ABSTRACT

Title of Document: EXPLORING THE INTERPLAY BETWEEN FIFTH-GRADE READERS' KNOWLEDGE, INTERESTS, AND BELIEFS AND THEIR PERCEPTIONS OF THE PERSUASIVENESS OF TEXT

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This study explored the interplay between fifth-grade readers' knowledge, interests, and beliefs and their perceptions of the persuasiveness of text. This study explored three research questions: (a) In what ways do fifth-grade readers differentially perceive the persuasiveness of argument and explanation structures? (b) What is the relation between fifth-grade readers' perceived knowledge, demonstrated knowledge, interests, and beliefs prior to and after reading persuasive text? (c) In what ways are perceptions about the persuasiveness of text associated with fifth-grade readers' perceived knowledge, demonstrated knowledge, interest, and beliefs?

Fifth-grade readers (n =53) read two texts, one written in the argument structure and the other in explanation structure. Readers' perceived knowledge, demonstrated knowledge, interests, and beliefs about the text topic were measured before and after reading the texts. Readers rated the persuasiveness of each text after reading both texts. Four readers were selected to participate in a retrospective verbal report.

The data analyses produced several interesting findings related to the interplay of readers' knowledge, interests, beliefs and perceived persuasiveness of text. Text structure did not independently influence elementary-aged readers' perceptions of the persuasiveness of a text. Elementary-aged readers found the argument and explanation text structures to be equally persuasive.

Elementary-aged readers' perceived knowledge, demonstrated knowledge, interest and beliefs were positively related before and after reading. Additionally, readers' knowledge was related to their beliefs. The more readers knew the more they tended to agree with the stance of the author. Readers' perceived knowledge was related to their interest level. The less a reader felt they knew about the topic, the less interested they were. Readers' beliefs and interests after reading were related.

Finally, elementary-aged readers' learner characteristics and their rating of the persuasiveness of texts were associated. Readers' pre-reading beliefs, demonstrated knowledge, and interest predicted the most variance related to readers' rating of the persuasiveness of text. Readers' pre-reading beliefs, interests, and demonstrated knowledge predicted how persuasive they rated the texts. After reading, their beliefs and interests predicted the most variance in their ratings of the persuasiveness of the texts. Readers' interests and beliefs after reading predicted their ratings of the persuasiveness of texts.

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by

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It is with great pride and accomplishment that I look forward to answering the question, "Are you done yet?"

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CHAPTER I

INTRODUCTION

Expectations associated with being 'literate' have evolved in increasingly

complex and sophisticated ways (de Castell & Luke, 1986; Heath, 1991; Resnick &

Resnick, 1977). No longer are the skills historically associated with being literate, such as

writing one's name or reading fluently, considered adequate (Heath, 1991). The ability to

evaluate and critically think about textual messages is imperative as conflicting and

potentially misleading information increasingly reaches readers (Alexander & Jetton,

2000; Commeyras, 1993). Mass media outlets and the Internet are bringing an expanding

variety of opinions and messages to our attention (Leu, 2000). Whether being told for

whom to vote, what to eat, how to dress, where to shop, or how to think, individuals are

subjected to messages that attempt to sway them at every turn.

A persuasive message is defined as any message intended to shape, reinforce, or

change the responses of others (Miller, 1980). While one could argue that all

communication has the potential to influence the responses of others, a distinguishing

characteristic of persuasion is the focus of eliciting an intended response (Stiff &

Mongeau, 2003).

The effect of persuasive messages has been of interest for centuries, dating back

to Aristotle. Early models of persuasion focused largely on the structure and quality of

the message (Allport, 1935; Hovland, Jannis, & Kelly, 1953). The credibility of the

communicator, the content of the evidence, and the inclusion of emotional appeals were

message factors considered important in these early models (Cooper, 1932; Hovland et

al., 1953). These elements of the message are still considered important in considerations

in evaluating the effectiveness of persuasive messages (Murphy, 2001). However, these theorists paid little attention to the role of the recipient in determining the persuasive effect of a message. The effectiveness of persuasion was based disproportionately on the message and its unidirectional impact on an audience. The persuasive message was thought to provoke the same reaction in each individual who heard it; individual differences did not have a place in these theories.

Much like early views of persuasion, early models of reading focused primary on the influence of text on the reading process. Text-based models of reading state that through careful structuring of information an author could elicit a response in the reader (Meyer, 1985; van Dijk & Kinstch, 1983). Through the careful design of the text, an author imparts information to readers for specific purposes. Text design was thought to active readers' schema for that particular type of text. For instance, a readers' recognition of the structure of persuasive text would enable the reader to activate the appropriate persuasive text schema. However, what if a reader does not recognize the persuasive text structure, or they deem another structure persuasive? As with early views of persuasion, texts were thought to stimulate similar reactions in each reader, leaving little room for individual differences. The structure of a text is an integral aspect of the reading process (Chambliss & Calfee, 1998; Englert & Hiebert, 1984; RRSG, 2002). However, the structure of a text is not guaranteed to elicit the type of response an author may have set out to accomplish in each reader.

Recently, theories of persuasion and reading have shifted to accommodate the interaction of the reader and the text. Research has identified several learner characteristics, such as knowledge, interest, and beliefs that are influential in the

persuasion process of adult readers (Alexander, Buehl, & Sperl, 2001; Alexander, Murphy, Buehl, & Sperl, 1998; Buehl, Alexander, Murphy, & Sperl, 2001; Dole & Sinatra, 1994, 1998; Murphy, 1998). The persuasion process is now conceived of as the process of altering an individual's knowledge and beliefs that underlie one's perspective by fostering a deeper processing or reflection of the topic (Alexander et al., 2001; Buehl et al., 2001; Murphy, 1998; Murphy & Mason, 2006). Therefore, individuals' knowledge and beliefs on a particular topic are important considerations in the persuasion process.

Researchers have also identified text characteristics that tend to make text more persuasive. Text structure, content, and comprehensibility have all been found to be important text considerations that influence adults' reading of persuasion (Chambliss, 1994; Chambliss & Garner, 1996; Murphy, 2001; Stiff & Mongeau, 2003). One text structure, argument structure (Toulmin, 1958), has been proposed as a structure for persuasive text (van Dijk & Kintsch, 1983). The argument structure consists of a claim supported by evidence and warrants. Toulim's (1958) structure for an argument is designed to clearly articulate the reason associated with the claim through inclusion of evidence as well as warrants, which state the principle or foundation upon which the claim is based. The author's purpose in composing text with the argument structure is to support the claim and convince readers to do the same. Texts that engage readers on a deeper level, such as explanation structure (Chambliss, Christensen, & Parker, 2003) have been identified as potentially persuasive (Chambliss, 1994). Explanation structure is written to fill gaps in the readers' understanding of a particular topic or phenomenon through examples and sub-examples (Chambliss & Calfee, 1998; Rowan, 1988, 1989). The author's purpose in composing text with the explanation structure is to address any

misunderstanding readers may have about the topic, and replace it with accurate information. In both structures, the author is asking readers to alter either their understanding or stance about a topic.

While research has provided insights about how text and learner characteristics influence adult readers, we do not know whether the same relations hold for younger readers. This study was designed to explore this gap in the research. An understanding of the interaction of persuasive text and young readers would contribute to a lifespan approach to the development of reading competence (Alexander, 2005/6). In order to grasp the intricacies of the reading process, it is necessary to explore a variety of readers reading a variety or texts. An understanding of the interplay of persuasive text and young readers would allow for more thorough instructional approach to persuasive text in elementary school. Fostering in young readers the ability to critically evaluate persuasive text will help them develop as literate members of society. However, young readers' perceptions of persuasive text are unknown.

Presently, we know little about how elementary-aged readers read and comprehend persuasive texts and even less about how persuasive texts affect the knowledge, beliefs, and interests of these readers. Arguably, young readers are exposed to many and varied persuasive messages in their everyday lives. Their ability to sift through and decide what to accept is an increasingly important skill in a world in which a variety of sophisticated content is readily accessible (Alexander & Jetton, 2000; Commeyras, 1993; Leu, 2000).

Interactive Approaches to Persuasion and Reading

Interactive views of persuasion (Alexander et al., 1998; Buehl et al., 2001; Dole & Sinatra, 1994, 1998; Murphy, 1998. 2001) and reading (Nystrand, 1986; RRSG, 2002; Rosenblatt, 1978; Stanovich, 1980) serve as the basis for the current study. These interactive approaches acknowledge the interrelated nature of message and receiver characteristics. According to the interactive or multi-faceted view of persuasion, the persuasion process is involves an interplay between characteristics of the learner and the qualities of the text (Alexander et al., 1998; Buehl et al., 2001; Murphy, 1998). The interactive view of reading is based on the transaction between the reader, the text, and the context (Rosenblatt, 1978; RRSG, 2002; Stanovich, 1980).

An Interactive View of Persuasion

While past research and theories on persuasion have focused on audience or message characteristics, recent work emphasizes both (Alexander et al., Buehl et al., 2001; Dole & Sinatra, 1994, 1998; Murphy, 1998). Individual characteristics and their influence on individuals' responses to persuasive messages as well as the influence of the content and structure of the message have been explored with adults. The constructs of knowledge, beliefs, and interest have been found to be influential characteristics in the persuasion of adults.

Knowledge. Knowledge has many different meanings, but generally is a measure of what one knows about a particular topic. In the past, a lack of a consensus with regard to a definition of knowledge has led to inconsistent findings in the past with regard to the role knowledge plays in the persuasion process (Johnson, Lin, Symons, Campbell, & Ekstein, 1995; Showers & Shrigley, 1995). In this study, knowledge is conceived of as

"all that is accepted as true that can be externally verified and can be confirmed by others on repeated interactions with the object (i.e., factual)" (Murphy and Mason, 2006, pp. 306).

Knowledge can be further categorized depending on form and function. For instance, topic knowledge is, "the intersection between one's prior knowledge and the content of the specific passage or discourse" (Alexander, Shallert, & Hare, 1991, p. 333). Various forms of knowledge and the relationship of knowledge with persuasion have been studied. Text structure knowledge (Chambliss, 1995; Chambliss & Murphy, 2002), subject matter knowledge (Alexander, Jetton, & Kulilowich, 1995; Murphy & Alexander, 2002), and prior knowledge (Hynd, McWhorter, Phares, & Suttles, 1994) have all been studied in relation to persuasion. As will be described in the next chapter, Murphy (1998) and Buehl et al. (2001) studied not only topic knowledge, but the relationship between persuasion and adults' perceived and demonstrated topic knowledge.

Past experiences with and knowledge about a particular topic can alter how a person perceives that topic. For instance, a person who possesses a high level of knowledge about assisted suicide may be influenced by a persuasive text differently than a person with little knowledge (Buehl et al., 2001). Alexander and her colleagues (Alexander et al., 1998, 2001) have defined adult readers' persuasion levels based on a change in beliefs before and after reading. This enabled researchers to explore the influence of the texts on altering readers' beliefs regardless of whether they agreed with the author. Knowledge played a significant factor in persuasion. The more adult readers knew, the less change in beliefs they experienced before and after reading. Presumably, this is due to the fact that they had high initial beliefs because of their high knowledge

level. Therefore, the influence of the knowledge that adult readers bring to the act of reading persuasive text is idiosyncratic to the individual.

Beliefs. Beliefs are conceptualized as understandings, opinions, stances, or experiences that individuals often characterize by some valence of truthfulness or worthiness (Petty & Cacioppo, 1986). Beliefs are often mentioned in the same breath as knowledge, and the two seem to be inextricable (Murphy & Mason, 2006). For instance, beliefs are often portrayed in the persuasion literature as emerging from one's knowledge base (Alexander & Dochy, 1994; Dole & Sinatra, 1994). Beliefs do not require verification and often cannot be verified, yet individuals attribute much importance to them, often holding on to their beliefs despite contradictory evidence (Murphy & Mason, 2006). A common element between knowledge and beliefs is that both do not necessarily need to be accurate, as they are individual constructions or understandings (Alexander et al., 1991). Social psychologists have found that when presented with information, learners are greatly influenced by what they already believe and know (Eagly & Chaiken, 1993). Therefore, few learners abandon what they know and believe in many situations that involve persuasive messages.

At the same time, persuasive messages have been shown to alter readers' beliefs. For example, high school students were found to have more positive beliefs (attitudes) about nuclear power after exposure to a persuasive message extolling the benefits of nuclear power (Showers & Shrigley, 1995). These readers altered their beliefs as a result of reading the persuasive messages, illustrating that alteration of beliefs can result from persuasive text.

Nickerson (1991) illuminated the influential role beliefs play in the evaluation of the evidence contained in an argument. An ideal thinker would be able to put aside her preconceived beliefs and weigh evidence contained within an argument on the basis of the logic and rationality of the evidence alone. This ideal thinker would then be able to make an unbiased decision with regard to whether she should retain or discard her beliefs, but humans do not easily abandon their beliefs. Due to limitations with memory, knowledge, and reasoning, people do not effectively weigh the evidence that is presented to them. They tend to seek out evidence which supports what they already believe (Nickerson, 1991). This phenomenon is referred to as *case-building* and illustrates the role that prior beliefs play in the persuasion process (Chambliss, 1995).

In general, the degree to which the receiver's beliefs are consistent with those supported within the message plays a role in the receiver's perception of the message (Johnson et al., 1995; Kardash & Scholes, 1995, 1996). Regardless of the strength of the argument, message receivers are more apt to find the message that aligns with their initial beliefs to be more persuasive (Johnson et al., 1995). In fact, Johnson et al. (1995) found that messages that countered audience beliefs were deemed less persuasive, despite containing equally strong arguments. With persuasive messages, older readers' belief systems guide them in evaluating, critiquing, and considering the message as a whole.

Interest. Interest is similar to knowledge in that a wide variety of types of interest have been identified. Researchers today have conceptualized several different types of interest (Hidi, 1990). *Individual interest* can be described as a long-term form of interest that has an internal locus and the individual has a personal investment in the topic or domain (Alexander, Kulikowich, & Jetton, 1994; Hidi, 1990). *Situational interest* in

contrast tends to be superficial in nature and short-lived, and is most often evoked by something in the environment (Alexander et al., 1994; Hidi, 1990). Individual interest has a much longer duration and tends to develop over a longer period of time than situational interest (Hidi, 1990). *Text-based interest* is "interest generated by reading interesting sentences across subjects…[that] results from the interaction of textual features and the individual reading the text" (Hidi, 1990, p. 551). Text-based interest is most often categorized as a type of situational interest (Hidi, 1990) but can also spark individual interest (Alexander & Jetton, 1996).

Interest is central in determining the selection and persistence with particular information as opposed to other information (Hidi, 1990). For this reason, Hidi (1990) proposed that "interest plays a major role in the course and outcome of our mental activities" (p. 549). Not surprisingly, interest has emerged as an important factor in not only learning, but in persuasion as well. Readers' interest levels influence their willingness to abandon their existing beliefs and adopt the authors in a variety of ways (Chambliss & Garner, 1996; Dole & Sinatra, 1994; Murphy, 1998).

In summary, the multi faceted, interactive view of persuasion states that an individual's knowledge, interest, and beliefs influence the persuasion process of adults. While this model is robust, it is unclear whether the model of persuasion is similar in children. Stein and Miller (1991) identified distinct developmental differences between adult's and children's facility with argument and persuasion. Therefore, it cannot be assumed that the interactive approach to persuasion will apply to children.

Interactive Model of Reading

Interactive views of reading consider the text, the reader, and the context to be symbiotic dimensions of the reading process (Nystrand, 1986; Rosenblatt, 1978; RRSG, 2002; Stanovich, 1980). Recognition of the reader's agency in the reading process takes into account all that the reader brings to the task of reading. Several factors, such as the context, reader, and the text influence the reading process. The context of the interaction between the reader and the text is an important consideration in the reading process. Also, a reader's sociocultural background, including prior knowledge, previous experiences, interests, and purpose in reading, influence the reading process (Nystrand, 1986; RRSG, 2002). Text structure and design also plays an important role in the reading process.

Rosenblatt (1978) proposed that reading should be viewed as a transaction between a reader and the text. "Every reading act is an event, or a transaction involving a particular reading and a particular pattern of signs, a text, and occurring at a particular time in a particular context" (Rosenblatt, 2005, p. 7). Not only does an individual reader bring a set of unique characteristics to a text, but each and every time a reader reads a text there is a unique context surrounding the transaction. Certain characteristics that readers' possess seem to contribute more than others to the processing of text. In particular, adult readers' knowledge, interest, and beliefs about a topic are influential as they read persuasive text.

Stanovich's (1980) interactive model of reading places readers and their prior knowledge in the center of the reading process. Prior knowledge or a reader's schema has been identified as an important factor in the reading process (Afflerbach, 1990; Anderson & Pearson, 1984; McKeown, Beck, Sinatra, & Loxterman, 1992). As has been found

with persuasion research, knowledge is an important factor in the reading process (Alexander et al., 1998; Buehl et al., 2001; Murphy, 1998).

The influence of prior knowledge and experiences on literacy is extensive. Consider a young reader processing a text on frogs. This reader has learned about frogs in television programs, books, observations in the classroom, walks through the woods with her family, talks with her grandfather, visits to museums, and the frogs she finds in her community pool. In each of these instances, the young reader is engaged in a language exchange to varying degrees. Some are two-way interactions while others are unidirectional, but each potentially contributes to her literacy background and knowledge about frogs. This young reader has a wealth of knowledge that influences her as she reads a particular text. Consider this young reader engaged in reading a text written with the purpose of persuading readers of the danger global warming poses to frogs in Amazon rainforest. Her knowledge, interest, and beliefs about frogs will likely play a part in her processing of this text and her acceptance of the author's stance. All of these prior literate acts influence her reading of the text.

Readers call forth a wide variety of processes as they read. Expert readers reflect on ideas in text; predict and hypothesize about text with the use of prior knowledge; are passionate about their responses to text; and critically evaluate what they read (Pressley & Afflerbach, 1995). These processes are sophisticated and unique according to each individual and each text.

The interactive view of reading does not neglect the author or the text. The author writes with a purpose in mind and makes choices and decisions along the way that influence the reader (Kinneavy, 1971). The word choice, organization, structure and

information included in the text are chosen with a purpose in mind (Swales, 1990). The author must anticipate how a reader will process the text in order to achieve his or her purpose (Smith, 1983). The author may anticipate that a young reader will have seen a frog before and attempt to trigger the reader's prior knowledge and experiences. The author may also anticipate that a young reader may not have prior first-hand experience with climbing Mount Everest, so the author may engage various illustrations, such as describing a lack of oxygen and the cold temperatures, to help the reader relate. The reader may or may not oblige the author in realizing the purpose of the text. However, the decisions the author makes are intended to influence a reader.

<div align="center">Study Overview</div>

This study is designed to explore the association between fifth graders' learner characteristics and their perceptions of the persuasiveness of text. One text characteristic in particular--text structure—has been found to be an important factor in the reading process (Chambliss & Calfee, 1998; Englert & Heibert, 1984; RRSG, 2002). Text structure influences the degree to which older readers abandon their beliefs or misconceptions (Allen, 1991; Buehl et al., 2001; Dole & Sinatra, 1994, 1998; Dole, 2000; Guzzetti, 2000; Guzzetti, Snyder, Glass, & Gamas, 1993; Hynd, Alvermann, & Qian, 1997; Hynd et al., 1994). Yet the influence of text structure on young readers' reading of persuasion is not clear. Do young readers' find persuasive text persuasive? Can they detect the structure of persuasive text? Additionally, readers' perception of the persuasiveness of text is a neglected area of research for both children and adults (Murphy, 2001). Without consideration of the influence of persuasive text on readers of all ages, the effectiveness of text written to persuade is unclear.

In addition to text characteristics, the individual characteristics a reader brings to the task of reading are also important factors in the reading process (Nystrand, 1986; Pressley & Afflerbach, 1995; RRSG, 2002). In the persuasion literature, certain characteristics have been identified as influential in adults' processing of persuasive text. In particular, learner characteristics such as knowledge, interest, and beliefs have been found to influence adults' degree of persuasion as they read persuasive text (Alexander et al., 1998, 2001; Buehl et al., 2001; Murphy, 1998). The potential influence of these learner characteristics is unclear with younger readers as they read persuasive text. While the importance of such reader characteristics as prior knowledge (Afflerbach, 1990; Pressley & Afflerbach, 1995) and sociocultural background (Nystrand, 1986) have been identified as important in the reading process, the specific influence of learner characteristics on elementary-aged students' reading of persuasive text has not been explored.

The purpose of this study is to explore the interplay of fifth-grade readers' knowledge, interest, and beliefs and their ratings of the persuasiveness of texts. Three research questions that were based on similar research with adults (Buehl et al., 2001) guided the study:

1. In what ways do fifth-grade readers differentially perceive the persuasiveness of argument and explanation structures?

2. What is the relation between fifth-grade readers' perceived knowledge, demonstrated knowledge, interests, and beliefs prior to and after reading persuasive text?

3. In what ways are perceptions about the persuasiveness of text associated with fifth-grade readers' perceived knowledge, demonstrated knowledge, interest, and beliefs?

