may use the back of the page if you need more space.

Please turn the page and follow the directions.

Questions—Part 2

Directions: Please circle the letter of the best answer for each item in this section.

14. The brothers tested _____ different wing designs before they found a design that worked.

    a. 2
    b. 60
    c. 200
    d. 6000

15. When the brothers tested wind resistance, they mounted another _____ onto the front of their bike.

    a. brake
    b. wheel
    c. chain
    d. pedal

16. In their bicycle shop, the Wrights built a special engine to power

    a. bicycles for their friends.
    b. machines in their shop.
    c. fans for their wind tunnel.
    d. gliders for other inventors.

17. It is 1903, and the Wright Brothers want to hire another person to help them in their bike shop. Who is the person they will most likely hire?

    a. An inventor
    b. A mechanic
    c. A race car driver
    d. An astronaut

18. In the race to build the first airplane, the Wright Brothers were competing with

    e. George Cayley
    f. Lars Gruber.
    g. Otto Lilienthal.
    h. Charlie Taylor.

19. If you were going to design your own flying machine, you would design the wings to be _____ to allow wind current to lift your aircraft off the ground efficiently.

    e. flat
    f. flexible
    g. ribbed
    h. curved

20. The mode of transportation that can best help you measure wind resistance is

    a. a scooter.
    b. a hot air balloon.
    c. a tractor.
    d. a speed boat.

21. The first successful flight of the Wright Brothers' plane lasted

    a. 1 hour 20 minutes.
    b. 1 minute 20 seconds.
    c. 12 minutes.
    d. 12 seconds.

22. Bird wings help flight by giving birds

    a. lift and weight.
    b. drag and thrust.
    c. weight and drag.
    d. lift and thrust.

23. The Wright brothers used a wind tunnel to test airplane wings in the same way that

    a. a researcher might test a new medication.
    b. a teacher might test students on math facts.
    c. a car company might conduct crash tests.
    d. a computer programmer might test new software.

Thank you!

Perceived Interest Survey

Interest Survey*

Directions: For each of the questions below, color the circle of the response that best describes you.

1. I thought the text was very interesting.

   O Strongly Disagree
   O Disagree
   O Unsure
   O Agree
   O Strongly Agree

2. I'd like to talk about this text with others at some point.

   O Strongly Disagree
   O Disagree
   O Unsure
   O Agree
   O Strongly Agree

3. I would read this text again if I had the choice.

   O Strongly Disagree
   O Disagree
   O Unsure
   O Agree
   O Strongly Agree

4. I lost track of time while I was reading this text.

   O Strongly Disagree
   O Disagree
   O Unsure
   O Agree
   O Strongly Agree

5. I'll probably think about this text again for some time to come.

   O Strongly Disagree
   O Disagree
   O Unsure
   O Agree
   O Strongly Agree

6. I thought the topic of the text was fascinating.

   O Strongly Disagree
   O Disagree
   O Unsure
   O Agree
   O Strongly Agree

7. The text meant something to me.

   O Strongly Disagree
   O Disagree
   O Unsure
   O Agree
   O Strongly Agree

8. I would like to read more about this topic in the future.

   O Strongly Disagree
   O Disagree
   O Unsure
   O Agree
   O Strongly Agree

9. The text was one of the most interesting things I've read in a long time.

   O Strongly Disagree
   O Disagree
   O Unsure
   O Agree
   O Strongly Agree

10. The text really grabbed my attention.

O Strongly Disagree
O Disagree
O Unsure
O Agree
O Strongly Agree

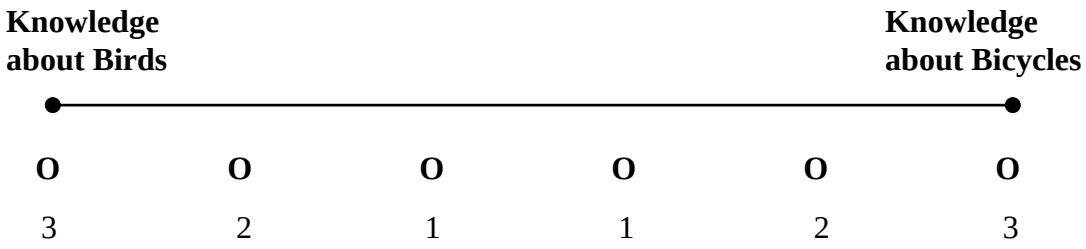
Please turn the page and follow the directions.

*Adapted for middle school from the Perceived Interest Questionnaire (PIQ): Schraw, G., Bruning, R., & Svoboda, C. (1995). *Journal of Reading Behavior*, *27*(1), 1-17.