To investigate these three research questions, 53 fifth-grade readers read two texts, one written in the argument structure and the other in explanation structure. Their perceived knowledge, demonstrated knowledge, interests, and beliefs about the text topic were measured both before and after reading the texts. The readers rated the persuasiveness of each text after reading both texts. To further explore their perceptions about the persuasiveness of text, four students were selected to participate in a retrospective verbal report.

Given the similar author's purpose in explanation and argument text structures it is expected that fifth-grade readers will rate the persuasiveness of the texts similarly. Text organized in the argument structure presents evidence and warrants in support of a claim (Toulmin, 1958). The author's purpose is to support the claim through careful inclusion of evidence and warrants. Explanation is written to fill gaps in the readers' understanding of a particular topic or phenomenon (Chambliss & Calfee, 1998). The author's purpose in writing explanation is to address gaps in readers' understanding through various examples and sub-explanations. Both text structures present information to readers in a way that aims to alter their understanding or stance about a topic. Since the two structures share similar and related purposes, it is likely that fifth-grade readers will rate these structures equally.

Previous research has shown that adults' knowledge and beliefs are related before and after reading persuasive texts. In particular, this research has demonstrated that

adults' knowledge plays a role in the level of belief change after reading (Alexander et al., 1998; Buehl et al., 2001; Murphy, 1998). Therefore, it is expected that fifth-grade readers' perceived knowledge, demonstrated knowledge, interest, and beliefs will be related in a variety of ways before and after reading the texts. For example, it is likely that the fifth-graders' demonstrated knowledge and perceived knowledge will be related. Those readers' who know about the topic will likely have high levels of perceived knowledge as well. Readers' demonstrated knowledge, perceived knowledge, and beliefs will be related, as well. The more a reader knows, or think they know, about a topic, the more likely they are to agree with the stance of the author. Additionally, fifth-grade readers' perceived knowledge and interest, and their beliefs and interest will be related.

Previous research with adult readers found that readers' knowledge, interest, and belief levels influenced their level of persuasion (Alexander et al., 1998; Buehl et al., 2001; Chambliss & Garner, 1996; Murphy, 1998). Given this result with adult learners, it is expected that fifth-grade readers' learner characteristics will also be associated with their perceptions of the persuasiveness of the text. It is expected that readers' perceptions of the persuasiveness of the text will predict the level of change of particular learner characteristics. Readers' learner characteristics will likely predict their rating of the persuasiveness of the text. In addition, their rating of the persuasiveness of the text will be associated with a growth in their learner characteristics after reading.

The next chapter will provide an overview of the relevant literature that pertains to this study. Using the RAND Reading Study Group's (2002) elements of reading comprehension (the reader, the text, the purpose or activity) as a frame, relevant research is reviewed.

Definitions of Terms

Argument Structure refers to a text which consists of a claim, evidence, and a warrant (Toulmin, 1958).

> **Claim** is an assertion stated with the purpose of focusing the attention or beliefs of the audience (Toulmin, 1958).

> **Evidence** is the set of facts or examples offered in support of a claim (Toulmin, 1958).

> **Warrants** are the rules, principles, or foundation upon which the claim and evidence stand (Toulmin, 1958).

Explanation Structure refers to text written to fill gaps in the readers' understanding of a particular topic or phenomenon through various examples and sub-explanations designed to relate to readers' previous knowledge or experiences (Chambliss & Calfee, 1998).

Learner characteristics- see knowledge, beliefs, and interest.

> **Knowledge** refers to " all that is accepted as true that can be externally verified and can be confirmed by others on repeated interactions with the object (i.e., factual)" (Murphy & Mason, 2006, pp. 306).

> > **Perceived topic knowledge** "is a self-reporting of what individuals feel they know about a particular topic or topics" (Murphy, 1998, p. 10)

> > **Demonstrated topic knowledge** "entails the explicit sharing of information relative to a particular topic or topics." (Murphy, 1998, p. 10)

Beliefs can be conceptualized as understandings, opinions, stances, or experiences that individuals often characterize by some valence of truthfulness or worthiness (Petty & Cacioppo, 1986).

Interest in this study is a form of situational or text-based interest which results from the interaction of textual features and individuals reading the text (Hidi, 1990).

Persuasion is the process of altering an individual's knowledge and beliefs that underlie one's perspective by fostering a deeper processing or reflection of the topic (Alexander et al., 2001; Buehl et al., 2001; Murphy, 1998; Murphy & Mason, 2006)

Persuasive message is any message intended to shape, reinforce, or change responses of another or others. This definition of persuasion encompasses all *intentional* efforts to shape, reinforce, or change responses (Miller, 1980).

Persuasive text is any message "structured to counter the current beliefs of a typical reader as well as to present new ones" that incorporate the knowledge and beliefs of the reader (pg. 294, Chambliss & Garner, 1996).

CHAPTER II

LITERATURE REVIEW

The purpose of this review of literature is to provide an adequate basis for the current study through examination of relevant research pertaining to readers, persuasive text, and persuasion. The RAND Reading Study Group (RRSG, 2002) defined reading comprehension as, "the process of simultaneously extracting and constructing meaning through interaction and involvement with written language" (p. xiii). The RRSG explained that reading consists of three elements: the reader, the text, and the activity or purpose for reading. This review consists of three sections based on these elements. The first section presents an overview of research related to the reader, specifically focusing on upper elementary-aged readers. The next section overviews research related to the influence of the text on the reading process. The last section reviews research on the influence of learner characteristics on persuasion, or the purpose or activity associated with reading. Since the RRSG's (2002) elements of reading and the interaction of those elements serves as the theoretical basis of this study, it is used as the frame for the literature review. Each section concludes with a review of the issues as they pertain to that area of concentration.

The Reader

Reading involves various skills which interact and allow the reader to construct meaning while reading (Palinscar & Brown, 1984; Pressley, 2000). Reading is purposeful and active. A reader reads a text to understand what is read, to construct memory representations of what is understood, and to put that understanding to use (Pressley & Afflerbach, 1995). The RRSG (2002) stated that a reader comes to the task of reading

with a variety of cognitive capabilities (i.e. attention, memory, critical analytic ability, inferencing, visualization); motivation (i.e. a purpose for reading, interest in the content; self-efficacy as a reader); knowledge (i.e. vocabulary and topic knowledge, linguistics and discourse knowledge, knowledge of comprehension strategies); and experiences. Pressley (2000) separated the language skills associated with reading into those at the word level (i.e. decoding and fluency) and those above the word level (i.e. activation of prior knowledge and inferencing). This section briefly overviews the different language skills associated with reading specifically focusing on those which upper elementary readers have been found to demonstrate.

Word-Level Skills

Acquisition of word-level language skills is critical to readers' development (Snow, Burns, & Griffin, 1998; Stanovich, 1991). By third grade, readers are able to fluently read aloud and comprehend text written on their grade level (Snow et al., 1998). Those of us who work with children know that children's developmental differences can influence readers' ability to read fluently. Generally speaking, by third grade, the expectation exists that students are reading grade-level text fluently and understanding what they read. Word-level language skills such as decoding, fluency, and vocabulary knowledge play an integral role in reading comprehension. The studies selected for review illustrate the skills of fourth and fifth graders in relation to these word-level language skills.

Decoding is the process of breaking the code of written text in order to achieve word recognition (Juel, 1988). Those words which are not automatic for readers must be broken down in order to begin to recognize words and elicit meaning. Simply instructing

readers to recognize words is not the goal of decoding. Rather, an increase in the amount of automatically recognizable words hopefully supports reading comprehension (Pressley, 2000). Tan and Nicholson (1997) trained 7- to 10- year olds who were weak readers to recognize words without hesitation. The training condition also focused instruction on the meaning of those target words. Those in the trained condition were able to demonstrate higher comprehension of passages than their counterparts in the control condition. The ability of the trained subjects to rapidly decode words may have freed them up cognitively to focus instead on comprehending the passage. This study demonstrates that ease in decoding leads to higher comprehension among 7- to 10-year old, slow-progress readers.

Fluency is another critical factor in reading comprehension (National Reading Panel, 2000). Fluent readers are able to read with accuracy, speed, and expression. Both fluency and decoding are related to reading comprehension because of their potential impact on cognitive processing (Perfetti, 1992). If a reader is devoting the majority of his cognitive processing to decoding, little attention is available for comprehension. As word recognition skills such as decoding and fluency become efficient, the reader is able to devote more working memory to meaning construction. Jenkins, Fuchs, van den Broek, Espin, and Deno (2003) explored the connection between fluency and comprehension in fourth-grade readers. The researchers were specifically interested in (1) the influence of context and context-free reading skill to comprehension and (2) the examination of the influence of individual difference in context fluency (word recognition and comprehension skill) by identifying their contributions. The basis for this exploration was that context has been found to positively contribute to readers' fluency because they are

able to use the context to assist their reading (Stanovich, 1980). The researchers

presented fourth-grade readers with a folktale either presented in narrative (context) or

list (context-free) form. Readers' speed and accuracy were recorded for both passages.

The results found a strong association between reading fluency and comprehension.

Context reading speed predicted comprehension and context-free speed did not. This

finding illustrates that context fluency shared more processes in common with

comprehension.

    Vocabulary knowledge is another important contributing factor to reading

(National Reading Panel, 2000; Snow et al., 1998). The direct link between vocabulary

knowledge and reading comprehension has not always been clear (National Reading

Panel, 2000), mostly because many studies focused on superficial memorization of

vocabulary as opposed to deep processing (Beck & McKeown, 1991). When vocabulary

knowledge is fostered at a deep level, the link between vocabulary and reading

comprehension is clear. Cain, Oakhill, and Lemmon (2004) conducted two studies with

9- to 10-year-olds who exhibited a range of comprehension abilities. The aim was to

explore these readers' ability to use contextual information to infer the meaning of words.

They found that readers with weak comprehension skills were less able to infer meaning

of unfamiliar words than their skilled peers. This finding illustrates the connection

between the vocabulary skill of using context clues to determine meaning and reading

comprehension skill in older elementary readers.

    The second study was concerned with whether those children with poor

comprehension skills and weak vocabulary experience had vocabulary learning deficits.

Direct instruction of vocabulary definitions helped those readers with poor

comprehension skills, but did not help those readers with poor comprehension and weak vocabulary skills. This finding led to the conclusion that those with weak vocabulary and comprehension skills experienced more difficulty learning new vocabulary than their peers. This study illustrates the important role vocabulary skills play in upper elementary readers' reading comprehension.

Developmentally speaking, fifth graders should be fairly efficient at fluency and decoding, thus freeing them cognitively to devote attention to higher level language skills. Fifth-grade readers also have fairly developed vocabularies as well as skills related to vocabulary such as inferring meaning from context. These statements of generalization should be tempered with acknowledgment that various developmental differences in learners of all ages will impact readers' abilities. While efficiency in these word level skills are developmentally appropriate to expect by the fifth grade, not all readers will demonstrate facility with them.

Higher-Level Language Skills

Comprehension skills above the word level are important for reading comprehension. While this list is by no means exhaustive, some of the higher-level language skills involved in reading include: activation of prior knowledge, monitoring comprehension, asking questions, and inferring.

Prior knowledge plays an integral role in reading. The meaning that readers' construct as a result of reading text is influenced by the prior knowledge that they bring to the reading process (Afflerbach, 1990; Anderson & Pearson, 1984). Pressley and Afflerbach (1995) found that reading is an active process involving: prediction, visualization, monitoring comprehension, summarization, and interpretation; all of which

are dependent on the readers' prior knowledge. Prior studies have established that fifth graders had difficulty comprehending when they did not have the prior knowledge related to the topic which the textbook assumed they possessed (McKeown & Beck, 1990). A related study found comprehension was difficult when the textbooks the fifth graders were expected to read were not coherent (Beck, McKewon, & Gromoll, 1989).

As a follow up to their earlier studies, McKeown, Beck, Sinatra, and Loxterman (1992) conducted a study to examine the effect of prior knowledge on fifth graders' reading comprehension of more and less coherent social studies texts. Forty-eight fifth graders underwent training which provided background knowledge on the topic of the American Revolution. The texts were revised to make them more coherent. Readers read different versions of the texts. Readers were able to recall more information from the coherent texts. Instruction focused on background knowledge helped the comprehension of those readers of the more coherent text but not of the less coherent text. One explanation for this is that the background knowledge instruction focused on the American Revolution and one measure of knowledge focused on the French and Indian War, a neglected topic in the instruction. The authors hypothesized that readers who read the less coherent text erroneously relied on their background knowledge as opposed to what they read in the text, because they could not readily comprehend what was in the less coherent text. Therefore, the reliance on background knowledge alone limited their comprehension of the less coherent text. This study shows that fifth graders use and rely on their prior knowledge when constructing meaning from text.

Student questioning is another important skill in the active reading process (National Reading Panel, 2000). Student questioning is defined as self-generated requests

for information about a topic (Taboada & Guthrie, 2004). As students generate questions while they read they are assessing what they already know about the topic and what they want to know. Taboada and Guthrie (2006) conducted a study to investigate the relationship of student-generated questions and prior knowledge with reading comprehension. Three-hundred fifty third and fourth graders posed questions as they read science texts. Readers' prior knowledge before reading was assessed through a task which involved students' writing responses to prompts related to the topic. The questions readers generated were categorized with a hierarchy developed by the authors which contains 4 levels. Level 1 questions (lowest) were those that asked factual questions and Level 4 questions (highest) were those questions that combined two or more concepts related to the topic. Students' questions were positively associated with reading comprehension. When controlling for prior knowledge, students' self-generated questions contributed a significant amount of variance to reading comprehension. Therefore, regardless of content domain or topic, questioning is associated with reading comprehension. Prior knowledge and questioning did not significantly interact and they each benefit readers independently of each other. This study illustrates the importance of questioning and prior knowledge on third and fourth graders' reading comprehension as well as their ability to engage in these two skills.

Inferring is another high level language skill that is important in the active reading process (National Reading Panel, 2000). Cain, Oakhill, and Bryant (2004) investigated the associations between working memory and reading comprehension skills in children. The reading comprehension skills of interest in the study were inference making, comprehension monitoring, and story structure knowledge. The researchers studied a

group of 80 students at three time points, ages 8, 9, and 11 years. At each point children's reading ability, vocabulary, verbal skills, and working memory capacity were assessed. The results showed that at each time point, word-level skills (verbal and vocabulary skills) accounted for a large portion of variance in reading comprehension. However, higher-level processing skills (inference making and comprehension monitoring) as well as processing capacity (working memory) also accounted for unique variance in reading comprehension. Processing skills were not limited by processing capacity. Therefore, inference making and comprehension monitoring explained variance in reading comprehension in readers at each age. Upper elementary students then are able to effectively infer and monitor their comprehension as they read.

While all of the factors and skills a reader brings to bear during reading are not the focus of the current study, this section has several important implications for the current study:

- Reading is an active, purposeful process which involves several word-level processes such as decoding, fluency, and vocabulary skills. It is developmentally appropriate to expect that fifth-grade readers are efficient at utilizing these word-level skills.

- Reading involves higher-level language skills such as activation of prior knowledge, questioning, comprehension monitoring, and inferring. The studies reviewed showed not only that these skills played an important role in reading comprehension, but that fifth-grade students have demonstrated effective use of these skills and that these skills help young readers' comprehension.

The Text

Text also plays an influential role in the comprehension process (RRSG, 2002).

Two components of text which will be integral to the current study are text type and text

structure. First, studies which explored elementary students' ability to comprehend

expository text will be reviewed. Then, research which explored elementary students'

ability to recognize and use text structure during comprehension is reviewed. Finally,

studies exploring three potentially persuasive text structures--argument, refutation, and

explanation—are described.

Expository Text

Young children's ability to process and comprehend expository text has become

an important area of emphasis in reading research. Decades ago, researchers felt that

prior to attaining mastery of decoding and fluency, young readers who were not yet fluent

readers would not be able to attend to strategically comprehend text, especially

expository text (e.g. Chall, 1983). However, recent research has found that through such

methods as interactive read alouds, children as young as kindergarten are able to

comprehend expository text strategically and recognize and employ text structure (Duke

& Kays, 1998; Smolkin & Donovan, 2001). This section of the literature review will

present research which pertains to elementary readers' abilities and skills related to

reading expository text.

Many studies involving expository text involve instructional programs designed

to enhance elementary students' ability to comprehend expository text. Several studies

have explored the effectiveness of such factors as strategy instruction (Feldt, Feldt, &

Kilburg, 2002; McKeown et al.,1992), instruction on text structure (Hall, Sabey, &

McClellan, 2005; Williams, Hall, Lauer, Stafford, DeSisto, 2005), and the level of student interaction around texts (Dole, Valencia, Greer, & Wardrop, 1991). The current study,however, is not concerned with an instructional program, but rather with elementary readers' existing knowledge and skills related to reading exposition, specifically persuasive exposition. Therefore, instructional studies, while they have found important factors which help young readers develop skill related to comprehending expository text, will not be highlighted in the current review.

Langer (1985) explored children's ability to differentiate between expository and narrative text. Specifically, she was interested in children's ability to read and write stories and science reports. Participants included 67 high-achieving students from third, sixth, and ninth grade. Students read two passages (one story and one report which told about a topic) and wrote in response to two prompts (one story and one informational). Half of the students were trained to engage in think-alouds as they read and wrote. The other half retrospectively reflected after reading and writing. Each student was asked to retell what the text was about after reading both texts.

The results show that as early as third grade, readers and writers make distinctions between stories and information text (Langer, 1985). The structure of the retellings as well as students' written products demonstrated that students at all three grade levels were able to differentially employ content, organization, structure, and elaboration depending on whether they were dealing with expository or narrative text. The third-grade students demonstrated less control over both types of text than their sixth- and ninth-grade counterparts. A noted difference existed between sixth and ninth graders' use and knowledge of informational text. The ninth graders were more adept at reading and

writing informational text than the sixth graders. The author noted that between the sixth and ninth grade, students demonstrated they knew more about informational text. The findings support the notion that third graders had some notion of expository text (the report) albeit less developed than the older readers. The researcher hypothesized that a lack of exposure to the expository text form in early grades limited the third graders' awareness of the report (expository) form.

Langer's (1985) statement that elementary students were not adequately exposed to expository text and, therefore, not given a chance to develop a clear conception of exposition, remains true today. Duke (2000) found that despite scholars' calls for the inclusion of expository text in elementary school, there remains a scarcity of attention to and inclusion of exposition in the primary grades. In 20 first-grade classrooms, Duke collected descriptive information about the experiences students had with exposition four full school days throughout the year. Results show that very little informational text was included in the first-grade classroom environments and activities. Despite the seemingly scarce presence of expository text in elementary school, students as young as kindergarten and first grade have demonstrated that they have the capabilities to interact and learn from expository text (Donovan, 2001; Duke & Kays, 1998; Smolkin & Donovan, 2003, 2001).

A recent survey conducted by Yopp and Yopp (2006) found similar results to Duke (2000). These researchers sought to expand upon our understanding of young children's exposure to expository text in and beyond the classroom environment. Specifically, surveys were sent to preschool through third-grade teachers as well as to children's home environment to explore the prevalence of information book read alouds.

Data from 1,144 preschool through third-grade teachers and 20 parents indicate that children are exposed to narrative much more often than information text. Additionally, boys were exposed to information text more often than girls. Yopp and Yopp's (2006) study further supports the finding that children are not adequately exposed to expository text in school or home environments.

Duke and Kays (1998) sought to support researchers' call for the inclusion of expository text in early grades by exploring whether kindergarten students were able to process expository text. These researchers studied what young readers know and can learn about expository text. Participants were 20 preliterate kindergarten students. Observations took place at two points, September and December. In September students had just entered kindergarten and in December students had been exposed to information book read-alouds on a daily basis for 3 months. The researchers asked the participants to engage in pretend readings of wordless information books as a means of assessing their knowledge of information books. In September, readers' 'readings' contained few of the key features of informational text. In December though, their 'readings' contained far more informational book language. This study illustrates that early elementary students have the capacity to acquire knowledge about information books.

Donovan and Smolkin (2002) explored elementary students' knowledge of narrative and information text. Students from kindergarten to fifth grade were asked to define, read, and produce narrative and information text. The researchers sought to understand the effects of particular scaffolding structures on children's production of narrative and informational text. Two children (one boy and one girl) were selected from twelve K-5 classrooms (two classrooms per level) for a total of 24 participants. An

important limit in this study was that "mainstream" students were selected, because of

their relative experience with and preparation for schooled literacy.

The primary goal of the design of this study was to include a wide variety of tasks

in order to add to the research base on children's knowledge of the two text types. Six

tasks were used to allow students to demonstrate their knowledge:

1. Students were asked to write a story and an informational text;
2. Students were asked to describe the differences between writing a story and informational text (primary grades did this task orally and grades 2-5 wrote their responses);
3. Students were then asked to "read" wordless narrative and informative texts orally;
4. Students were asked to define story books and informational books;
5. Students categorized a variety of books into either narrative or informational genre; and,
6. Students took the texts they had produced in the first task and engaged in a modified think aloud reflection about their thought processes and considerations when writing each genre.

Developmental differences were found for both types of text on the majority of

tasks. Fifth-grade students were able to provide the most detailed, accurate definitions, as

well as produce, categorize, and reflect on their writing of both narrative and information

text. Students were better able to explain their criteria for categorizing a text as narrative

or informational as they aged. In addition, students were able to produce narrative and

information text which included genre specific macro- and micro-level elements.

Production of each text type was deemed developmental and improved with age. As

children aged, they were more able to accurately articulate the differences between

narrative and information text with some exceptions discussed below.

This developmental pattern was not repeated when student talk about both text

types was analyzed at the first and second grade level. Participants were asked to provide

a definition of each text type as well as to categorize several books as either narrative or

informational. First graders were more adept at stating a definition of narrative than their second-grade peers. Three of the four second graders stated that an information text was *about* a topic, so they were able to provide an unsophisticated description of information text. However, second graders were not able to provide particularly sophisticated details about either narrative or information text. One hypothesis offered by the authors about why first-grade students provided more explicit definitions of the texts deals with a cognitive shifts which occurs as students learn more about a type of text. Between the ages of 5-7, more complex structures and reasoning emerge, thus making it difficult to articulate a clear definition about a type of text. In other words, second graders may have become aware of exceptions and the complexity of the type of text, making one concise definition hard to articulate. Interestingly, the inconsistency seen in the developmental nature of students' talk about narrative and information text was not demonstrated in students' writing. Second graders produced narrative texts which better aligned with the elements of narrative than first graders. While second graders may have struggled to clearly define narrative, they were able to produce a more accurate narrative text.

In addition to K-5 students' knowledge of information text, of particular interest to the current study was that some students in grades 3-5 clearly stated a dual purpose for the texts they wrote. During think-aloud interviews after they produced the texts, third-through fifth-grade students noted that their aim or purpose was an important consideration as they wrote. These older students noted that some stories and informational text were written with the aim of persuading the audience. The recognition of the duality of purpose (to inform and persuade) became more pronounced from one grade to the next. While informational text had been previously described as persuasive

in nature (Chambliss, 2001) the children's astute observations regarding author's purpose reveal a complex understanding of genre and text. In addition, the aim and purpose of the author have been mentioned as important considerations in the analysis of text (Kinneavy, 1977; Swales, 1990). Overall, this cross-sectional study supports the idea that genre knowledge increases as one develops.

Englert, Heibert, and Stewart (1988) studied the comprehension monitoring abilities of third- and sixth-grade readers while reading expository text. A total of nine passages were written; each passage consisted of five sentences. Three types of expository text structure were studied: sequence, enumeration, and compare and contrast. Each of the three text structures were written with three different types of inconsistencies: reader-based (information was inconsistent with readers' knowledge of the world), text-based (information was inconsistent with specific details of the preceding text), or text structure-based (information was consistent with the topic but incompatible with the prevailing text structure).

Subjects included 69 third graders and 65 sixth graders. Students were asked to read each text and act as an editor. After reading each text the reader answered 'yes' or 'no' to the question: "Does everything make sense?" Readers were then prompted to indicate what they would change if something did not make sense in the text. Readers' ability to recognize an inconsistency in the passage and make changes to the text to fix the inconsistency was scored using a rubric.

Results indicated that readers at both grade levels found it difficult to detect and correct inconsistencies in expository text. Older readers and those students who were better readers were more successful at detecting inconsistencies than younger or poor

readers. Of the three types of inconsistencies, text structure inconsistencies were the most difficult for all readers to detect and correct. Reader-based inconsistencies were slightly more difficult for readers to detect than text-based inconsistencies. Students may have had less prior knowledge about the topic or the factual, authoritarian nature with which expository text is presented may have made readers less confident in their own knowledge. Readers also may not have made the connection between their prior knowledge and experiences and the expository text. In addition, the authors note that expository text structures place more cognitive demand on readers. This increased cognitive demand of expository text structure may have left less of readers' attention available for active processing and relation to prior knowledge. The cognitive demand required for text structure sensitivity supports the finding that readers had the most difficultly detecting and correcting text structure inconsistencies.

Overall, readers found text structure inconsistencies the most difficult to recognize and correct, indicating an overall weakness in readers with regard to text structure (Englert et al., 1988). The author's conclude with a call for instruction in expository text structures as well as comprehension monitoring strategies. This study indicates that young readers were not overly skilled at recognizing reader-based, text-based, or text-structure based inconsistencies in expository text. This may indicate that instruction surrounding the many factors of expository text would benefit young readers. The structures of expository text included in the Englert et al. (1988) study may also inadequately trigger readers' prior knowledge on the topic and therefore limit readers' ability to process text. In conclusion, this study illustrated that students were not overly adept at monitoring or correcting inconsistencies in expository text. As readers aged they

were more able to detect and correct certain types of inconsistencies. However, much more remains to be understood about elementary readers' facility with reading exposition.

Kamberelis (1999) explored elementary students' knowledge of narrative, scientific, and poetic genres. Fifty-four students in kindergarten to third grade wrote texts representing each of the three genres above as a means of demonstrating their knowledge of each. In addition to the written texts, students provided oral justifications for why each of the texts they produced fit the given text type. Of particular interest to the current study is that participants had significantly more experience with narrative text and possessed more working knowledge of narrative. As seen with Duke (2000) and Donovan and Smolkin (2002), elementary students demonstrate more knowledge of narrative text because they are exposed to narrative more often. The increased exposure to narrative text translates into more experience with and knowledge of narrative text. Another finding in Kamberelis' (1999) study was that students possessed more knowledge of macro-level text features such as text structure than micro-level features such as coherence. Students' awareness of text structure and ability to recognize such text features is the focus of the next section.

The studies reviewed in this section illustrate that elementary-aged readers are able to identify, process, and comprehend expository text. The ability to read and write expository text improves with age, as demonstrated in the studies reviewed. Readers' ability to recognize that they are reading exposition and the text structure employed may be crucial to their ability to comprehend expository text.

Text Structure

Chambliss and Calfee's (1998) work supports the notion that text structure is a critical component in a reader's ability to comprehend a text. Readers must detect linkages among information within the text as a means of making sense of the text. The extent to which a text helps the reader associate various sub-ideas within a text and presumably activate related schema may enable them to develop an overall understanding of the material and content of the text. Theorists have conceptualized the structure of text in two ways: (a) as the organization of ideas in a text or (b) as the organization of various sections within a text (Ball, 1992). Readers' ability to detect and use text structure to their advantage as they comprehend text has been the subject of research for decades. Can elementary-aged readers detect text structure?

Children have extensive experience with narrative text and as a result they possess a wealth of knowledge about the content and structure of stories (Donovan & Smolkin, 2001; Stein, 1983). Through repeated exposure at home and school and due to the fact that the structure of a story can often mimic the events of their lives, young children are familiar with the structure of narrative text. Based on their facility with narrative structure, children have the capability to internalize and recognize text structure. However, young readers do not get as much exposure to expository text (Duke, 2000; Yopp & Yopp, 2006) and as a result their knowledge of expository text structure might be limited.

van Dijk and Kintsch (1983) concentrated their research on how readers organize their mental representations of text during the act of reading. They studied the relationship between the structure of text and readers' schema. This theory rested on the

idea that readers have schema for various types of text which come into play during the reading process. This text schema helps readers decide which ideas within the text to attend to, based on their prior understanding of a particular genre. For instance, while reading exposition, readers may attend to facts contained within the text and use the illustrative examples an author uses to help them further understand the facts.

Meyer (1985) also viewed text structure as the logical organization of ideas in a text. Meyer's prose analysis relies heavily on the reader's ability to recognize and retain information from the text in the structure utilized by the author along with attention to the logic of the message and the content structure. The reader's ability to attend to structure differentiates expert readers from novices. For instance, the more the reader's mental model of the text paralleled the structure produced by the author, the more expert the reader was thought to be.

These text-based approaches to reading are all aligned with the notion that the text will influence the way a reader processes text. Through careful design of text, an author can impart information to readers with a specific purpose. More recent research on elementary students' reading of exposition has shown readers to be more able to detect such text characteristics as text structure. As with the earlier section on expository text, emphasis will be placed on reviewing research which explores children's natural ability to detect and utilize expository text structure. Instructional studies have illustrated the effectiveness of teaching second graders to comprehend compare-contrast text (Williams, Hall, Lauer, Stafford, DeSisto, & deCani, 2005), teaching expository text structure during guided reading to second graders (Hall, Sabey, & McClellan, 2005), and instructing fifth graders about the problem-solution structure (Armbruster, Anderson, & Ostertag, 1987),

to name a few. An important contribution of each of these studies is that they demonstrate that children as young as second grade can be taught to recognize and use expository text structures during reading and writing tasks. However, what do elementary readers know about text structure without instruction?

Hare, Rabninowitz, and Scheible (1989) examined the influence of text features on students' ability to comprehend the main idea of text. Participants included 75 fourth-grade, 78 sixth-grade, and 107 eleventh-grade students. The texts used in the first study consisted of: (a) contrived texts from a basal reader and (b) naturally occurring texts from science or social studies texts books. The contrived text was written in a simple list structure in which the main idea was clearly stated at the beginning of the text. In contrast, the main idea in the naturally occurring text was often embedded in a more complex structure which also contained information which did not apply to the main idea. Results show that readers were more adept at locating the main idea in the contrived texts than the naturally occurring texts. Developmental differences in identifying the main idea were evident. Fourth-grade readers were the least proficient at identifying the main idea while eleventh-grade readers were the most proficient.

In a second study, Hare et al. (1989) examined students' ability to identify the main idea of texts written in four expository text structures: list, compare/contrast, cause/effect, and sequence. Identification of implicit main ideas was difficult across participants and text structures. Explicit main ideas were identified more readily by all readers across text structures. Readers had more difficulty identifying the main idea of texts structured in the cause/effect and compare/contrast structures than in the listing and sequence structures. Developmental differences varied by text structure. For the listing

and sequence texts, the sixth- and eleventh-grade students outperformed the fourth-grade students, but not each other. On the compare/contrast texts, the eleventh-grade readers outperformed the sixth- and fourth-grade readers. On the cause/effect texts, all readers were equally ineffective at identifying the main idea. These two studies illustrate the developmental differences which exist in the influence of expository text structure on comprehension as well as the differential influence various text structures have on readers.

Williams, Hall, and Lauer (2004) found that children as young as second grade were sensitive to text structure, much like the findings of Donovan and Smolkin (2002) and Kamberelis (1999). Williams et al. (2004) had second graders read two texts written in a sequential structure; one narrative and the other a historical textbook selection. The topics of the two texts were believed to be of varying familiarity to readers. Readers were asked to summarize the texts. Then readers were asked four structure questions related to information in the text. Readers were asked to summarize the text again, to see whether the structure questions would help them include more important information in their summaries. Attention to text structure helped these readers identify more important information from both the familiar and unfamiliar texts. Significant differences existed between participants' facility with the narrative and history textbook passage. The authors conclude that the significant differences between the two texts illustrates that children as young as second grade are sensitive to text structure.

Of particular relevance to the current study, Chambliss and Murphy's (2002) studied fourth and fifth graders' ability to represent the argument structure of text. This study explored fourth and fifth graders' ability to represent the global discourse structure

of argument as represented by Toulmin (1958) which includes a claim, evidence, and warrants.

Sixty-five fourth and fifth graders read one of three passages on various topics about Maryland written in the argument structure. Each passage contained a claim supported by data and tied together by various warrants. After reading one of the texts, students were asked to write responses to the following questions: "What is the author's main idea?" and "Write down as many of the author's supporting details as you can." Responses to the first question were analyzed to see whether participants stated the main idea in the form of a claim, which would indicate that students' detected the global argument structure. Students' responses to the second question were placed in graphic organizers which corresponded with the organization of students' response. In general, students either responded using an argument representation, topical net, list, or no organizational pattern.

Overall, students either represented the argument text in an argument structure or a topical structure. The majority of students utilized some type of hierarchical structure in their written recall. Most students employed a topical net structure to organize their text recall while some used an argument structure. As the authors point out, the textbooks students are generally exposed to were written in a topical net structure and therefore this structure is more familiar to students than the argument structure. Fifth graders were more likely than fourth graders to use the argument structure, suggesting a developmental difference in ability to use argument structure. Of particular interest to the current study is fourth and fifth graders' ability to employ some hierarchical discourse structure in

recalling text. More specifically, some students' ability to recognize and utilize the argument structure illustrates elementary students' facility with argument text structure.

Elementary-aged readers' ability to recognize and apply text structure has mixed reviews. Instructional programs illustrate that children as young as second grade are able to be taught to recognize text structure as a means to improve their comprehension (e.g. Armbruster et al., 1987, Hall et al., 2005, Williams et al., 2004, Williams et al., 2005). Cognitively, children as young as second grade can be taught to utilize text structure to help comprehension of expository text. Children's natural ability to recognize and use text structure is developmental and varies by structure. Children as young as second grade are sensitive to text structure (Williams et al., 2004). Chambliss and Murphy's (2001) study is of particular interest to the current study, because it illustrates fourth and fifth graders' ability to recognize some hierarchical form of an argument structure without instruction.

Persuasive Text

Several characteristics have been found to make a text more persuasive (Petty & Cacioppo, 1986). Specifically, highly persuasive texts should: (a) be written in a coherent manner, (b) present sufficient evidence to support the central claims, (c) effectively address and refute viable counter-arguments, (d) rely on credible evidence or authorities, and (e) evoke an emotional response in the reader (Chambliss & Garner, 1996; Stiff & Mongeau, 2003).

This section will examine three text structures which have been perceived as persuasive by adult readers. The aim of the current study is to explore the influence of text structures on fifth graders' reading of persuasion. The section examines text

structures that have been considered persuasive including argument structure (Toulmin, 1958), refutation, and explanation.

Argument structure. The structure of an argument is an important determinant of its effectiveness. The argument structure most commonly used in research is based on the work of philosopher Stephen Toulmin (1958). Unlike his contemporaries who focused on logic and mathematics to determine the ideal argument structure, Tolumin integrated the real world into his conception of an ideal argument structure (Chambliss & Garner, 1996). Toulmin felt the incorporation of factual information with instances of real-life connections would help convince the audience.

Toulmin's (1958) argument structure was not intended to apply to written arguments, but van Dijk and Kintsch (1983) proposed that the model be extended to written text structure. The model was put to use to characterize the structure of written argument and later adopted as the argument schema used by readers to comprehend a written argument or persuasive text.

According to Toulmin (1958), an argument consists of a claim, evidence, and a warrant. A *claim* is an assertion stated with the purpose of focusing the attention or beliefs of the audience. An example of a claim would be: Smoking is harmful to your health. *Evidence* is the set of facts or examples offered in support of a claim. Several pieces of evidence may be included as a means of supporting the claim that smoking is harmful to your health: smoking causes several forms of cancer, causes several lung diseases, increases your likelihood of heart disease, and limits your lifespan. Claims are super-ordinate in relation to evidence. A claim that smoking is harmful to your health is more general and summarizes all the evidence presented. Competent readers use the

relationships of super-ordinate and sub-ordinate to identify an argument's claim and distinguish it from the evidence (Chambliss, 1995).

Warrants serve as the rules, principles, or foundation upon which the claim and evidence stand. Warrants are questions of law, while evidence can serve as questions of fact (Toulmin, 1958). While evidence helps to support a claim, the warrant sets forth the standard that is being applied to the claim and evidence. The purpose of a warrant is to state the legitimate or widely accepted step the audience is being asked to rely upon as they follow the logic of the argument. Therefore, Toulmin (1958) asserted that warrants were similar to canons and are designed to answer the question- "How did you get there?" (p. 98). Consider the smoking example once again. Smoking is harmful (claim) since it causes fatal diseases such as lung cancer (evidence). Any action that causes death is harmful (warrant). A warrant serves as the foundation for the evidence and claim as a means of supporting the argument.

Warrants are an elusive yet important element of the argument model (Anderson, Chinn, Chang, Waggoner, & Yi, 1997; Chambliss, 1995). Warrants do not always need to be explicitly stated in arguments. The obvious nature of a warrant often leads an author or speaker to omit a warrant. It may be clear that an action that causes death is harmful, so there may be little use in explicitly stating such an obvious principle. Aristotle discussed an enthymeme, which is a reasoned argument that includes two of the three elements of an argument (e.g. claim, evidence, and warrant) (Cooper, 1932). According to Aristotle, an argument can be logical and reasoned even if one of the three elements is missing (i.e.- the warrant is not explicitly included). An enthymeme only works if the audience is able to fully understand the argument's logic once the element is omitted. Warrants need to be

clear to the intended audience, whether implicit or explicit, so they know the stance of the author or speaker. An author or speaker cannot take for granted that the intended audience adheres to or is aware of the principle or law (warrant) upon which the argument is based. The inclusion of warrants in argument structure makes clear to the reader the foundation upon which the author of the text is relying upon to present the evidence to support the claim.

In addition to the structural components of claim, evidence, and warrant, Toulmin suggested three additional structural components of argument: backing, rebuttal, and qualification. *Backing* functions in a supportive strengthening role for the claim, evidence, and warrant in the form of elaboration. Backing for the smoking argument might include the various lung diseases smoking has been linked to as well as survival statistics for those diseases. *Rebuttal* or counterargument anticipates the resistance of the reader and counters that resistance. A counterargument often takes the form of a claim which is presented and related by a warrant to a whole set of evidence in contradiction to the first argument. With the smoking example, a counter argument might be that smoking in your teens and early twenties, as long as you quit, will not negatively affect your health. Counter-arguments are important components of arguments because they allow the author to address the opposing side and then discount the counter-argument. A *qualification* is designed to convince the reader to accept the first argument in spite of the second (counterargument) either by showing the superiority of the first argument, or qualifying it in light of the second argument. Continuing with the smoking example, the presentation of the counter-argument that smoking is acceptable as long as smokers quit by their thirties is important to rebuff. However, as a qualification, it would be important

for the author to clearly illustrate that although it is preferable to never begin smoking, those who do smoke should quit as soon as possible. Therefore, the author includes the qualifier so that those individuals who already smoke do not think, "Oh well, the damage is already done, might as well keep it up." Instead, the qualifier explains that if you're already a smoker, you can quit and your body can reverse many but not all of the damage smoking has already done.

Evidence supports the idea that children between 4- to 5 years-old know that an oral argument consists of asserting and defending a point of view (Stein & Miller, 1991). Therefore, children possess the logic associated with basic argument in that they understand that an argument supports a point of view as well as the fact that both sides have support. By the age of 12, children have demonstrated the ability to support their claims with multiple reasons as well as present counter-arguments (Golder & Coirier, 1994; Weiss & Sachs, 1991). As shown in a study reviewed earlier, elementary students are able to represent comprehension of an argument text by representing the argument structure (Chambliss & Murphy, 2002). While children have been found to produce and use argument structure, do they find it persuasive?

The argument structure proposed by Toulmin (1958) has been widely regarded as the structure to use when crafting persuasive messages. Through the clear statement of a claim and the careful use of evidence and warrants, the author makes his case. The persuasiveness of this structure has come into question with adults (Chambliss & Garner, 1996) and the same might hold true for younger readers. Other text structures have been proposed as equally persuasive as argument structure. Refutation text, reviewed in the next section, has been studied extensively in conceptual change research and has been

found effective in altering readers' misconceptions (Allen, 1991; Dole, 2000; Guzzetti, 2000; Guzzetti, Snyder, Glass, & Gamas, 1993; Hynd, Alvermann, & Qian, 1997; Hynd, McWhorter, Phares, & Suttles, 1994).

Refutation text. Conceptual change research has sought to address learners' commonly held misconceptions and to find viable ways to replace those misconceptions (Dole & Sinatra, 1998). Conceptual change is viewed as having many of the same goals as persuasion because the purpose is to convince the learner to abandon misconceptions and adopt more conventional conceptions (Dole, 2000). Conceptual change research has focused on exploring which text characteristics encourage readers to abandon or alter their naïve understandings for accurate scientific ones. One type of text in particular, refutation, has been found to impact readers' misconceptions.

There are several types of refutation text, but broadly, refutation text directly refutes a commonly held misconception. Generally, three types of refutation text have been explored: one-sided nonrefutation, two-sided nonrefutation, and two-sided refutation. *One-sided non refutation* text "presents only those arguments in favor of a particular position" (Allen, 1991, p. 390). *Two-sided nonrefutation* text presents two opposing arguments about the same topic, but does not include a refutation to either argument (Allen, 1991). *Two-sided refutation texts* "mention counterarguments to the position advocated and then refute them" (Allen, 1991, p. 393). Therefore, two-sided refutation text is designed to introduce counterarguments to the first argument, but then to demonstrate the superiority of the first argument in light of the inferiority of the counterarguments. In presenting refutation, the author would take a stance on the issue

and debunk the counter argument. The author would need to clearly take a stand and refute the opposing counter arguments.

The importance of the refutation portion of the text is supported by conceptual change research. Researchers have found that refutation texts invoke more change in altering non-scientific intuitive concepts to more scientific ones than reading nonrefutation text (Alvermann & Hynd, 1989; Hynd et al., 1997; Hynd et al., 1994). A meta-analysis of studies using refutation text in reading or science supports the notion that two-sided refutation text produces robust conceptual change (Guzzetti et al., 1993). The meta-analysis also found that reading nonrefutation text, which the authors say is the form most often found in science text books, was no more effective in altering conceptions than doing an unrelated activity. This conclusion is consistent with the idea that reading nonrefutation text is ineffectual at conceptual change. While reading may cause cognitive conflict, it may not be sufficient to foster conceptual change (Guzzetti et al., 1993).