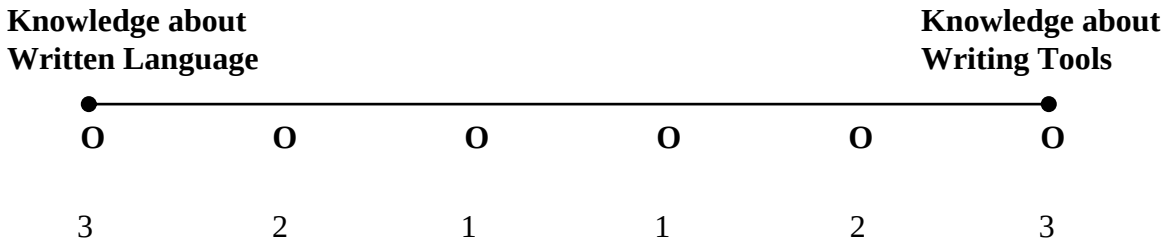
What do I believe?

Directions: For items 1 and 2 below, you will see pairs of topics and a statement about your beliefs. Color the circle at the place on the line that indicates your beliefs about the two topics.

1. Which of these do you believe had the greatest effect on the invention of the airplane?



2. Which of these do you believe had the greatest effect on the invention of the printing press?



Appendix E

Data Collection Protocols

Day 1 Data Collection

Hello, my name is _____. I am a researcher in Penn State's College of Education. Today and next Tuesday/Wednesday, Mr./Mrs. _____ has agreed to allow me to work with you on a research study. Our research team is interested in learning more about how students read and understand text. We are trying to find effective ways to help students like you. So your participation is very important. However, nothing you do as part of this research study will affect your grade. Your responses will be confidential.

Today I am going to ask you to provide me with 4 types of information:

1. Basic information about yourself and your class to allow me to match your responses to today's questions with responses to next week's questions;
2. information about your interest in some different topics;
3. what you believe about some topics; and
4. what you know about humans and flight.

I will start by giving everyone an envelope. Please do not open the envelope until I tell you to do so.

On the outside of your envelope is clipped an index card with a number on it. This is the number you will use to identify all of your materials in the study. To make sure I can match your responses to today's items with responses to next week's items, I would like you to write 4 things on the front of the card: *(Draw a diagram on the board to ensure this is done completely.)*

1. On the top left line: Your **first and last name**
2. On the line under your name: Your **gender**
3. On the line under your gender: Your **teacher's name**
4. On the next line: The number of this **period/rotation**

Crystal Ramsay
Female (or M)
Mr./Mrs. _____
Rotation II

1234

Please lay the card on your desk where you can see it. You will need to note that number on two ages later in the period.

There are two stapled packets of questions inside your envelope. Please open the envelope and pull out the top packet of questions. You will know you have the right one if the title at the top reads: **Which is more interesting?** *(Check to make sure everyone has the right pages.)*

*Please take a moment and record the number from your index card on the top of the front page.

Please follow along as I read the directions aloud:

> *For items 1-7, you will see pairs of topics. Color the circle at the place on the line that indicates how much more interested you are in one topic than another. Please see the two examples below.*
>
> *Look now at Example 1. The first topic, on the left side of the line, is CARROTS. The second topic, at the right side of the line, is CELERY. Notice that I colored a circle near carrots. I marked the line here, because I sort of like to eat celery but I really like to eat carrots.*
>
> *Now look at Example 2. The first topic, on the left, is DOGS FOR PETS. The second topic, at the right side of the line, is SNAKES FOR PETS. I marked the circle closest to DOGS FOR PETS, because I am much more interested in have a dog for a pet than having a snake for a pet.*

Now please take a few minutes to respond to the 7 items that follow. Do not go past the dotted line on page 3. We will do those two items together. When you finish the 7 interest items, please just wait quietly.

(Wait until everyone is finished.)

Now look at the next section. The section titled What do I think? contains only 2 items. They are much like the items you just completed, but there is a specific question you must respond to for each. Let's read them together.

1. Item 1: Which of these do you think had the greatest effect on the invention of the airplane?

   Knowledge about birds OR Knowledge about bicycles

   Mark the circle in the place that indicates what you think about this question.
2. Item 2: Which of these do you think had the greatest effect on the invention of the printing press?

   Knowledge about written language OR Knowledge about writing tools

Please return this packet of materials to your envelope and pull out the second packet of questions. You will know you have the right one if the title at the top reads: What do I know? *(Check to make sure everyone has the right pages.)*

*Please take a moment and record the number from your index card on the top of the front page. Do not begin until I tell you to do so.

You will now respond to some multiple choice items to determine what you know about humans and flight. Don't worry if you don't know some of the answers, but DO YOUR BEST. Please respond to all of the items. When you are finished, please return the packet to the envelope and quietly wait for others to finish.