One explanation for the effectiveness of refutation text in replacing misconceptions is that presenting a common science misconception may provoke readers' background knowledge (Hynd et al., 1994). The invocation of their background knowledge may encourage readers to reflect on the conflict between their intuitive ideas and the scientific concepts presented. Additionally, refutation text directly states that the misconception is incorrect, therefore the prior knowledge readers' activated is labeled as incorrect. For example, a text used frequently by Hynd and Alvermann (e.g. Alvermann & Hynd, 1989; Hynd et al., 1997) focuses on projectile motion and the impetus theory. The impetus theory held that an object propelled through space had an internal force

causing the motion. For instance, if a cannonball was shot out from cannon, it would continue in an arched path until it hit the ground because the force had been "used up". The idea that some internal force was driving the cannonball and that once that internal force was gone the cannonball would fall was later proven incorrect by Newton. In fact, Newton proved that a body in motion will stay in motion, though the external force of gravity pulls the cannonball toward the ground at a constant rate causing the arched path. A refutation text would state the common misconception of the impetus theory and then explain why Newton's ideas are correct. Activation of readers' possible misunderstanding of projectile motion may involve them in adopting the new conception. In addition, the directness of addressing a common misconception and alerting readers to the fact that it is incorrect may be explicit enough for readers to reject their old notion and accept the new.

Despite the apparent effectiveness of refutation text, there are those within the science community that feel that allowing students to experience "first-hand" the phenomena at issue would encourage more conceptual change than reading refutation text (Guzzetti et al., 1993). Conceptual researchers acknowledge that reading alone is often not enough to change non-scientific conceptions to scientific (Guzzetti, 2000). Oftentimes, the refutation text is accompanied by one of several instructional variables such as small group or teacher-led discussion of refuted concepts or demonstration, which work in conjunction with the text to accomplish conceptual change. With pre-service teachers, Hynd et al. (1997) found that a demonstration combined with reading refutation text was the most effective at changing conceptions. However, reading refutation text had the most effect on changing conceptions in the long term.

One limitation in the research on the effectiveness of refutation text is that the majority of the subjects are older. Most studies have utilized pre-service teachers or undergraduates as participants (e.g. Alvermann & Hynd, 1989; Hynd et al., 1997) while some have used high school students (e.g. Guzzetti, Williams, Skeels, & Wu, 1997; Hynd et al., 1994) and middle school students (Dole, 2000). Much remains to be understood about the potential effectiveness of refutation text with elementary readers. Refutation text is persuasive enough to convince older readers to abandon their preconceived notions, but it is not clear if the same would hold for elementary readers.

Explanation text. Another type of text that has emerged as potentially persuasive is explanation. Explanation is written to fill gaps in the readers' understanding of a particular topic or phenomenon (Chambliss & Calfee, 1998). Explanation has much of the same goals as refutation text. Explanation addresses gaps in readers' understanding through various examples and sub-explanations. For example, an explanation text might frame a shark's predatory nature as similar to human behavior. The author might ask the reader to think of a time she was really hungry and to visualize a delicious pizza. The author would then ask the reader to think about what happened. Did your stomach growl? Did your mouth water? How might you have felt if you saw it and then it was taken away and you weren't given anything? The point of this example is to encourage the reader to relate to how a shark might feel as it hunts for prey. Through tapping what the reader has experienced in the past, the author helps the reader relate to the information and begin to bridge the gap between what she may have experienced and what the shark might experience.

The main goal of explanation text is to explain a particular phenomena or concept by linking the information in the text with what the reader may already know or experienced. Through careful consideration of the intended audience, the author breaks information into examples and sub-explanations the reader can relate to. Effective written explanations present sub-explanations of examples, analogies, models, and information logically ordered to bridge gaps between readers' understanding and new understanding (Rowan, 1988, 1990). Authors must keep readers in mind as sub-explanations are chosen and order those sub-explanations in a way that will make sense to the reader. Rowan (1990) asked undergraduates to compose explanations about light refraction for fifth-grade readers. Those undergraduates who composed effective explanations possessed more background knowledge, text knowledge, and social cognition measures than the less successful writers. Therefore, the writers had to keep the reader, text, and topic in mind as they composed.

The composition of explanations has been shown to be a potentially powerful tool that encourages elementary students' understanding and reasoning of scientific concepts. Chambliss, Christenson, and Parker (2003) gave 20 fourth graders the task of composing explanations about the effect of pollutants on an ecosystem for third-grade readers. The fourth graders had completed a science unit on ecosystems as well as a unit of instruction in reading and writing explanations. Many of the explanations the fourth graders composed included content learned in the science unit (topic knowledge), rhetorical devises such as transitions to make the text clear to a reader (text knowledge), as well as personal pronouns to connect with their readers (reader knowledge). An additional reader consideration used by the fourth graders, which was not part of instruction but was

included in an example they read, was a narrative sub-explanation. The inclusion of the sub-explanation may be a further attempt to meet readers' anticipated needs because perhaps the fourth graders found it helpful as they read. Chambliss et al. (2003) asserted that the writers had to engage the topic, text, and reader at a deep level, thus encouraging a level of understanding and reasoning about an important science model.

Considering that persuasive text is often found to be relatively unsuccessful at persuading readers, (Chambliss, 1994; Chambliss & Garner, 1996) the engagement that explanations provide to the reader may persuade readers. It has been suggested that one reason persuasive texts fail to persuade is that readers process these texts superficially (Chambliss, 1994). Readers are not thinking deeply enough about the evidence and claims contained in a persuasive piece; instead, they engage in case-building actions which seek support for their initial beliefs (Nickerson, 1991).

Text structures that relate to readers' prior understanding or conception of a topic may be more engaging and, therefore, more persuasive. Since explanation taps the knowledge and experiences readers bring to the task of reading, it could encourage readers to engage the text on a deep level and think about the topic. The deep engagement with text and the topic may encourage critical thinking about the topic and potentially persuade. The design and structure of the text may encourage a higher level of thinking in the reader and, consequently, influence the persuasion process.

In conclusion, text plays an integral role in the comprehension process (RRSG, 2002). The current study is concerned with text type and text structure. Specifically, can elementary-aged readers comprehend expository text and are they sensitive to text structure? The research reviewed in this section states that:

- Children as young as kindergarten are able to comprehend expository text and differentiate between expository and narrative text (Donovan & Smolkin, 2002, Duke & Kays, 1998; Kamberelis, 1999).

- As readers age, their comprehension and knowledge of expository text increases (Donovan & Smolkin, 2002, Englert et al., 1988, Langer, 1985).

- Elementary-aged readers are also sensitive to text structure to varying degrees. Readers as young as second-grade have been found sensitive to text structure (Williams et al., 2004), so they are aware of the difference but their facility with it is not clear (Hare et al., 1989). Fourth- and fifth-grade readers are able to discern some discourse structure of argument text (Chambliss & Murphy, 2002), which is of importance to the current study.

- In addition to argument structure, texts which engage the reader at a deeper level have been proposed as persuasive. Refutation and explanation texts are two text structures which are potentially persuasive.

<div align="center">The Activity or Purpose for Reading</div>

The third factor the RRSG (2002) stated as important in reading comprehension was the activity or purpose. This study is concerned with the purpose of persuasion and the text and reader factors which facilitate persuasion. As reviewed in the previous chapter, the view of persuasion which informs the current study is a multi-faceted view of persuasion. As the summary of the multi-faceted approach to persuasion explained, an individual's knowledge, beliefs, and interests are influential in adults' persuasion process (Alexander et al., 1998; Buehl et al., 2001; Dole & Sinatra, 1994, 1998; Murphy, 1998). The transaction between reader and text is regarded as integral to persuasion. Persuasion

literature has historically viewed the persuasion process from either the vantage point of the reader or text, but recent work attempts to look at these two as interactive entities. In keeping with the RRSG's (2002) view of reading comprehension, the purpose, in this case to persuade, is another important factor in the reading comprehension process.

Persuasion

Several studies have explored the transactions between adult readers and text with the purpose of persuading. However, no studies have explored the role learner characteristics play with elementary-aged readers and persuasive text. The studies and methods used in research with adult readers are explained below because they inform the design of the current study.

Murphy (1998) found that certain learner characteristics (knowledge, beliefs, and interest) make individuals more open to particular claims and arguments. In this study, 234 undergraduates' knowledge, beliefs, and interests relative to three naturally-occurring texts were studied. The three texts were read by all the participants and they responded to pre- and post-reading surveys.

Readers' topic *knowledge* was broken into two types of knowledge: perceived topic knowledge and demonstrated topic knowledge. Earlier studies indicated that perceived and demonstrated knowledge contributed differentially to outcomes (Alexander & Jetton, 1996). Readers' *perceived knowledge* was assessed using three 10-point Likert scales (one for each text). Readers were asked to indicate their knowledge about the topic by placing an X along a continuum that ranged from "relatively nothing" to "a great deal". The *demonstrated knowledge* measure consisted of four open-ended items per article (for a total of 12 open-ended items) that addressed key arguments or ideas in the

text. Readers were instructed to jot down any words, phrases, or sentences to show what they knew about each idea. These measures were scored using a rubric based ranging from a limited response (0-2 accurate idea units) to extensive (3 or more accurate idea units). These measures of topic knowledge were given before and after participants read the passages.

Topic *belief* measures consisted of 16 Likert scale responses. Five statements were generated for each article, and readers indicated their agreement with the statement by placing an X along a continuum that ranged from "strongly agree" to "strongly disagree". A total belief composite score was attained based on the sum of all five belief scores for each topic.

Finally, topic *interest* was measured using 13 Likert scales. Four related topics were chosen for each article and readers would indicate their interest level by placing an X along a continuum ranging from "very interested" to "not very interested". An overall interest score was obtained by summing the interest scores for each article.

One additional post-reading measure employed during the study was an article reaction. The measure included 6 Likert scales that assessed readers' beliefs about text characteristics. Those text characteristics that have been shown to be influential in persuasion (e.g. author credibility, text comprehensibility, and whether the reader found the argument persuasive) were included in the article reaction. Readers indicated their agreement with each text characteristic statement (e.g. "The article was interesting") by placing an X along a continuum ranging from "strongly agree" to "strongly disagree."

Murphy (1998) found that the persuasiveness of texts was closely tied to individual learner characteristics. Individuals with moderate levels of knowledge, beliefs,

and interest were more likely to experience an increase in their topic knowledge and

interest, as well as have their beliefs transformed to align with the author's stance. Those

with very high or very low levels of knowledge, interests, and beliefs were not as likely

to be persuaded as their moderate counterparts. Also, this study found that topic played

an important and different role for each individual. That is, students' profiles (knowledge,

interest, and beliefs) were different depending on the topic, which affected the degree of

persuasion. The same individual would demonstrate varying degrees of persuasion based

on the text topic and their knowledge, beliefs, and interest about the topic.

 Alexander, Murphy, Buehl, and Sperl (1998) sought to understand the interplay of

reader and text characteristics in adults as a means of creating a profile of those readers

who can be persuaded. They sought to answer two questions: (a) What are the profiles of

readers who are persuaded by what they read, and (b) What role does a reader's

educational level play in the persuasion process? The subjects included 37

undergraduates, 15 graduate students, and 10 faculty members. The texts were two

naturally occurring articles from *Life* magazine. One of the articles relied on pictorial

displays and factual information to support the claims. The other article included a

personally involving story which served as the central basis for the support of the

argument. Participants read both articles and completed written response tasks for each

before and after reading.

 The written response task was designed to provide insight about the effect of

reading a persuasive article on the readers' knowledge, beliefs, and interest. The reader's

beliefs related to the topic were gauged through response to a statement which stated the

premise of the article (e.g. "The federal government should move to legalize same-sex

marriage"). Participants indicated their position relative to this statement by placing an X on a 150 mm line with "strongly agree" at one end and "strongly disagree" at the other.

Readers' *interest* in the topic was indicated in a similar manner to the beliefs about the topic. Participants indicated how interested they were in the topic by placing an X on a 150 mm line with the continuum ranging from very disinterested to very interested.

Finally, as in the Murphy (1998) study, readers' topic *knowledge* was broken into perceived topic knowledge and demonstrated topic knowledge. To measure perceived knowledge, participants were asked "to indicate how much you think you know about" each topic prior to and after reading. Again, perceived knowledge was measured in a similar manner to the interest and belief measure, with a line where participants placed an X along a continuum of either "relatively nothing" to "a great deal." Finally, demonstrated knowledge was measured based on what participants stated they knew about the topic. Prior to reading, participants were asked "What background information or knowledge helped you form your position on this issue? In other words, tell us what you already know about this subject." After reading, participants were asked "What specifically did you learn from reading this article? In other words, what do you remember from this article?" The demonstrated knowledge responses were coded by counting the total number of accurate ideas recorded for each prompt thus providing a comparison point for demonstrated knowledge.

Alexander et al. (1998) found that knowledge played an influential role in the persuasion process. Those with higher perceived knowledge prior to reading were least likely to be persuaded. In contrast, those with the lowest stated levels of perceived

knowledge were more likely to be persuaded by what they read. Apparently, those

readers who did not perceive they knew a lot about the topic were more open to the

evidence and claims presented in the article and less biased by their own background

knowledge. In addition, those who reported being most interested and most in agreement

with the position of the author before reading were generally the most persuaded.

Additionally, education level seemed to play a role in degree of persuasion. In general,

undergraduates were most open to the persuasion process in light of their low levels of

interest prior to reading and their low perceived knowledge. This finding in particular

may be of interest to the current study in that persuasion may be a developmental

phenomenon. Younger readers may be more open to accept the authority of an author and

abandon their initial beliefs and knowledge however the effect of persuasive text on

young readers is as of yet unexplored.

　　　　Buehl, Alexander, Murphy, and Sperl (2001) conducted a study that integrated

text type into the exploration of reader characteristics and persuasive text. The methods

utilized in the study were similar to those used in earlier studies (Alexander et al., 1998;

Murphy, 1998). However, the texts that were used in this study included a one-sided text

and a two-sided nonrefutation text. Both of the articles were naturally occurring, however

the content of the texts, based on the conceptual change research, was thought to play a

role in the persuasiveness of the text.

　　　　Ninety-three undergraduates participated in the study. As with the earlier studies,

the participants were given pre- and post-reading response tasks that sought to measure

their topic knowledge (perceived and demonstrated), beliefs, and interest. Much like the

Murphy (1998) study, this study asked respondents to provide an overall article reaction on six characteristics of text found to be influential in persuasion.

Results of the study indicate differing responses based on the message characteristics (one-sided or two-sided nonrefutation). For each text, profile subgroups were created based on the readers' initial agreement with the author's stance (high, moderate, or low agreement). Buehl et al. (2001) found no significant differences for the one-sided text between interest or knowledge, regardless of beliefs or degree of persuasion. The majority of readers indicated that their initial beliefs were comparable to the stance taken by the author. The readers who indicated they agreed with the author strengthened their beliefs. Those readers who indicated their knowledge was higher were more likely to maintain or strengthen their beliefs than those readers who had lower perceived knowledge prior to reading. Those readers with strong beliefs and high knowledge were less willing to abandon their beliefs. To summarize, the one-sided text was more effective at altering readers' beliefs, whereas the two-sided nonrefutation text was more effective at altering readers' knowledge.

Finally, Murphy (2001) explored undergraduates' and experts' conceptions of persuasion. The basis for this study was an overall lack of attention in research to what students might judge as persuasive. There are many criteria upon which the literature suggests persuasiveness of text should be judged. Some suggestions within the literature include text characteristics (strength, content, and structure of argument), the credibility of the author or message, the comprehensibility of the message, and the emotional nature of the text. Notably, this was the first study to explore what students perceived as persuasive.

Three research questions guided the study: (a) What naturally occurring texts do undergraduate students find persuasive, and what criteria do they use to make such a determination? (b) To what extent do the evaluation of experts, relative to four naturally occurring persuasive texts, parallel students' judgments? (c) To what degree do the criteria that students and experts use to judge the persuasiveness of four naturally occurring texts mirror the explanations or justifications gleaned from the persuasion literature?

The study involved 195 college juniors as well as seven experts in persuasion and conceptual change. From a pool of 100 naturally occurring texts, the pool of texts was narrowed based on three criteria that needed to be included: the text focuses on a contemporary issue, presents a position or makes a claim, and includes specific evidence. Based on these criteria, the initial pool was narrowed to 21 naturally occurring texts. The study was based on four of those original 21 texts, the two texts that students deemed most persuasive and the two texts that students deemed least persuasive. However, all 21 texts were used in the response task with students. Prior to reading, students were divided into 39 self-selected groups of five members each. Each group received four articles to read. Through random block design, the 21 articles were distributed so that each article was read by seven or eight groups. Each group member completed an Individual Report based on the 4 articles they read. The form included three items. The first item asked students to rate the persuasiveness of the article based on a 5-point scale ranging from *unpersuasive* (1) to *extremely persuasive* (5). The second item was an open-ended question: "What do you see as the main point of this article? That is, what is the author's basic message?" The third item was also an open-ended question: "What were the

strengths of the article? In other words, what makes the article persuasive in your opinion?" Once the individuals completed their response forms, they met in their focus groups to discuss the overall persuasiveness of the four articles. Groups were asked to complete a Group Report which asked students to rank the persuasiveness of each article based on the consensus of the group using the same scale that was used in their Individual Report, which ranged from *unpersuasive* (1) to *extremely persuasive* (5). The Group Report also asked the group to explain their reasons for the ranking and the criteria they used to decide on each ranking. The outcomes of the group report were used to cross-validate the Individual Reports.

The experts read and judged the four articles that students rated as most persuasive (two articles) and least persuasive (two articles). Experts completed an Individual Report form, as described above, as well as an Overall Rating form that was similar to the Group Report. The Overall Rating asked the experts to rate the persuasiveness of the four articles and to explain the rationale for their decisions.

The two open-ended items were coded based on differing criteria. The students' answers to the first question, "What do you see as the main point of this article? That is, what is the author's basic message?" were coded in two ways: for accuracy and for readers' recognition of the text structure. The main idea statement was placed in one of three categories: (a) the main idea was stated as a claim or position statement (e.g. "AIDS is tightening its grip on the developing world-where the costly new drugs won't do much good at all"), (b) the main idea was a statement (e.g. the article is about AIDS in developing countries), or (c) the main idea consisted of a topic (e.g. "AIDS"). These categories were based on the premise that individuals were more likely to be persuaded if

they were able to identify the main idea as a claim and recognize the argument structure of the text (Chambliss, 1995; Chambliss & Murphy, 2002).

The students' answers to the second question: "What were the strengths of the article? In other words, what makes the article persuasive in your opinion?" were coded using content analysis. Four categories which mirror those articulated by Aristotle emerged based on student responses, (a) author, (b) emotion, (c) argument, and (d) evidence.

Results indicate that students and experts generally agreed in their ratings of the two most persuasive and the two least persuasive texts in some respects. The two most persuasive texts had several elements in common: (a) both provided personally involving stories to tap into readers' emotion, (b) both were two-sided refutation texts, and (c) both used nonscientific evidence to support the claim. In contrast, the two least persuasive texts were found to be two-sided nonrefutation and both dealt with scientific topics and evidence (e.g. reliance on scientific names).

Students and experts were able to identify the main idea of all four articles. The more likely the students were to identify the main idea in a claim or position statement, the more likely they were to deem the text persuasive. Overall, the main idea statements for the least persuasive texts were less likely to be placed in claim or position statement by both the students and experts, thus pointing to the apparent ambiguity of a claim or argument within those texts.

The most influential factor for both students and experts in determining the strength of text persuasiveness was the evidence presented in the text. The second pattern that emerged was that affect, emotion, and interest played an influential role in

determination of persuasiveness. The structure of the argument seemed to be reflected in the judgments of text in the absence of affect. If there was an absence of an emotional plea, adequate background knowledge, or personal dimension, the structure of the argument came more into play in decisions of persuasiveness. In addition, there were slightly nuanced criteria participants reported using to evaluate the persuasiveness of text. Texts that the participants deemed informative, well-written, or elaborated were often judged positively.

This study found several commonalities between students' perceptions of persuasion and the literature. For instance, students and experts agreed that text must be comprehensible. The clarity of the arguments and the credibility of the author were factors when the text lacked emotional appeal or substantive supporting evidence. The outcomes also identify criteria not identified in the literature that students and experts based their judgments on. Students and experts felt that texts must provide a variety of types of evidence to support the central argument, as well as evoke the emotions and affect of the reader in order to be persuasive. Overall, this study sheds light on the perceptions of adult readers as they process persuasive text.

In summary, there is not one text structure which has been identified as persuasive with adult readers. Instead, several structures could be considered persuasive with adult readers. In addition learner characteristics such as knowledge, interest, and beliefs have been found to be influential in adults' reading of persuasion. Little is known about the influence of children's learner characteristics on the reading of persuasion. In fact, little is known overall about elementary students' reading of persuasion.

This section highlights several implications for the current study:

- Reader characteristics have been shown to be influential in adults' reading of persuasion. Specifically, readers' knowledge, beliefs, and interest play an important role in the degree of persuasion.

- The reading of persuasive text and elementary-aged students' perceptions of persuasion and persuasive text is a neglected area of research.

Conclusion

This review of the literature illustrates a gap in understanding young readers' perceptions about persuasive text. In particular, learner and text characteristics have been found to be influential in the persuasion of adults, yet research has not focused on whether these characteristics are influential in young readers' perceptions of persuasion. The overall persuasiveness of text has recently come into question with adult readers, who tend to rely more on their knowledge, beliefs and interest in the topic than the validity or clarity of the text. Yet, the effect of these variables is unexplored with children as they read. If these characteristics were found to play a role in persuasiveness as children read, their approach to writing persuasive text might accommodate those issues as well. As it stands now, there is little attention devoted to what children regard as persuasive as they read.

This study explored the interplay of fifth-grade readers' learner characteristics (knowledge, beliefs and interest) and rating of the persuasiveness of texts. This exploratory study was the first to attempt to understand elementary students' perceptions of the persuasiveness of text. The next chapter describes the methods and data sources for the current study.

CHAPTER III

METHODOLOGY

This chapter describes the participants in the study and outlines the materials, instruments and procedures employed in data collection. Fifth-grade students completed a task in a small group setting as a means of exploring the interplay learner characteristics and fifth graders' ratings of the persuasiveness of text (See Appendix A, Research Questions and Data Sources). The task involved students reading two texts and responding to a series of continuous items similar to those used in previous studies (Alexander et al., 1998; Buehl et al., 2001; Murphy, 1998) to obtain quantitative data. In addition, four students were selected to participate in a retrospective verbal report following the reading of each text. The retrospective verbal report was designed to explore readers' reasoning; this qualitative data source supplements the statistical analyses presented in Chapter Four.

A pilot was conducted to determine the developmental appropriateness of the texts and instruments (See Appendix B, Highlights of Pilot Study). The pilot involved four fifth-grade students. The students read the texts and responded to the tasks that were eventually used in the study. Modifications to the interview protocol based on the pilot are explained within the materials and measures section.

Method

Participants

Fifty-two fifth graders (hereafter referred to as *readers*) participated in this study. Readers were recruited from a population of students who were either enrolled in a K-8 parochial school located in the Mid-Atlantic region or attended the after-school program

at the same school. Ideally, the number of readers who participated in the study would have included all the students enrolled in the fifth grade. However, only 39 of these 51 students returned signed consent forms (See Appendix C, Parental Consent Form). As a result, readers were recruited from the school's after-school program. The fifth graders enrolled in the after-school program attend the local public elementary school and, like the students from the parochial school, were a reflection of the diversity of the local community. A parental consent form was sent home with all fifth graders in the after-school program; 13 of these students returned signed consent forms.

The school is situated in an economically and ethnically diverse area. Four hundred-forty students attended the school during the 2005-2006 academic year, 210 of whom were girls. Table 1 contains demographic information for the school.

Table 1

School Demographic Information: Number of Students per Grade Level by Race

	PK	K	1	2	3	4	5	6	7	8	Total	% Total
American Indian	0	1	0	0	0	0	0	1	0	0	1	<1%
Asian	0	2	0	0	1	2	1	1	4	0	11	2.5%
Black	13	23	20	19	25	28	25	18	29	21	221	50%
Hispanic/ Latino	1	3	1	4	3	4	4	3	4	2	29	6.6%
Pacific Islander	0	0	0	0	0	0	0	0	0	0	0	0%
White	3	12	15	15	16	12	17	20	15	25	150	34%
Multi-racial	3	4	6	2	1	1	4	4	2	0	27	6%
Total	20	45	42	40	46	47	51	47	54	48	440	

The same demographic information was not available for the public school;

however, Table 2 contains demographic information of the 13 participants in the after-

school program. The after-school program is run by the parish and the director did not

want to violate participants' privacy and, therefore, did not share any information. She

did allow access to the fifth graders in the program and left participation completely up to

the parents.

Table 2

After-School Participants' Demographic Information

	Female	Male	Total
Asian	1	0	1
Black	3	2	5
White	2	5	7
Total	6	7	13

Fifth grade was chosen as the focus grade of the study for three reasons. First,

several studies of genre knowledge development in elementary school found that older

elementary students (5th or 6th grade) express their awareness of differences in genre

features better than their younger counterparts (e.g. Donovan & Smolkin, 2002;

Kamberelis, 1999). Based on those findings, fifth graders were deemed appropriate based

on other research which found that upper elementary students demonstrated awareness of

text differences.

Second, persuasive writing was a part of the fifth-grade language arts curriculum

at both the parochial school and the local public school system. According to curriculum

documents, each of the participants would have been exposed to persuasive writing in

earlier grades.

Third, the fifth-grade teacher at the school reported that all of her students read independently at a fifth-grade reading level. Reading level information about the after-school participants was obtained from a teacher at the parochial school who supervised the fifth graders after school. She was able to share her assessment of students' reading capabilities based on the fact that students completed homework and academic tasks as a part of the after-school program. This gave the teacher insight into the general literacy capabilities of the students.

Every step was taken throughout the research study to protect the identity of the participants. Each reader was given a unique code (i.e. 01-01) that consisted of two pairs of numbers. The first pair indicated the gender of the reader (01=female, 02=male). The second pair was the order in which the readers participated (the 37th reader interviewed was 37). Only the researcher had access to this information. The identities of the participants were kept in a password-protected file on the researcher's home computer. All written materials contain only the students' codes and no other personal identifying information.

Retrospective Verbal Report Participants

The purpose of the retrospective verbal report was to explore readers' reasoning about the texts after they read. Four readers were selected from the parochial school student sample to participate in the retrospective verbal report. The classroom teacher indicated which students would be comfortable speaking with an adult. From this group of students, the researcher randomly selected two girls and two boys for participation. Based on the fact that there was no teacher input available for the public school students, they were excluded from the retrospective verbal report pool.

Sean [all names are pseudonyms] is an African-American boy with two younger siblings who attend the same school. Sean was reading on grade level according to his teacher and expressed interest in reading about sports. Otherwise, he reported very little interest in reading recreationally. Hada is an Ethiopian-American girl whose parents are both natives of Ethiopia. Hada and both of her younger sisters were born in the United States and are bilingual. Hada's teacher reports that she was one of the top readers in the fifth grade. She is a very motivated reader who reported that she read a wide variety of fiction. Charlie is an African-American male with an older sister in the 8th grade at the same school. Charlie reads on grade level, according to his teacher, and expressed a clear motivation to read recreationally, especially fantasy books and animé. Lily is a Caucasian female student with a twin brother who attends the same school. Lily reported that she sometimes likes to read, but her teacher reported that she read on grade level and seemed to apply herself inconsistently to literacy tasks.

As described in the next chapter, the participants in the Retrospective Verbal Report reported various levels of learner characteristics. This heterogeneous sample of participants allows for exploration of a spectrum of readers' insights. The procedures for the Retrospective Verbal Report are explained in more detail in the next section.

Measures

The measures used in the study and described in this section include (a) two texts, (b) learner characteristics measures, (c) a persuasiveness rating scale, and (d) a retrospective verbal report protocol.

Texts

Based on a limited supply of naturally occurring persuasive texts at the fifth-grade reading level, the texts used in this study were created by the researcher. The texts were written in either argument or explanation structure. The argument structure is based on the Toulmin (1958) structure which includes claims, evidence, and warrants. The explanation structure is based on the work of Rowan (1988, 1990) and Chambliss and Calfee (1998). Explanations are structured with the reader in mind and aim to fill gaps in readers' understandings; they are organized in various sub-explanations in a logical order, based on assumptions made about the intended audience.

The texts were created to incorporate considerations associated with the research questions and relevant literature. Using a taxonomy developed by Chambliss and Calfee (1998), two texts were constructed. One text aligned with the argument structure and the other aligned with the explanation structure (See Appendix D, Texts). Both texts dealt with the topic of air pollution. Air pollution was selected as the topic for the texts for two reasons. First, previous years' science curriculum in both school systems included the topic of pollution. Second, the explanation version of the text was used in another study (Chambliss et al., 2003) with fourth-grade readers. For these reasons, it was assumed that the topic of air pollution might be familiar to readers and that fifth-grade readers could understand the topic since it had been used previously.

The texts were written and validated in the following way. First, a meeting was held with a literacy expert who has devoted much of her research to the study of text design and structure. During this consultation, a number of science explanation texts used in previous studies with fourth- and fifth-grade students were shared and analyzed.

Explanation, argument, and informative texts written on the topic of representative

government used in research studies involving high school students were analyzed and

discussed during this meeting as well. The texts used in other studies served as models in

the creation of the texts for the current study. Specifically, the length, language, and the

text features used (i.e. illustrations and subheadings) in other texts influenced the text

creation considerably.

Based on the argument and explanation structures described above, graphic

organizers were created for each text structure (See Appendix E, Graphic Organizers).

Once the graphic organizers were created, they were electronically sent to the literacy

expert as well as another literacy expert, both of whom are experienced in conducting

literacy research with elementary students. Both of these experts provided feedback

electronically which were influential in modifying the graphic organizers.

The graphic organizers were used to plan and compose the texts. The two texts

were sent to the two literacy experts for feedback concerning adherence to the text

structure, age appropriateness of the text and information, and overall coherence and

comprehensibility. Both experts provided numerous revision suggestions and several

series of electronic exchanges were involved in creating the texts that would later be used

in this research.

Information about air pollution was obtained using web-based research resources.

The U.S Environmental Protection Agency website (http://www.epa.gov/) served as the

primary source of information about the topic of air pollution. The information obtained

about air pollution from the website was modified for elementary-aged readers and

placed in the appropriate spaces within the graphic organizer. Additionally, the

information on air pollution in both texts was verified by a science education doctoral student who received her master's degree in environmental biology in 2001. The final versions of the texts are a product of the suggestions from all three experts and were ultimately approved by all three.

The explanation text (*The Air We Can See;* See Appendix D, Texts) is a modified version of a text that was used in another study by Chambliss and her colleagues (Chambliss et al., 2003). *The Air We Can See* explains how air pollution is formed and how it damages the atmosphere. A modification of the text was made to ensure the information paralleled the information contained in the argument text. A section was added which explained the steps that cities are taking to reduce air pollution.

The argument text (*The Dangers of Air Pollution*; See Appendix D) supports the claim that air pollution is a significant problem for each of us, yet it is a problem we can all take steps to reduce. Various pieces of evidence are presented in the text to support the claim. The warrant is not explicitly stated in the text. As explained in the previous chapter, an enthymeme, which includes two of the three elements of a reasoned argument, is still considered a viable form of argument as long as the audience, in this case the reader, is able to understand the missing element (Anderson et al., 1997; Chambliss, 1995; Cooper, 1932). In the argument text presented to readers, the warrant is implicitly stated in the text. The graphic organizer for the argument text includes the implicit warrant (See Appendix E); further, it was believed that the fifth-grade readers in this study would be able to infer the warrant.

The texts were presented to participants in a counterbalanced design. Readers were interviewed in pairs which usually consisted of one girl and one boy. One reader in

each pair read the argument text while the other read the explanation text. The presentation of the two texts was based on gender as an arbitrary means of varying the presentation of the texts. For instance, in Pair 1, the girl read the argument text first and the boy read the explanation text first. In Pair 2, the girl read the explanation text first and the boy read the argument text first. The texts were used during the pilot study and were found to be appropriate for fifth-grade readers (See Appendix B, Highlights of the Pilot Study).

Learner Characteristics

Numerous measures were designed to quantify learner characteristics before and after students read (See Appendix F, Student Response Sheet). Readers' perceived knowledge, demonstrated knowledge, beliefs, and interests concerning air pollution were measured before and after reading the two texts. Continuous response items were designed to measure readers' perceived knowledge, beliefs and interests. A 15-item multiple-choice questionnaire was designed to measure readers' demonstrated knowledge.

A continuous scale was constructed based on similar work with adults (e.g. Alexander et al., 1998; Alexander et al. 2001; Buehl et al., 2001). In contrast to the traditional Likert scale, this procedure allowed for a continuous measure of respondents' views. In order to gauge readers' perceived knowledge, beliefs, and interest about the topic, readers placed a mark along a 150 mm line to indicate their agreement with a particular statement. The point where the reader's mark intersected with the horizontal 150 mm line served as the reference point. A reader's score for each item was based on the distance of the reference point from the far left of the horizontal line as measured with

a ruler placed along that horizontal line. In cases where a reader's mark did not intersect with the horizontal line, the bottom point of the reader's vertical mark served as the reference point. The distance from the far left was based on the distance of the bottom of the mark when the ruler is held perpendicular to the horizontal line. In cases when a reader's mark was thicker than a millimeter, the beginning of the mark from the far left was used as the reference point. The distance of the reference point from the far left was measured in millimeters, with the distance rounded to the nearest millimeter.

This procedure for measuring the distance of a reader's mark from the leftmost side of the 150 mm continuum was used whenever a student was required to respond to a similar scale. The reliability scores for each measure are referenced below in the descriptions of each measure.

Perceived knowledge. Perceived knowledge is the amount of knowledge readers feel they possess in relation to the topic, in this case, air pollution. Readers' perceived knowledge before and after reading was quantified based on their response to one question:

"How much do you think you know about air pollution?"

Nothing   *A lot*

Readers placed a mark along a 150 mm line that ranged from "*Nothing*" to "*A lot*" to indicate their knowledge. The higher the number, as indicated by the distance of the point of intersection of the mark with the horizontal line from the beginning of the line on the far left, the more knowledge readers felt they possessed about air pollution. Readers' placement of a mark along the continuum showed their level of perceived knowledge, or

the amount of knowledge they thought they possessed about air pollution. Since there was one perceived knowledge item, no reliability score was calculated for this measure.

Demonstrated knowledge. Readers' level of demonstrated knowledge about the topic, or what they actually know about air pollution was measured. A 15 item multiple-choice measure was constructed as a means of quantifying readers' demonstrated knowledge about the topic (See Appendix F, Student Response Sheet). The demonstrated knowledge measure for this study was created by the researcher and was based on information obtained from various web-based resources, primarily the U.S. Environmental Protection Agency website: (http://www.epa.gov/). The information included in the measure included material found in one or both of the texts (See Appendix G, Text and Demonstrated Knowledge Correspondence). The veracity of the information in the measure was evaluated by the science expert.

Readers were instructed that if they did not know an answer they could skip the item. The items omitted were scored as incorrect. This measure was administered twice, once before reading and once after reading both texts. The possible scores for demonstrated knowledge ranged from 0-15. A scoring template for the 15 multiple-choice items was created by the researcher and verified by the science expert. Each question had four answer choices and only one of the answers was correct.

Using the Kuder-Richardson Formula 20, which measures the internal consistency of dichotomous items, the reliability scores of the 15 multiple choice demonstrated knowledge items were calculated. Several variables were calculated for each question, including the variance, sum of squares, and p and q values. The p value is the proportion of readers who got a particular answer correct. The q value is the proportion of readers

who got the answer incorrect. The reliability scores of the pre-reading demonstrated knowledge items were .499 and for the post-reading demonstrated knowledge items the reliability scores were .629 (See Table 3, Reliability Scores).

The low reliability scores for the pre- and post-reading demonstrated knowledge measures are not ideal; however, in the interest of maintaining the validity of the instrument all of the items were retained in the measure. As part of calculating the reliability score for each item, the p value of the item was multiplied by its q value, yielding a p-q value for each item. Items with high p-q value, whose removal would have raised the reliability score, were considered important because of their discriminating quality. The items with high p-q values were the items that around half (.5) of readers got correct. Therefore, those items with a high p-q value discriminated between those readers who possessed the knowledge and those who did not. On the other hand, those with a lower p-q value were either too easy or too difficult for readers and did not discriminate between those who knew the information and those who did not. The removal of the items with a low p-q value did not increase the reliability scores. In fact, the reliability scores decreased after removing the items with the low p-q values. In sum, despite the low reliability scores of both the pre- and post-reading demonstrated knowledge items, all 15 items were retained in the measure in the interest of construct validity.

Table 3

Reliability of Scores for Demonstrated Knowledge, Interest, Belief, and Persuasiveness

Rating Measures

Variable	Reliability Score
Pre-Reading Demonstrated Knowledge (15 multiple-choice items)	.499
Post-Reading Demonstrated Knowledge (15 multiple-choice items)	.629
Pre-reading Interest (6 items)	.754
Post-reading Interest (6 items)	.702
Pre-reading Beliefs with reverse-worded items (6 items)	.487
Pre-reading Beliefs without reverse-worded items (3 items)	.589
Post-reading Beliefs with reverse-worded items (6 items)	.633
Post-reading Beliefs without reverse-worded items (3 items)	.656
Persuasive Rating of Argument Text (8 items)	.816
Persuasive Rating of Explanation Text (8 items)	.823
Reliability Score of the Overall Measure	.897

Interest. Readers' interest in each topic was assessed by a six-item measure (See Appendix F, Student Response Sheet). This measure was administered before and after reading both texts. The interest items were behavioral and were designed to gauge readers' interest in the environment and air pollution based on their level of agreement with particular statements. For example, one interest item stated:

"I am careful to recycle items such as paper, glass, and plastic at home, school, or elsewhere."

Strongly disagree   *Strongly Agree*

Readers placed a mark along the 150 mm continuum to indicate their level of agreement with each statement. Readers' relative agreement with each statement was gauged by the distance of the reference point of their mark in millimeters from the far left end of the line. A score above the midpoint of 75 indicated that students agreed with the statement. These six items were designed to tap a variety of behaviors in which a person concerned about the environment might engage. Statements on the interest measure asked readers if they (a) watched television programs, (b) read about, or (c) would like to learn about environmental issues. Other statements asked if readers conserved (a) water or (b) electricity in their homes or if they (c) recycled.

A composite interest score was obtained for each reader by finding the mean interest score for all six items. If a reader skipped an item, the composite score was based on the remaining items. Composite interest scores for individual readers were rounded to the nearest whole number.

Using Cronbach's alpha procedure, which represents a model of internal consistency based on the average inter-item correlation, reliability scores for the interest items were calculated (See Table 3, Reliability Scores). The reliability of the pre-reading

interest scores was .754 and the reliability of the post-reading interest scores was .702. Overall, these scores fall in the average acceptability range for reliability scores (Pedhazur, 1997). For exploratory research, such as this study, a reliability score lower than .70 can be considered acceptable, but are not overly desired, (Hill & Lewicki, 2006) and these reliability scores are above that recommendation.

Beliefs. Readers' beliefs about the topic were measured based on their agreement with six statements that dealt with beliefs about air pollution (See Appendix F, Student Response Sheet). For example, one item read:

"The health of the environment is something that everyone should take steps to help."

Strongly disagree   *Strongly agree*

Readers placed a mark along a 150 mm continuum ranging from "*Strongly disagree*" to "*Strongly agree*" to indicate their level of agreement with each statement. Readers' relative agreement with each statement was gauged by the distance of the reference point of their mark in millimeters from the far left of the horizontal line. A higher score indicated that readers agreed with the statement. These belief items were designed to tap readers' beliefs concerning the environment and air pollution. Each of the belief statements were addressed in one or both of the texts. Statement content included: (a) there are steps individuals can take to protect the environment, (b) the health of the environment is something everyone should take steps to help, and (c) air pollution harms living beings.

Three of the six belief items were reverse-worded. These statements stated: (a) air pollution was solely caused by factories, (b) that the actions of regular people will not help environmental problems, and (c) that air pollution does not affect people's health.

Readers' relative agreement with each reverse worded statement was gauged by the distance of the reference point of their mark in millimeters from the far right end of the horizontal line.

A composite belief score was obtained for each reader by finding the mean belief score for all six items. If a reader skipped an item, the composite score was based on the remaining items. Composite belief scores for each reader were rounded to the nearest whole number. Reliability scores for the belief items were calculated using Cronbach's alpha procedure. The reliability of all six pre-reading belief scores was .487 and the reliability of all six post-reading belief scores was .630 (See Table 3, Reliability Scores). Overall, these scores do not fall in the average acceptability range for reliability scores (Pedhazur, 1997). For exploratory research, such as this study, a reliability score below .70 can be considered acceptable, although it is not optimal, (Hill & Lewicki, 2006) and these reliability scores are below that recommendation. Therefore, the reliabilities of the belief scores were deemed low and, therefore, were considered to be inadequate representations of readers' beliefs.

The reverse-worded items may have been a problem for these fifth-grade readers. Other studies have found reverse-worded items problematic for respondents (Weems & Onwuegbuzie, 2001; Williams & Swanson, 2001). In order to test whether the reverse-worded items were different from the non reverse-worded items, a paired sample t test was conducted since the same people were responding to the items over time (Pedhazur, 1997). The results of the t test indicate a significant difference between the reverse- and non reverse-worded items at pre-reading, $F(1, 51) = 5.55$, $p = .00$ and post-reading $F(1, 51) = 4.66$, $p = .00$. The t test found a significant difference in the means of the two types

of belief questions, which indicates that readers answered the reverse- and non reverse-worded items differently. Based on these results, as well as the documented problematic nature of reverse-worded items in other studies, the reverse-worded items were excluded from further data analyses.