BEFORE COLLECTING PACKETS:

Please take a moment and do the following:

1. Double check that your name is on your index card.
2. Check to be sure you wrote your number on both packets from the envelope.
3. (If time) Flip through the questions and make sure you answered all the items. Don't change anything; just make sure you've responded to all of the items.
4. Make sure both packets AND YOUR CARD are in the envelope.
5. Please pass them forward.

Thank you for your participation today. I will be back next week with the final pieces of the study.

Day 2 Data Collection

Before addressing students:

1. Distribute index cards from last week. *(Ask a student to do this.)* Students who were absent last week but who are here this week will need to complete an index card. (Instructions for this are later.)
2. Double check with teacher:
    a. Last week absent, this week present (We have separate packets for them.)
    b. Not-participating (I put a list in your folder.)

Before handing out new packets:

Hello. My name is _____. Recall that last week when I was here, I told you about a research study we are conducting at Penn State to investigate how middle school students understand the kinds of texts they often encounter in school. As participants in that study, you answered some questions about yourself, about what interests you, and about what you think about a couple topics. Today you will read a short article about the Wright Brothers and answer some questions after you read. Remember, while we need your best effort, how you respond to the questions you are asked in this study will not be reported to your teacher nor will your responses affect your grades in any way.

Who was not here last week? If you were not here last week, I have a modified packet for you. I'll share it with you once I get others started.

For those of you who *were* here, I have envelopes with new materials inside. I'm going to pass them out now. Please do not open them until I tell you to do so. *(Pass out envelopes to all who were present last week.)*

Just like last week, there are 2 stapled packets inside. Please pull out both packets and write your number at the top of each. Once you've recorded your number on both packets, please drop your card into the envelope. You won't need it again.

Today's materials are self-paced. You may finish sooner or later than those around you. That's okay. To keep you organized, and so you complete materials in the right order, please do the following:

1. Put your envelope in the middle of your desk.
2. On top of that, place the smaller packet of materials. It reads: **Interest Survey** at the top.
3. On top of that, place the thick packet of materials. You will begin with these. (Don't open anything yet!)

Inside the pages, you'll find the article I described, a couple puzzles, and a number of types of questions. You will need to work steadily.

Here are the rules: *(Write the words that are in capitals on the board.)*

1. **READ ALL DIRECTIONS** on every page. Very carefully.
2. Everything in the packets serves a purpose and is in a particular order. Please **DO EACH PAGE IN ORDER.**
3. **DO NOT LOOK BACK**—Once you finish, do not look back at anything you've already completed.

Are there any questions?

Distribute modified packets to absentees. Theirs is just like the others, but it includes some of the measures from last week as well. Have them fill out an index card them complete all materials in the packet in order.

CRYSTAL M. RAMSAY
VITA

EDUCATION

Master of Science, Educational Psychology (08/2007)
The Pennsylvania State University, University Park, PA

Master of Education, Curriculum and Instruction (12/1999)
The Pennsylvania State University, University Park, PA

Bachelor of Science, Secondary Education, Social Studies (05/1992)
The Pennsylvania State University, University Park, PA

SELECTED PUBLICATIONS AND PRESENTATIONS

Antiliou, A., Ramsay, C. M., Murphy, P. K., & Fast, J. R. (under revision). *Weighing orthogonal realities: How students process intratextual persuasive messages.* Contemporary Educational Psychology.

Ramsay, C. M., & Sperling, R. A. (2010). Designating reader perspective to increase comprehension and interest. *Contemporary Educational Psychology, 35,* 215-227.

Ramsay, C. M., & Sperling, R. A. (2010). *Exploring main idea generation via electronic note-taking: A mixed methods study.* Manuscript submitted for publication. Journal of Literacy and Technology.

Ramsay, C. M., & Sperling, R. A. (in press). The role of relevance instructions in purpose-driven comprehension. In M.T. McCrudden, J. P. Magliano, & G. Schraw (Eds.), *Text Relevance and Learning from Text* (pp. XX-XX). Greenwich, CT: Information Age Publishing.

Ramsay, C. M., Sperling, R. A., & Dornisch, M. M. (2010). A comparison of the effects of students' expository text comprehension strategies. *Instructional Science, 38*(6), 551-570.

Sperling, R. A., Ramsay, C. M., & Dornisch, M. M. (2010). *"I don't know and I don't care!"—Prompting situational interest to facilitate comprehension when students lack prior knowledge and domain interest*. Manuscript in preparation.

Sperling, R. A., Ramsay, C. M., Richmond, A. S., & Klapp, M. (in press). *The Measurement and Predictive Ability of Metacognition in Middle School Learners*. Journal of Educational Research.