As a result of excluding the reverse-worded items, the Cronbach alpha reliability of the pre-reading belief scores without the reverse-worded items was .589 and the reliability of the post-reading belief scores without the reverse-worded items was .656. While these scores are low, this research was exploratory in nature, which often translates into lower reliability of scores (Pedhazur, 1997). Additionally, with the exclusion of the reverse-worded items, only three items remain for calculation of the reliability scores which is a small number of items and can lead to lower reliability scores. Due to the exploratory nature of the study, the reliability scores of the belief items, while low, were deemed acceptable for data analysis.

Text Persuasiveness Ratings

In order to measure the readers' perceptions about the persuasiveness of the two text structures (argument or explanation), items similar to those used to quantify learner characteristics were created (See Appendix F, Student Response Sheet). As with the Learner Characteristics measures, readers indicated their opinions related to various aspects of text persuasiveness by placing a mark along a 150 mm continuum. For example, one item on the text persuasiveness rating measure stated:

"The evidence that the author used in the text seemed real and important to me."

Strongly disagree   *Strongly agree*

Readers were asked to either "*Strongly disagree"* or "*Strongly agree*" with each

statement. The same procedures for determining the reference point of a reader's mark

used with the learner characteristics items were employed for the persuasiveness items.

Readers completed eight items twice, once after reading each text. These items provided

a continuous measure of readers' opinions regarding the persuasiveness of each of the

texts.

The decision to construct and utilize continuous measures to explore the

persuasiveness of each text was based, in large part, on the pilot. During the pilot,

participants were asked to indicate which text they found more persuasive and explain

why. The either/or nature of this question did not elicit adequate information from the

pilot participants. The structure of the question allowed participants to select a text and

provide little justification for their choice. Despite the probing of the interviewer,

participants did not elaborate their answers adequately. As a result, a more structured

measure of persuasiveness was developed. This measure was designed to elicit readers'

opinions about the persuasiveness of both texts. Additionally, several specific items

related to persuasiveness (e.g., evidence, connection to what they already believe) were

probed explicitly.

The persuasiveness items were designed to be wide ranging as a means of

gauging readers' perceptions of the persuasiveness of each text. Included in the

persuasiveness rating measure were statements related to whether: (a) readers cared about

what the author said, (b) the author included information that seemed real, (c) the author

helped the reader think about air pollution differently, (d) the examples in the text seemed

real, (e) the reader agreed with what the author was saying, and (f) the author included information that connects with what the read already knew.

A composite persuasiveness score for each text structure (argument and explanation) was obtained for each reader by finding the mean persuasiveness score for all eight items. If a reader skipped an item, the composite score was based on the remaining items. The composite persuasiveness scores for each reader (one for argument and one from explanation) were rounded to the nearest whole number. Using Cronbach's alpha procedure, which represents a model of internal consistency based on the average inter-item correlation, reliability scores for the text persuasiveness items were calculated. The reliability score for the argument text items was .816 and the reliability score for the explanation text items was .823 (See Table 3, Reliability Scores). Overall, these scores fall above the average acceptability range for reliability scores (Pedhazur, 1997) and are deemed acceptable for inclusion in the study.

Retrospective Verbal Reports

In addition to the quantitative data obtained from the written measures, qualitative data were obtained through retrospective verbal reports (Afflerbach, 2000), a task that was designed to capture fifth-grade readers' reasoning about persuasive text. In contrast to a think aloud which focuses on students' on-line reading comprehension while they read, the retrospective verbal report was designed to explore readers' reasoning after they read. The retrospective verbal report data supplemented the quantitative data gathered about fifth graders' reading of persuasive text.

The retrospective verbal report protocol was text-based (See Table 4, Retrospective Verbal Protocol for Argument and Explanation Texts). One protocol was

designed for the argument text and another was designed for the explanation text. The explanation structure aims to fill gaps in the reader's understanding through the use of sub-explanations and examples that are designed to relate to what the reader already knows. The argument structure aims to clearly state a claim and support that claim with warrants and data. Therefore, the retrospective verbal report was designed to explore how fifth grade readers evaluated the qualities of each structure.

Each retrospective verbal protocol began with a global, open-ended question concerning the reader's opinion of the text. The first question for the explanation text required readers to identify examples or information the author used in the text that helped them understand air pollution. The first question about the argument text began by asking readers to state the main idea of the text. This question was designed to see if readers stated the main idea of the text as a claim. Next, readers were asked whether the author did an adequate job supporting the claim and to cite specific evidence they found compelling. The open-ended nature of these questions explored readers' notions about the qualities of the texts they found important enough to mention.

Following the open-ended questions, each retrospective verbal report focused on specific elements of each text. The explanation verbal report drew reader's attention to three specific examples in the text and asked readers' opinions about each example. The argument verbal report asked readers' opinions about three pieces of evidence in the text. Finally, each retrospective verbal report concluded by asking readers whether the information in the text changed how they thought or felt about air pollution.

Table 4

Retrospective Verbal Protocol for Argument and Explanation Texts

Argument Text		Explanation Texts	
Focus of Question	Question	Focus of Question	Question
Comprehension focus and whether main point is stated as a claim	- What was the author's main point or opinion in this text? - Do you think that the author's point- or what is sometimes called a claim was clear in the text?		
Global question related to readers' opinions of the evidence	- Did the author support her claim well? Why? - What evidence did the author provide to support the claim? - Do you think that this evidence or information is convincing for a reader?	Global open-ended question about examples and readers' opinion	- Did any of the examples the author used in the text help you understand air pollution? Why? - Were there any parts of the text that seemed real to you or that you could easily relate to? Why?
Questions about specific evidence used in the text and readers' opinions about the evidence	- The author gave some evidence to support her claim on the first page under the sub-heading carbon dioxide and the atmosphere. How does this evidence support the author's claim? - The author gave more evidence to support her claim under the sub-heading acid rain. How does this evidence support the author's claim? - The final evidence that the author provided was under the sub-heading human's health. How does this evidence support the author's claim? - Of these three pieces of evidence to support the claim that air pollution is dangerous, (a) that air pollution releases dangerous chemicals into the air, (b) that air pollution causes acid rain to develop, (c) and that air pollution is harmful to human's health, which did you find most convincing or supportive of the author's claim as you read? Why?	Questions about specific sub-explanations utilized in the text and readers' opinions about them	- The author of this text included examples in the opening paragraph of how air pollution has affected various people. Is this a good example? - What did this make you think of as you read? - Under the sub-heading "Smoke and Sunlight" the author uses several examples to help the reader understand the physical effects of smog. - What were you thinking or feeling as you read that section? Have you ever experienced something like the author described? Did your experience help you picture in your mind what the author was describing - On the third page, the author describes cities that are surrounded by mountains like bowls where warm air and pollution get trapped. Was that example or illustration clear? How did it help/not help?
Effect of the text on the reader	Did the information in the text change how you thought or felt about air pollution? What changed? Why or why not?	Effect of the text on reader	Did the information in the text change how you thought or felt about air pollution? What changed? Why or why not?

Procedures

Data collection began during spring 2006 and continued approximately five weeks. Parental consent forms were sent home with students in March 2006. Students were given a week to return their signed forms. Those students who returned signed affirmative consent forms completed the task in a small group setting (two readers and one researcher) by the researcher. The task was administered in this way to provide a safe, comfortable environment for readers to complete the written tasks and clarify any questions that arose during the completion of the tasks.

The task began with readers completing the perceived knowledge, demonstrated knowledge, interest, and belief items (See Appendix F, Student Response Sheet). These items served as the pre-reading learner characteristics data. The presentation of the two texts was counterbalanced. After reading the first text, readers completed a persuasiveness rating measure for that text. Readers then read the second text and afterwards completed a persuasiveness rating measure for that text. After reading the two texts and completing two persuasiveness rating measures (one for each text) readers completed the perceived knowledge, demonstrated knowledge, interest, and belief continuous items. These items served as the post-reading learning characteristics data.

The task lasted approximately 30-45 minutes, with variability due to students' reading rates. Ten to twelve tasks were conducted each week. In addition to the small group tasks, four readers were selected to participate in retrospective verbal reports. Those readers who participated in the retrospective verbal report completed the task individually because they were audio-taped.

Individual student data was organized in an Excel spreadsheet file. Data included pre- and post-reading data, including learner characteristic data (perceived knowledge, demonstrated knowledge scores, composite interest, and composite belief scores) for each student and individual composite persuasiveness scores for each text. Item-level descriptive statistics were also tabulated for each student and measure (See Appendix H, Student Data).

Descriptive statistics were calculated for each of the continuous measures (i.e., mean, median, range and standard deviations) across readers. The mean, median, range and standard deviations for each learner characteristic (i.e., perceived knowledge, demonstrated knowledge, interest and belief) prior to and after reading and the persuasiveness ratings were calculated (See Appendix I, Item-level Summary Tables).

Each retrospective verbal report yielded an audio-taped record, which was transcribed within two days of its collection. The interviews were transcribed and the transcripts were categorized based on the text structure (argument or explanation) as well as the question the response answered. The qualitative data was used to supplement and further explain the analyses of the quantitative statistics in the following chapter. Using the research questions as a guide, the transcripts were reviewed once the data analyses were complete. Interesting or pertinent reader comments were included in the results to further explore the quantitative statistics.

Conclusion

The current study is based on the reciprocal relationship between the reader, the text, and the purpose. Learner characteristics (knowledge, interest, and beliefs) have been investigated and shown to be important influences on the persuasion of adult readers. The

interplay of elementary-aged readers' learner characteristics, text structure, and perceptions of the persuasiveness of persuasive text has been unexplored until now. This study explored the interaction of fifth graders' learner characteristics and perceptions of the persuasiveness of text. The next chapter presents a description of the quantitative analyses and results, supplemented with qualitative data, as appropriate. In addition, important findings and syntheses of the data are explained.

CHAPTER IV

RESULTS

This study was designed to explore the interplay of text and learner characteristics

on fifth graders' perceptions of the persuasiveness of text. The study addressed the

following research questions:

4. In what ways do fifth-grade readers differentially perceive the persuasiveness of

    argument and explanation structures?

5. What is the relation between fifth-grade readers' perceived knowledge,

    demonstrated knowledge, interests, and beliefs prior to and after reading

    persuasive text?

6. In what ways are perceptions about the persuasiveness of text associated with

    fifth-grade readers' perceived knowledge, demonstrated knowledge, interest, and

    beliefs?

This chapter summarizes the results of the data analyses. First, the descriptive

statistics are explained. Then, the results are presented in three sections, each of which

corresponds to the three research questions. Each section contains descriptions and results

of the statistical analysis, supplemented by qualitative data from the four readers'

retrospective verbal reports, as appropriate.

Descriptive Statistics

Various forms of quantitative data were obtained from each reader. Each reader

completed the Student Response Sheet, which yielded data about their learner

characteristics (i.e., perceived knowledge, demonstrated knowledge, interest, and beliefs)

before and after reading and their text persuasiveness ratings. The Student Response

Sheet included continuous data on each characteristic except demonstrated knowledge. The scores on the continuous items ranged from 0-150. A composite belief and interest score before and after reading was obtained from each reader based on their mean score for 6 items. Demonstrated knowledge was quantified using 15 multiple-choice items (See Appendix F, Student Response Sheet).

The descriptive statistics summarized below are presented in Table 5. These data show that each of the four learner characteristics increased after reading the two texts. Readers' perceived knowledge before reading (M = 68.04, SD = 34.69) increased substantially as a result of reading the texts (M = 120.44, SD = 22.88). On average, these fifth-grade readers thought they knew more about air pollution after reading.

Table 5

Mean and Standard Deviations for Learner Characteristics and Persuasiveness Ratings

Variable	Time	Min.	Max.	*M(SD)*
Perceived Knowledge	Pre-reading	7	142	68.04 (34.69)
	Post-reading	57	150	120.44 (22.88)
Demonstrated Knowledge	Pre-reading	3	14	7.44 (2.44)
	Post-reading	2	14	9.77 (2.65)
Interest	Pre-reading	26	128	81.85 (26.77)
	Post-reading	46	138	94.67 (24.31)
Beliefs	Pre-reading	54	150	122.02 (22.07)
	Post-reading	55	150	124.37 (21.52)
Argument Text		67	141	112.37 (19.42)
Explanation Text		64	150	111.37 (21.30)

Note: Only those items found reliable are included in descriptive statistics and data analyses.
n = 52 students for each cell

Readers' pre-reading demonstrated knowledge ($M = 7.44$, $SD = 2.44$), as indicated by the number of multiple-choice items they answered correctly out of 15, increased after reading ($M = 9.77$, $SD = 2.65$). The increase in demonstrated knowledge indicates that readers knew more about the topic of air pollution after reading the two texts.

Readers' interest before reading ($M = 81.85$, $SD = 26.77$) increased as a result of reading the two texts ($M = 94.67$, $SD = 24.31$). Readers were asked to agree or disagree (along a continuous scale) with the behaviors stated in each interest item (e.g. "*I try to save water by turning off the water while I brush my teeth or limiting how long my shower is.*"). A higher interest score indicated that readers agreed with the interest statements and would be inclined to modify their behavior as a means of lessening their impact on the environment.

Finally, readers' beliefs before reading ($M = 122.02$, $SD = 22.07$) increased slightly as a result of reading the two texts ($M = 124.37$, $SD = 21.52$). The belief items were opinion statements that asked readers to rate their agreement or disagreement with each statement. A higher belief score indicated that students agreed with the statements. The high pre-reading belief score indicated that many readers already agreed with the stance of the author prior to reading.

In addition to the learner characteristics, the Student Response Sheet also included a Text Persuasiveness Rating measure for each text. This measure was designed to quantify readers' perceptions of the persuasiveness of each text. After reading each text

(argument or explanation), students responded to 8 continuous-scale items. Each item had a score that ranged from 0-150 and the mean of these items yielded a composite persuasiveness rating for each text. These data revealed that the readers found both texts to be persuasive, though the argument text received a marginally higher rating on persuasiveness (M = 112.37, SD = 19.42) than the explanation text (M = 111.38, SD = 21.30).

In sum, each of the four learner characteristics increased as a result of reading the texts. Overall, readers' perceived knowledge increased the most after reading (approximately 40 units). This indicates that readers felt that they gained knowledge after reading the texts. Readers' belief scores increased slightly as a result of reading (approximately 4 units). Readers' mean belief scores were fairly high (M = 122.02) before they read, indicating they agreed with the stance of the author. Both texts were found to be equally persuasive.

The next three sections address the results of several statistical analyses in relation to each of the three research questions.

<div align="center">Data Analyses and Results</div>

As reported in Chapter III, reliability scores for the various measures used in this study were calculated using the Cronbach alpha procedure and the Kuder-Richardson 20 formula (Pedhazur, 1997). The descriptive statistics and data used in all of the analyses included only those items deemed reliable. Decisions involving inclusion or omission of items were considered based on reliability scores. The initial pre- and post-reading belief scores had low reliability scores. A significant difference between the pre-reading [t (1, 51) = -5.545; p = .000] and post-reading [t (1, 51) = -4.664; p = .000] reverse and non-

reverse worded items was confirmed through a paired samples t test conducted on the belief items. The significant results of the t test indicated that readers answered the two types of questions differently. Therefore, based on the significant t test results and higher reliability scores without the items, the reverse-worded belief items were excluded from all further data analyses. All other items were retained.

Following the calculation of reliability scores, other statistical analyses were conducted to assure that particular data analyses were warranted. During data collection, the two types of texts were presented in different order to readers. Half of the readers read the argument text first and the explanation second and the other half read the texts in the opposite order. Therefore, to explore whether the order of presentation of texts interacted with readers' persuasiveness ratings, a multivariate analysis of variance (MANOVA) was conducted. The independent variable was the order of presentation and the dependent variables were the persuasiveness ratings. There are multiple dependent variables (persuasiveness ratings) being influenced by the same independent variable (order). The use of a MANOVA allowed both to be tested at the same time and to decrease family-wise error (Lomax, 2000). With an alpha level of .05, the effect of order was not significant, $F (2, 49) = 1.30$, $p = .282$. Additionally, the r-squared values when argument was presented first ($r^2 = .02$) and when explanation was presented first ($r^2 = .05$) were quite low. These low values indicate that less than 5% of the variance of the scores is due to order. Consequently, the order of text presentation was not a factor to be considered in subsequent data analyses.

Following the determination that the reliability scores of the measures were adequate and order was not a significant influence on readers' rating of the

persuasiveness of text, the data were analyzed. All data analyses and descriptive statistics include only those items considered reliable. The methods used to analyze each research question are summarized below. A summary of how the data meet the assumptions for each test is included in each section.

The Influence of Text Structure on Fifth Graders' Persuasiveness Rating

After reading each text, the readers were asked to respond to 8 continuous-scale items that prompted them to either strongly disagree (score = 0) or strongly agree (score = 150) with a statement that was related to the text they read. The mean of those 8 items served as a composite rating of how persuasive these readers found the argument and explanation texts. The average composite ratings ($M = 112.37$, $SD = 19.42$ for the argument text; $M = 111.38$, $SD = 21.30$ for the explanation text) revealed that the readers rated the argument and explanation texts as persuasive.

To test whether there was a difference between these means, a dependent paired-sample t test was conducted. A t test was conducted based on the simple assumptions associated with t tests and the fact that two groups are being compared. Prior to conducting the t test, the data were analyzed to assure they met the assumptions related to the dependent t test (Lomax, 2000). All observations of the paired variables were conducted under the same conditions. The variables were found to be normally distributed based on skewness and kurtosis levels which fell between -1.96 and + 1.96. The paired variables were students' composite persuasiveness rating scores of the argument and explanation text. Since there were two variables and each reader read and rated each text, the dependent t test allowed for exploration of differences within each reader (Lomax, 2000).

The effect of text structure was found not to be a significant factor in the readers'
rating of the perceived persuasiveness of the texts, $t(1, 51) = .356, p = 0.723$. In these
fifth graders' view, the text written explicitly to support a claim (argument) was just as
persuasive as the text written to add to readers' understanding of the topic (explanation).

In order to explore the influence of both texts on readers' demonstrated
knowledge, a frequency chart was created (See Appendix J, Frequency Chart of
Demonstrated Knowledge Measure). The chart includes the frequency with which readers
responded to each of the demonstrated knowledge items before and after reading both
texts. In addition, the chart specifies which text answered the corresponding question. Of
the 15 multiple-choice questions, 2 were answered exclusively in the argument text, 5
exclusively in the explanation text, and the remaining 8 in both texts.

The means of the demonstrated knowledge items which corresponded to the
argument text did not change pre- and post-reading (See Table 6, Demonstrated
Knowledge Items in the Argument Text). The argument text was not overly successful in
altering readers' knowledge. However, argument text is designed to support a claim, not
to address readers' knowledge.

Table 6

Demonstrated Knowledge Items in the Argument Text

Question and correct answer	Number correct before reading	Number correct after reading
The rise of temperatures on Earth is known as: c. global warming	23	22
The ozone that exists 10-30 miles above the Earth's surface is b. protecting us from the sun's harmful ultraviolet rays	35	34

Overall, the explanation text was effective in altering readers' understanding of air pollution. Five questions on the demonstrated knowledge measure were answered by information contained exclusively in the explanation text. The number of readers who chose correct responses to most of those five items increased after reading (See Table 7, Demonstrated Knowledge Items in the Explanation Text).

Table 7

Demonstrated Knowledge Items in the Explanation Text

Question and correct answer	Number correct before reading	Number correct after reading
Ozone is formed when: c. sunlight hits pollutants in the air	21	44
Which place would most likely have the highest level of air pollution? b. a crowded, busy city surrounded by mountains	8	20
When airborne chemicals are put into the air and they react with sunlight what substance is formed? d. smog	18	45
The US government is taking steps to reduce air pollution by: d. setting limits on the amount of chemicals that factories can release into the air.	22	21
Air pollution is worse during the: b. summer	9	21

One question (#10) was particularly difficult for many readers. This question stated: "*The US government is taking steps to reduce air pollution by*:" and the correct answer was: "d. *setting limits on the amount of chemicals that factories can release into the air*." However, before reading, 22 readers chose this as the correct answer and after

reading, only 21 chose it. Another answer which read: *"b. asking people to recycle"* was frequently chosen as the correct answer by 23 readers before reading and 17 after reading. While government programs aim to increase recycling, recycling does not directly impact air pollution which was the focus of the question. This question was the only explanation question that did not alter readers' understanding.

The argument text, which aimed to support a claim, was less effective at addressing readers' understanding of air pollution. This finding was expected. However, according to the *t* test results, both texts were effective at persuading despite the fact that they both are not organized for that purpose. The persuasiveness of the explanation text is surprising, yet the fact that it addresses readers' knowledge could ultimately prove persuasive. In addition, explanation structure may perform two purposes at the same time; altering knowledge and persuading readers.

The retrospective verbal protocol was explored as a means of further understanding the text features that readers found convincing. Readers who participated in the retrospective verbal report stated that both the argument and explanation texts changed how they thought about air pollution though to varying degrees (See Appendix K, Retrospective Verbal Report Transcripts). As seen in Table 8, the four readers selected for the retrospective verbal report had a range of learner characteristic levels, which provides insight into a variety of readers' insights concerning the texts.

The selection of readers' comments for inclusion was based on several factors. The decisions regarding which readers' comments to include were based on the content of each reader's comments as well as the alignment of their learner characteristics levels or comments with the idea presented. An attempt was made to include a variety of

viewpoints as well as particularly interesting qualitative data which further described the

quantitative data.

Table 8

Retrospective Verbal Report Participants' Descriptive Statistics

Learner Characteristic	*M (SD)*	Charlie	Hada	Sean	Lily
Perceived knowledge					
Pre-reading	68.04 (34.69)	35	120	125	55
Post-reading	120.44 (22.88)	139	142	149	129
Demonstrated knowledge					
Pre-reading	7.44 (2.44)	3	9	9	10
Post-reading	9.77 (2.65)	10	14	12	12
Interest					
Pre-reading	81.85 (26.77)	44	121	90	85
Post-reading	94.67 (24.31)	73	128	117	98
Beliefs					
Pre-reading	122.02 (22.07)	134	139	140	110
Post-reading	124.37 (21.52)	135	140	139	104
Text Persuasiveness					
Argument	112.37 (19.42)	130	124	141	103
Explanation	111.38 (21.30)	122	133	127	103

Readers' rating of the persuasiveness of the two texts seemed to be influenced by

their prior knowledge and stance on the topic of air pollution. One reader, Charlie, stated

that he felt both texts changed how he felt about air pollution and, as a result, he rated the

texts as persuasive. After reading the argument, Charlie reported that both texts changed

how he thought about air pollution:

> Interviewer: So, did the information in this text [argument] change how you
> thought or felt about air pollution?
>
> Charlie: Oh yeah! Because I thought about air pollution…I was thinking,
> Yeah, I studied some of air pollution in our science thing. But then

> when I read all of this it really gave me a new look on how air pollution is and how people pollute the air and how it can be really damaging to us.

At another point in the interview, Charlie continued talking about the explanation text:

Interviewer: Ok, so do you think that the information in the text [explanation] changed how you thought or felt about air pollution?

Charlie: Yes…well yes it did a lot. Before I would be thinking that air pollution, 'Yeah, it is all the way up in the sky and it doesn't damage us and we have our lives to live and all that.' But now that I have read this [pointing to text] air pollution has really taught me that we just don't have our lives to just, that we have to always be careful of what we're putting into the atmosphere.

Charlie indicated that he was equally influenced by both texts. Both the argument and explanation structures changed how he felt about air pollution. Prior to reading the text, Charlie implied that he did not feel that air pollution was a tangible concern; however, after reading the text, he reported that he was convinced of the dangers of air pollution. Charlie's statement that before reading the text he did not think air pollution was a threat to us does not align with his pre-reading belief score which is 134. Charlie's agreement with the author about the dangers of air pollution before reading, in his mind, did not mean that he thought the dangers of air pollution were all that real. After reading both texts Charlie rated both the argument ($M = 130$) and explanation ($M = 122$) texts above the mean.

Another reader, Lily, generally agreed with the stance of the author, but did not rate the texts as persuasive. Lily reported that both texts did not change the way she viewed the topic of air pollution because she felt that she already knew that air pollution was dangerous:

Interviewer: So did this information in the text [explanation] change how you thought about air pollution at all?

Lily: Um a little bit. I mean I always knew that it was like real bad. But I didn't know that stuff like this could happen and like that it is such a big concern.

After reading the argument text, Lily reported that she knew much of the information contained in the text:

Interviewer: So did this text [argument] change how you thought about air pollution at all?

Lily: A little. I mean I know most of it, like air pollution can cause asthma and acid rain and stuff, but it changed a little.

Interviewer: Okay, so a lot of the information you read in the text you felt like you already knew?

Lily: Yeah.

Prior to reading, Lily had moderate beliefs about the dangers of air pollution as indicated by her composite pre-reading belief score of 110. After reading, Lily's belief score was 104, almost one standard deviation below the mean. She felt that both texts contained information which she knew and with which she agreed, in fact she gave both texts an identical persuasiveness rating of 103.

While readers found each text persuasive, they had particular aspects of each text they found more convincing. Across the four readers who were interviewed, each found particular evidence in the argument text more convincing than other evidence. The purpose of an argument structure is to argue in support of a particular claim. Readers were asked to evaluate the effectiveness of the three pieces of evidence the author presented. During the retrospective verbal reports, three out of four readers found the

evidence about the effect of air pollution on humans' health to be the most convincing

evidence the author presented. One of those three readers, Hada, stated:

Interviewer: So of these three, the carbon dioxide, the acid rain…and the human
                health, which of these three did you find to be the most convincing
                or supportive of the claim that air pollution is a real threat to us?

Hada: Um, I think the human health.

Interviewer: Why?

Hada: Because it has more to do with us and everything else. I mean
                people might get it more if they see that it might happen to them
                and they might not really care if it happens to the elderly and in
                other places or animals. It convinces them more if it happens to
                them.

Hada indicated that in her opinion, in order for information in the text to

effectively convince readers, the reader needs to be made explicitly aware of the direct

effect on him or her. These data suggest that information that directly related to the reader

was deemed the most convincing by this reader.

Readers indicated that the information in the explanation text that related to their

past experiences or knowledge was the most convincing. Recall that the purpose of the

explanation structure is to fill gaps in readers' understanding about a particular topic. The

explanation structure accomplishes this through the use of various sub-explanations

aimed at tapping readers' prior understanding and building upon that as a means of

furthering their understanding. Readers were asked to identify any examples that helped

them understand the text. In response, Hada stated:

Interviewer: In the section entitled, "What is Smog?" are there any examples
                that the author used that you thought were particularly helpful in
                helping you understand the text?

Hada: Yes I did. One example was how kids in LA could not play outside
                all the time because the smog was so thick. That kind of helped me

understand that it is that dangerous and it can really damage your lungs or your eyes.

Interviewer: Good. Any others you can think of?

Hada: Um, well also riding in the car and it was kind of hot and all the cars were letting out exhaust. You just open the window and you can't breathe. They you can't do anything about it because your eyes are burning and then you have to turn on your air conditioning which also increases air pollution.

Interviewer: So that example you just talked about, how did that help you as a reader?

Hada: Well it helped me understand that we should try to walk for short distances and not use a car everywhere we go because that will really increase it.

Interviewer: Were there any examples in here [pointing to the text] that helped you physically feel what was going on? Or pictures where you thought, oh I have had that happen to me before?

Hada: Yeah actually once we went to LA and every single time we tried to go somewhere to travel our aunt made us wear sunscreen and a visor and we couldn't stay out too long or…and we mostly traveled around after dark.

Interviewer: Good, so you have first-hand experience with that. What I want to ask you, when you were talking about how it affected you as you drove around in a car and how you roll down your window…have you ever had that happen, where there has been so much pollution in the air and you didn't realize so you rolled down the window and your eyes were watering?

Hada: Um, actually we travel a lot when we go to New Jersey because we drive. There was this one time I think I was about seven, we tried, there was big traffic jam and it took about 8 hours to get there. We tried opening the windows because it was midday and really hot. But my littlest sister started coughing really bad and my sister with the glasses, her eyes just started getting red. So my mom had to close the windows and turn on the air conditioning.

Here, Hada illustrated the relation between examples used in the text and her previous experiences. She reported being able to connect to the text as a result of having

had similar experiences. When asked what helped her understand the explanation text

Hada replied:

> Hada: I think this text helped me cooperate with my first-hand experience. With the other text [argument], no one in my family has asthma or lung disease and things like that so…
>
> Interviewer: It didn't really connect?
>
> Hada: Yeah, it didn't really comment with this one [pointing to the argument text] it connected more to this one [pointing to explanation text].

In addition to the information included the text, readers noted that the

organization of the explanation text was effective in helping them understand the text.

Lily stated that several features of the explanation text helped her:

> Lily: Um like they told us…like what they would do was like, "What is Smog?" and then told what causes it and that kind of helped you understand so it made more sense.
>
> Interviewer: So the use of a question…
>
> Lily: Yeah.
>
> Interviewer: Good. Were there any other parts of the text that seemed real to you or that you could kind of fully understand?
>
> Lily: Um well all of the same kind of real possible, like it could really happen kind of stuff.
>
> Interviewer: So it was realistic, but were there any parts as you were reading where you actually felt like you were there or…
>
> Lily: Well I kind of can understand like this could really happen.

Lily felt that the use of subheadings helped her and the sub-explanations and

examples used in the text seemed real to her. Lily reported that the framing of the

subheading as a question helped her understand the information, because she was able to

better grasp what that particular section covered. In addition, Lily reported that the

examples and sub-explanations were accessible and seemed real, which helped her understand the information in the text.

In summary, these data suggest that text structure was not an influential factor in fifth graders' perceptions of the persuasiveness of text. Both the argument and the explanation text were deemed to be persuasive by fifth-grade readers. Explanation text, written to explain a topic to readers through sub-explanations that connect to their background knowledge, was just as convincing as argument text, written to support a claim. Based on the analysis of the demonstrated knowledge measure, the explanation text was effective at addressing readers' knowledge about air pollution. Readers' understanding about air pollution was altered by information contained in the explanation text. Explanation text was also effective at convincing readers of the dangers of air pollution. The dual nature of the explanation text makes it a potentially powerful text structure.

The participants in the Retrospective Verbal Report illuminated several important aspects of each text that they found compelling. Readers stated that the information in both texts related to them on a personal level. This personal connection to the text was important in helping them understand the dangers of air pollution. In the argument text, the evidence cited as most convincing was that which explained the direct effect of air pollution on humans' health. In the explanation text, the sub-explanations that illustrated the direct influence of air pollution on people (the need to stay indoors and eye-burning associated with too much smog) was mentioned as the most important to readers. The connection readers' made with the information in both texts helped convince these fifth-grade readers to agree with the author's stance in both texts.

Relations Among Learner Characteristics

The second research question addressed the relation between readers' learner characteristics before and after they read persuasive text. Correlation analyses were used to explore these relations. The data were found to meet all of the assumptions for correlation analyses (Pedhazur, 1997). Based on scatter plots of the z scores, all of the pre- and post-reading learner characteristics were found to have a linear relationship. In addition, the variables were found to be normally distributed based on skewness and kurtosis levels which fell between -1.96 and + 1.96. After ensuring the data met the assumptions, correlation analyses revealed that four learner characteristics were positively correlated prior to and after reading both texts (See Table 9).

Pre- and Post-Reading Correlations

The learner characteristic with the strongest pre- and post- reading correlation was interest ($r = .778, p < .01$). The pre- and post-reading correlations for beliefs ($r = .681, p < .01$), demonstrated knowledge ($r = .448, p < .01$) and perceived knowledge ($r = .502, p < .01$) were also significantly and positively correlated. The positive, significant correlations between the pre- and post-reading learner characteristics were expected and are an indication that the instruments measured the relations they were designed to capture.

In addition to the correlations within each pre- and post-reading learner characteristic, relations between learner characteristics emerged as well. Those relations of interest will be further explored as a means of gaining understanding concerning elementary readers' characteristics as well as the influence of text on these readers.

Table 9

Intercorrelations Between Learner Characteristics and Text Persuasiveness

	1	2	3	4	5	6	7	8	9	10	11
1. Pre-reading perceived knowledge	-	.502**	.283*	.231	.306*	.365**	.117	.222	.132	.122	.152
2. Post-reading perceived knowledge		-	.211	.344*	.141	.239	.379**	.390**	.307*	.371**	.391**
3. Pre-reading demonstrated knowledge			-	.448**	.050	-.023	.285*	.243	-.192	-.035	-.119
4. Post-reading demonstrated knowledge				-	.112	.259	.393**	.360**	.131	.453**	.336*
5. Pre-reading interest					-	.778**	-.014	-.020	.185	.198	.206
6. Post-reading interest						-	.239	.282*	.395**	.466**	.473**
7. Pre-reading beliefs							-	.681**	.390**	.414**	.435**
8. Post-reading beliefs								-	.615**	.580**	.651**
9. Argument Structure									-	.694**	.927**
10. Explanation Structure										-	.910**
11. Text Persuasiveness Rating											-

n = 52 readers
* Correlation is significant at the 0.05 level (2-tailed)
** Correlation is significant at the 0.01 level (2-tailed

Demonstrated Knowledge Increased

The relation between readers' pre- and post-reading demonstrated knowledge (r =.449, $p < .01$) shows that those readers who knew a lot about the topic before reading knew a lot about the topic after reading, as well. However, the demonstrated knowledge scores increased as a result of reading based on the increase of the mean before reading ($M = 7.44$) and after reading ($M = 9.77$). Readers' demonstrated knowledge increased an average of 2.5 units or 16% (see Figure 1), which means that, on average, readers answered 2.5 more multiple-choice items correctly after reading.

Three readers' demonstrated knowledge decreased (-1 or -2) and the demonstrated knowledge of 7 readers remained unchanged as a result of reading the texts. Thirteen readers

Figure 1

Difference in Readers' Pre- and Post-Reading Demonstrated Knowledge Scores
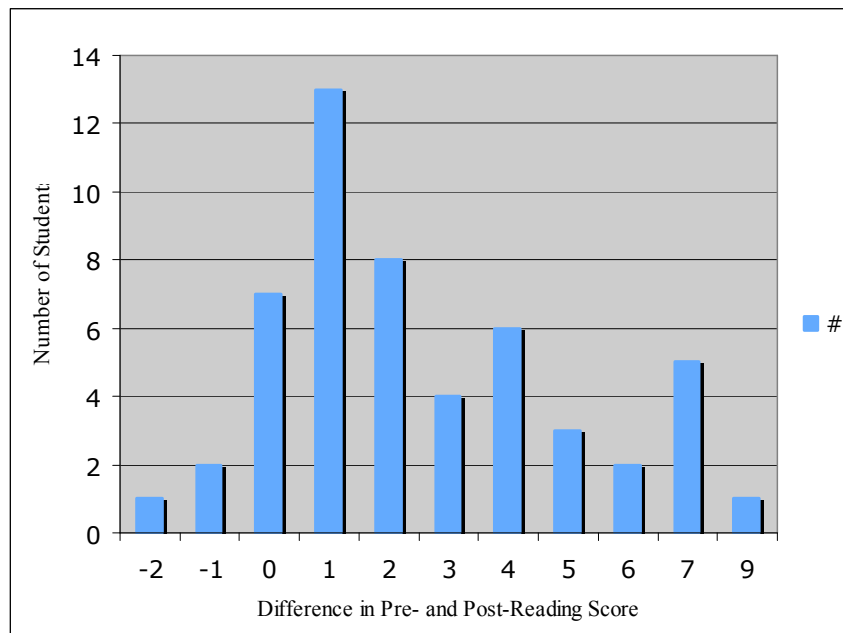
answered one more question correctly after reading. Eight readers' answered two more questions correctly after reading. Four readers answered three more questions correctly. Six readers answered four more questions correctly after reading. Eleven students answered 5 or more questions correctly after reading, with one student answering 9 more questions correctly after reading. Overall, readers' demonstrated knowledge increased as a result of reading the two texts. Readers' pre-reading demonstrated knowledge level tended to be the same as their post-reading level.

Readers Were Aware of the Knowledge They Possessed

Readers displayed an awareness of the knowledge they possessed about the topic of air pollution. Pre-reading perceived knowledge was significantly correlated with pre-reading demonstrated knowledge ($r = .283, p > .05$). Readers' post-reading perceived knowledge was significantly correlated with post-reading demonstrated knowledge as well ($r = .344, p > .05$).

For instance, Charlie had a pre-reading perceived knowledge level of 35, almost one standard deviation below the mean. His demonstrated knowledge level before reading was 3, which is almost two standard deviations below the mean. Charlie did not think he knew a lot about the topic of air pollution and his demonstrated knowledge level indicated his perceptions of his knowledge were accurate. In contrast, Sean had a pre-reading perceived knowledge level of 125, more than one standard deviation above the mean. Sean's demonstrated knowledge level before reading was 9, almost one standard deviation above the mean. Readers with both high and low perceived knowledge levels were accurate in their assessment of the knowledge they possessed about air pollution.

The self-awareness that readers displayed about their level of knowledge before reading shows that these readers had a fairly accurate perception of how much they actually knew. Readers' perceived knowledge increased by nearly 33%, on average, while their demonstrated knowledge increased by an average of 16%. The same positive, significant correlation between perceived and demonstrated knowledge after reading did not exist.

Examination of the transcripts from the retrospective verbal report found several instances where readers' articulated awareness of the knowledge they possessed. After reading, Charlie's demonstrated knowledge went from 3 to 10, indicating he learned a lot from the text. When asked which evidence he found convincing, Charlie replied:

> Charlie: Well I would say acid rain is a surprising thing. Yeah, I would say as I read--acid rain. I didn't know acid rain could happen on places on earth and it really surprised me and I found it really persuaded me that acid rain could also damage like streams and damage animals and people or the citizens that live near the place and stuff like that.

Charlie demonstrates that he learned a lot of information about acid rain and, in turn, this new information helped persuade him of the dangers of air pollution. Charlie explicitly states that he learned new information from reading the texts and the increases in his perceived knowledge and demonstrated knowledge scores support his claim of learning information. Charlie was accurate in his assessment that he learned a lot of new information as a result of reading the texts.

In contrast, Lily clearly stated that she did not learn new information after reading the texts. Her demonstrated knowledge score went from a 10 before reading to a 12 after reading. While both are above the mean, she was accurate in stating that she did learn a

lot of new information in the texts. When asked whether what she read in the text changed how she felt about air pollution, Lily responded;

> Lily: A little, I mean I know most of it, like air pollution can cause asthma and acid rain and stuff, but it changed a little.

This pattern was repeated throughout the discussion with Lily, as she seemed unaffected by the texts, because she claimed to already know much of the information. Her consistently high demonstrated knowledge scores show that Lily was accurate and that she did already know a lot of the information in the texts, so she had an accurate awareness of her knowledge level.

In sum, the fifth-grade readers' ability to accurately assess their knowledge before reading shows that most readers were accurate in their self-assessment. The same did not hold true after reading, where readers' perceived and demonstrated knowledge were not related.

Knowledge and Beliefs Were Related

Several interesting relations among knowledge and belief levels existed across readers. First, demonstrated knowledge and beliefs were related. Pre-reading demonstrated knowledge and pre-reading beliefs were positively and significantly correlated ($r = .285$, $p < .05$). Those readers who knew more about the topic of air pollution before reading tended to agree with the stance of the author. In contrast, those readers who did not know a lot about air pollution before reading tended to disagree with the stance of the author. Post-reading demonstrated knowledge was positively and significantly correlated with pre-reading beliefs ($r = .393$, $p < .01$) and post-reading beliefs ($r = .360$, $p < .01$). This indicates that readers with high levels of demonstrated knowledge after reading tended to agree with the stance of the author both before and

after reading. Readers who agreed with the stance of the author before reading may have been more open to gain knowledge from the text because of their agreement with the stance of the author than their peers who did not agree with the stance of the author. Disagreement with the stance of the author before reading could have prevented readers from learning from the text, because they did not agree with the stance of the author.

The knowledge that readers brought to the task of reading was positively correlated with their beliefs about the topic before reading. Hada illustrates this point. Before reading, Hada's belief level was 139 and after reading it was 140. Clearly before and after reading the texts, Hada agreed with the stance of the author. After reading, Hada's demonstrated knowledge score increased to a 12, which is above the mean. Hada illustrated that the text changed how she thought about air pollution:

Interviewer: Did this text [argument] change how you thought about air pollution at all?

Hada: Um, yeah, it did. I learned more that I usually did. I didn't think it [air pollution] was really that big of a deal though.

Interviewer: Okay, so before you read you didn't think it was a big deal…

Hada: Well I knew it was important, but not this important, like it could damage our health.

While Hada states that the texts really changed how she thought about air pollution, she states that she learned a lot about air pollution from the texts. Before reading, she thought air pollution was dangerous, but learned new information from the texts to further support her agreement with the stance of the author. The more a reader knew about air pollution, the more likely that reader was to believe in the dangers of air pollution.

Second, readers' perceived knowledge and beliefs were significantly related. After reading both texts, readers' perceived knowledge was positively and significantly correlated with pre-reading ($r = .379$, $p < .01$) and post-reading ($r = .390$, $p < .01$) beliefs. Readers' perceptions of the knowledge they possessed after reading both texts was related to their agreement with the stance of the author. Readers who agreed with the stance of the author tended to feel they knew an adequate amount about the text after reading. Those readers who agreed with the stance of the author before and after reading felt they had high levels of knowledge about air pollution.

Knowledge and Interest were Related

Readers' perceived knowledge before reading was positively and significantly correlated with their pre-reading ($r = .306$, $p < .05$) and post-reading ($r = .365$, $p < .01$) interest. Readers who felt they knew a lot about air pollution were interested in the topic. Whereas, readers who did not feel they knew much about the topic were not interested in the topic.

This relation illustrates the power of perception. While demonstrated knowledge was not significantly related to interest, readers' perception of how much or what they knew was related to their interest. It is interesting to note the relation discussed earlier between demonstrated knowledge and beliefs. The amount of knowledge readers possessed about air pollution was related to their agreement with the stance of the author, whereas the amount of knowledge readers *thought* they knew was related to interest. Additionally, before reading readers' perceived knowledge was related to interest, yet after reading their perceived knowledge was not significantly related to interest. Instead, readers' perceived knowledge after reading was significantly related to their belief level.

The relation between pre-reading demonstrated knowledge and post-reading interest was close to zero ($r = -.023$). If a reader had a low level of demonstrated knowledge before reading, her level of interest after reading could be high. In some cases, the texts spurred readers' interest after reading. On the other hand, demonstrated knowledge could have limited readers' levels of interest. If a reader had high demonstrated knowledge before reading, she could have little interest in the topic after reading.

Lily is a good example of this dichotomy. Lily possessed a high level of knowledge about the topic of air pollution before reading. Her pre-reading demonstrated score was 10 correct out of 15, which is almost one standard deviation above the mean of 7.44. Her post-reading interest score was 98, quite close to the mean of 94.67. While Lily's knowledge of air pollution was high as indicated by her demonstrated knowledge score, she was only moderately interested in the topic after reading.

The relation of perceived knowledge before reading and interest speaks to the strong influence of perception. Readers were able to become interested in the topic since they felt they knew a lot about it. However, demonstrated knowledge, or the amount of knowledge they actually possessed, did not influence their interest in the topic. There was not a significant relation between interest and demonstrated knowledge.

Interest and Beliefs Were Related After Reading

A significant, positive relation existed between post-reading interest and post-reading beliefs ($r = .282$, $p < 0.05$). Readers who indicated that they agreed with the stance of the author after reading were more likely to express an interest in the topic. In contrast, readers who did not agree with the stance of the author were less likely to be

interested after reading. The more a reader was interested in a topic after reading the more likely they were to agree with the stance of the author.

Overall, readers' learner characteristics before and after reading were positively and significantly correlated. In addition, several significant correlations between characteristics existed. First, readers displayed a keen awareness of their knowledge. Readers' perceived knowledge level was related to their demonstrated knowledge level. Second, readers' demonstrated knowledge about the topic was related to their beliefs about the topic or their agreement with the stance of the author. Third, readers' perceived knowledge before and after reading was related to their interest before and after reading. Finally, readers' beliefs and interest after reading were related. The more a reader was interested in a topic, the more likely they were to agree with the stance of the author.

The Interplay of Learner Characteristics and Perceived Persuasiveness of Text

Two sets of multiple regressions were conducted to explore the third question. The first pair of regressions looked at the proportion of the variance of readers' rating of the persuasiveness of the texts explained by readers' learner characteristics. The second set of four regressions explored the proportion of the variance of readers' learner characteristics explained by their rating of the persuasiveness of the texts.

Multiple regression is used to predict the variance in a dependent variable based on linear combinations of independent variables (Hill & Lewicki, 2006; Pedhazur, 1997). As an application of the general linear model, multiple regression is used in one set of regressions to explore the presence of any significant predictors of readers' persuasiveness ratings of the texts. In the other set of regressions, multiple regression is

used to explore the presents of any significant predictor of change in learner characteristics as a result of reading the texts.

Prior to analysis, the data were tested to ensure they conformed to the assumptions associated with multiple regression (Pedhazur, 1997). A scatterplot of the *z* scores showed a linear relationship between the variables. To assure normality of errors, the unstandardized residuals for each regression were calculated. These unstandardized residuals were found to fall within the acceptable normal range of -1.96 and +1.96; therefore, normality was accepted. A scatterplot of the scores and the residual values showed homogeneity of the variances. The homoscedasticity of the residuals shows that there was no pattern for the residuals and there is random dispersal of the errors, as specified in the assumptions for multiple regression. All of the assumptions for the data were met and the regressions were conducted.

It is important to note that the analyses related to the first two research questions impacted the method used to answer the third research question. Recall that a *t* test revealed no significant difference in readers' rating of the persuasiveness of the argument and explanation texts, t (1, 51) = .356, p = .723. Correlation analyses also showed a significant relation between the persuasive ratings of the argument and explanation texts (r = .694, p < .01). Therefore, these two findings led to the decision to combine the rating scores of the two texts to find a mean persuasiveness rating for text.

Association of Learner Characteristics on Persuasiveness Ratings

Two forward selection multiple regressions were conducted. The forward selection procedure enters the variable which predicts the most variance first and then continues to add variables that continue to explain a significant amount of variance above

the predictors already in the model (Lomax, 2000). The use of a forward selection

multiple regression was based on the exploratory nature of the study and the absence of a

theory to guide the inclusion of particular learner characteristics over others. Each of the

learner characteristics were deemed potentially important. The results of the regressions

(Tables 10 and 11) allowed for exploration of how learner characteristics' predicted the

readers' rating of text persuasiveness.

In one forward selection multiple regression, the independent variables were the

four pre-reading learner characteristics (perceived knowledge, demonstrated knowledge,

interest and beliefs) and the dependent variable was the persuasive text ratings. The

model including readers' beliefs, demonstrated knowledge, and interest explained the

most variance in readers' ratings of the persuasiveness of the text. Individually, beliefs (p

= .000), demonstrated knowledge (p = .026) and interest (p = .048) each make a

significant contribution to the variance in the persuasiveness ratings. The adjusted *r-*

squared value for the model including demonstrated knowledge, interests, and beliefs is

.307. These three variables explain 31% of the variance in readers' rating of the

persuasiveness of the texts. Before reading, readers' beliefs, demonstrated knowledge,

and interests significantly predict variance in elementary readers' rating of the

persuasiveness of text.

Table 10

Forward Regression Analysis for Pre-Reading Learner Characteristics' Prediction of

Persuasiveness of Text

Variable	Unstandardized Coefficients		Standardized Coefficients
	B	*SE B*	*ß*
Model 1			
Pre-reading beliefs	.415	.109	.475**
Model 2			
Pre-reading beliefs	.482	.110	.552**
Pre-reading demonstrated knowledge	-2.074	.972	-.268*
Model 3			
Pre-reading beliefs	.486	.106	.556**
Pre-reading demonstrated knowledge	-2.174	.943	-.281*
Pre-reading interest	.167	.082	.237*

Note: $r = .475$, $r^2 = .226$ for Mode 1; $r = .540$, $r^2 = .292$ for Mode 2; $r = .590$, $r^2 = .348$ for Mode 3.
** Significant at $p < .01$
* Significant at $p < .05$

In the second forward selection regression, the independent variables were the

four post-reading learner characteristics and the dependent variable was the persuasive

text ratings. The model including readers' beliefs and interest explains the most variance

in readers' ratings of the persuasiveness of the text. Individually, beliefs ($p = .000$) and

interest ($p = .008$) each make a significant contribution to the variance in the

persuasiveness ratings. The adjusted *r-squared* value for the model including interest and

beliefs after reading was

Table 11

Forward Regression Analysis for Post-Reading Learner Characteristics' Prediction of

Persuasiveness of Text

	Unstandardized Coefficients		Standardized Coefficients
Variable	*B*	*SE B*	*ß*
Model 1			
Post-reading beliefs	.571	.094	.654**
Model 2			
Post-reading beliefs	.493	.092	.563**
Post-reading interest	.227	.082	.293**

Note: *r* = .654, *r²* = .427 for Mode 1; *r* = .710, *r²* = .505 for Mode 2.
** Significant at *p* < .01

.485. Therefore, nearly 49% of the variance in readers' rating of the persuasiveness of the

texts is predicted by these two variables. After reading, the variance in readers' beliefs

and interest predicts the variance in the text persuasiveness rating.

In summary, these multiple regression analyses revealed that readers' beliefs,

demonstrated knowledge and interest before reading predict the readers' ratings of the

persuasiveness of text after reading. After reading, their beliefs and interests predict their

ratings of the persuasiveness of text. The exclusion of demonstrated knowledge from the

post-reading regression is surprising, yet examination of the output from the pre-reading

regression shows that demonstrated knowledge, while a significant predictor, seems to

have a negative relationship with the dependent variable, or readers' rating of the persuasiveness of the texts.

Association of Persuasiveness Rating on Learner Characteristics

In addition to the first set of multiple regression analyses that explored the association of readers' learner characteristics on their rating of the persuasiveness of the texts, another set of multiple regression analyses was conducted. These multiple regressions were designed to explore the ability of readers' persuasive rating to predict a change in their learner characteristics as a result of reading.

For each regression, the post-reading learner characteristic was the dependent variable and the pre-reading learner characteristic and persuasiveness ratings were the independent variables. In each regression, the pre-reading learner characteristic was entered first and the persuasiveness rating was entered second. This method of entry of the variables allowed for examination of whether the second independent variable (persuasiveness rating) accounted for a significant amount of variance in each post-reading learner characteristic above what the pre-reading learner characteristic already contributed to the variance. The significance of amount of variance readers' persuasiveness rating contributed was determined by examining the significance of the increase in the *r-squared* variable. The results of the regressions, as seen in Tables 12-15 below, allowed for exploration of the association between persuasiveness rating and a change in learner characteristics.

In the perceived knowledge regression, readers' persuasiveness ratings were found to be associated with an increase in their perceived knowledge. After controlling for pre-reading perceived knowledge, the persuasiveness ratings were significant

predictors of the increase in readers' perceived knowledge. Both pre-reading perceived

knowledge ($p = .000$) and persuasiveness rating ($p = .008$) contribute a significant

amount to the variance in readers' post-reading perceived knowledge (See Table 12,

Regression Analysis for Persuasive Rating of Text Prediction of Perceived Knowledge).

The adjusted *r-squared* value for the first model

Table 12

Regression Analysis for Persuasiveness Rating of Text Prediction of Perceived

Knowledge

	Unstandardized Coefficients		Standardized Coefficients
Variable	*B*	*SE B*	*ß*
Model 1			
Pre-reading perceived knowledge	.331	.081	.502**
Model 2			
Pre-reading perceived knowledge	.298	.077	.453**
Persuasiveness Rating of Text	.397	.143	.323**

Note: $r = .502$, $r^2 = .252$ for Model 1; $r = .594$, $r^2 = .353$ for Model 2.
** Significant at $p < .01$

(pre-reading perceived knowledge) is .237. The adjusted *r-squared* value for the second

model (pre-reading perceived knowledge and persuasiveness rating) is .327. There was a

significant change in the value of the adjusted *r-squared* ($F = .008$) with the addition of

the persuasiveness rating variable in the model. Therefore, controlling for pre-reading

perceived knowledge, readers' ratings of the persuasiveness of the texts were associated with an increase in their perceived knowledge.

In the demonstrated knowledge regression, readers' persuasiveness ratings were found to be associated with an increase in their demonstrated knowledge. After controlling for pre-reading demonstrated knowledge, the persuasiveness ratings were significant predictors of the increase in readers' demonstrated knowledge (See Table 13, Regression

Table 13

Regression Analysis for Persuasiveness Rating of Text Prediction of Demonstrated Knowledge

Variable	Unstandardized Coefficients		Standardized Coefficients
	B	*SE B*	*ß*
Model 1			
Pre-reading demonstrated knowledge	.486	.137	.448**
Model 2			
Pre-reading demonstrated knowledge	.538	.126	.495**
Persuasiveness Rating of Text	.056	.016	.396**

Note: $r = .448$, $r^2 = .201$ for Model 1; $r = .596$, $r^2 = .355$ for Model 2.
** Significant at $p < .01$

Analysis for Persuasive Rating of Text Prediction of Demonstrated Knowledge). Both pre- reading demonstrated knowledge ($p = .000$) and persuasiveness rating ($p = .001$) contribute a significant amount to the variance in readers' post-reading demonstrated

knowledge. The adjusted *r-squared* value for the first model (pre-reading demonstrated

knowledge) is .185. The adjusted *r-squared* value for the second model (pre-reading

demonstrated knowledge

and persuasiveness rating) is .328. There was a significant change in the value of the

adjusted *r-squared* (F = .001) with the addition of the persuasiveness rating variable in

the model. Therefore, controlling for pre-reading demonstrated knowledge, readers'

ratings of the persuasiveness of the texts were associated with an increase in their

demonstrated knowledge.

In the interest regression, readers' persuasiveness ratings were found to be

associated with an increase in their interest. After controlling for pre-reading interest, the

persuasiveness ratings were significant predictors of the increase in readers' interest (See

Table 14, Regression Analysis for Persuasive Rating of Text Prediction of Interest). Both

pre-reading

of the persuasiveness of the texts were associated with an increase in their interest.

interest (p = .000) and persuasiveness rating (p = .000) contribute a significant amount to

the variance in readers' post-reading interest. The adjusted *r-squared* value for the first

model (pre-reading interest) is .597. The adjusted *r-squared* value for the second model

(pre-reading interest and persuasiveness rating) is .696. There was a significant change in

the value of the

adjusted *r-squared* (F = .000) with the addition of the persuasiveness rating variable in

the

Table 14

Regression Analysis for Persuasiveness Rating of Text Prediction of Interest

	Unstandardized Coefficients		Standardized Coefficients
Variable	*B*	*SE B*	*ß*
Model 1			
Pre-reading interest	.707	.081	.778**
Model 2			
Pre-reading interest	.645	.072	.711**
Persuasiveness Rating of Text	.427	.103	.327**

Note: $r = .778$, $r^2 = .605$ for Model 1; $r = .841$, $r^2 = .707$ for Model 2.
** Significant at $p < .01$

model. Therefore, controlling for pre-reading interest, readers' ratings of the

persuasiveness of text were associated with an increase in their interest after reading.

Finally, in the beliefs regression, readers' persuasiveness ratings were found to be

associated with an increase in their beliefs. After controlling for pre-reading beliefs, the

persuasiveness ratings were significant predictors of the increase in readers' beliefs (See

Table 15, Regression Analysis for Persuasive Rating of Text Prediction of Beliefs). Both

pre- reading beliefs ($p = .000$) and persuasiveness rating ($p = .000$) contribute a

significant amount to the variance in readers' post-reading beliefs. The adjusted *r-*

squared value for the first model (pre-reading beliefs) is .453. The adjusted *r-squared*

value for the second model (pre-reading beliefs and persuasiveness rating) is .604. There

was a significant change in the

Table 15

Regression Analysis for Persuasiveness Rating of Text Prediction of Beliefs

| Variable | Unstandardized Coefficients | | Standardized Coefficients |
	B	*SE B*	*ß*
Model 1			
Pre-reading beliefs	.664	.101	.681**
Model 2			
Pre-reading beliefs	.479	.095	.491**
Persuasiveness Rating of Text	.506	.113	.438**

Note: $r = .681$, $r^2 = .464$ for Model 1; $r = .787$, $r^2 = .619$ for Model 2.
** Significant at $p < .01$

value of the adjusted *r-squared* ($F = .000$) with the addition of the persuasiveness rating

variable in the model. Therefore, controlling for pre-reading beliefs, readers' ratings of

the persuasiveness of the texts were associated with an increase in their beliefs.

In sum, the results of these multiple regression analyses found that readers'

ratings of the persuasiveness of the texts were associated with an increase in all four

learner characteristics. Persuasive ratings predicted an increase in readers' perceived

knowledge, demonstrated knowledge, interest and beliefs as a result of reading.

Elementary-aged readers' capacity to identify elements of persuasive text was associated

with a growth in each of the learner characteristics.

Conclusion

The data analyses produced several interesting findings related to the influence of

text and learner characteristics on the perceived persuasiveness of text. Text structure did

not independently influence elementary-aged readers' perceptions of the persuasiveness

of a text. Elementary-aged readers found the argument and explanation text structures to be equally persuasive.

The background that elementary-aged readers brought to the persuasive task--in this case, the learner characteristics of perceived knowledge, demonstrated knowledge, interest and beliefs--were positively related to their learner characteristics after reading. Several other relations of theoretical interest emerged. Elementary-aged readers' knowledge was related to their beliefs. The more readers knew the more they tended to agree with the stance of the author. Elementary-aged readers' perceived knowledge was related to their interest level. The less a reader felt they knew about the topic, the less interested they were. Readers' beliefs and interests after reading were related, as well.

Finally, the readers' learner characteristics and their rating of the persuasiveness of texts were associated. Elementary-aged readers' pre-reading beliefs, demonstrated knowledge, and interest predicted the most variance related to readers' rating of the persuasiveness of text. Readers' pre-reading beliefs, interests, and demonstrated knowledge, but not their perceived knowledge, predicted how persuasive they rated the texts. After reading, their beliefs and interests predicted the most variance in their ratings of the persuasiveness of the texts. Elementary-aged readers' interests and beliefs after reading, but not their perceived and demonstrated knowledge, predicted their ratings of the persuasiveness of texts.

The next chapter will summarize the study and situate these findings with other research. The limitations of the study will be addressed and implications for instruction and future research will be addressed.

CHAPTER V

SUMMARY, LIMITATIONS, AND DIRECTIONS

This study explored the interplay of fifth-grade readers' learner characteristics and their perceptions of the persuasiveness of text. Based on the interactive view of reading (RRSG, 2002; Rosenblatt, 1978; Stanovich, 1980) and the multi-faceted view of persuasion (Alexander et al., 1998; Buehl et al., 2001; Murphy, 1998) the text, the reader, and the purpose of the activity, in this case persuasion, were believed to interact and influence each other. An understanding of the interaction between elementary readers and persuasive text will further add to an understanding of young readers' processing of expository text. This chapter presents a summary of the major findings, limitations of the research study, and future research directions.

Summary of Findings

Argument and Explanation Structures Perceived as Persuasive

Text plays an important role in the reading comprehension process (RRSG, 2002). Recent research has found that text structure is one factor that influences the effectiveness of persuasive text with adult readers (Alexander et al., 1998; Buehl et al., 2001; Dole & Sinatra, 1998; Hynd et al., 1994; Guzzetti et al., 1993). This study explored fifth graders' perceptions of the persuasiveness of two text structures: argument and explanation.

Results of this study indicate that the argument structure and explanation structure were perceived as equally persuasive. Readers' ratings of the persuasiveness of each text structure were compared and no statistically significant differences were detected. This finding opens up the possibility that a variety of text structures may persuade young

readers, as has been proposed for adult readers (Chambliss, 1994; Chambliss & Garner, 1996). Children as young as kindergarten are able to process a variety of expository text strategically (Duke & Kays, 1998; Donovan & Smolkin, 2001). Elementary-aged readers are sensitive to text structure (Chambliss & Murphy, 2002; Hare et al., 1989; Williams et al., 2004). Therefore, a variety of text structures may be potentially persuasive to elementary-aged readers since they have the skills associated with processing and recognizing a variety of texts.

These findings support the assertion that author's purpose in argument and explanation text structures are similar. In an argument structure, the author's purpose is to use evidence and warrants to make and support a claim (Toulmin, 1958). In an explanation structure, the author's purpose is to address presumed gaps in readers' understanding about a topic (Chambliss & Calfee, 1998). It was believed that the two text structures shared similar author purposes, and the lack of a significant difference in the perceived persuasiveness of the two structures supports that notion. Argument and explanation structure aim to alter either readers' stance or understanding of a topic. Both of these text structures were judged to be persuasive by elementary-aged readers.

In addition to text structure, the content of the texts were cited by elementary-aged readers' as important considerations in their rating of the persuasiveness of text. Similar to research with adult readers (Murphy, 2001, 1998), fifth-grade readers in this study found certain characteristics of the texts more convincing than others. Murphy (2001) asked undergraduate students and a panel of experts their perceptions of persuasive text. Adult readers noted three text characteristics that they felt were effective in persuading them. The use of emotional appeals helped adult readers relate to the topic.

The inclusion of a wide variety of evidence was also cited as a factor in the veracity of the arguments presented in the texts they read. Finally, the presence of information that refuted what they believed to be true was considered to be persuasive.

Elementary-aged readers also cited evidence and information they found particularly convincing. These young readers felt that they could relate on a personal level to the information in both the argument and explanation texts. Emotional appeals, or evidence and examples that illustrated the detrimental effects of air pollution on humans were mentioned as the most convincing information. Readers cited evidence that connected with their experiences as most compelling. For example, evidence that illustrated the direct impact of air pollution on humans' health was deemed more important than evidence that explained the influence of air pollution on the atmosphere. Additionally, readers cited information that helped them feel as though they were in a particular situation compelling. For instance, the passage which asked them to imagine they were in a car on a hot day and that they rolled down the window and the air burned their eyes helped them recall similar situations. As with adult readers, these young readers considered emotional appeals or the information that related directly to their lives to be convincing.

The finding that young readers found information that appealed to their emotions to be important is consistent with interactive views of reading (RRSG, 2002; Rosenblatt, 1978; Stanovich, 1980) and persuasion (Alexander et al., 1998; Buehl et al., 2001, Murphy, 1998). In this study, readers found both texts to be persuasive, in part, because they both contained information to which they could relate. Both texts contained information that explicitly mentioned the ramifications of air pollution on the reader and

other people. Several of the readers who participated in the retrospective verbal reports said they knew people with asthma and, as a result, they related to the information in the text. The background and experiences of readers—whether they knew others with a lung disease or had experienced firsthand the burning effects of smog as they rode in a car-- were cited by readers as the most convincing information in the text. The importance of linking information in the text to readers is necessary for comprehension as well as for persuasion.

Relations Among Learner Characteristics

In addition to the text, the individual characteristics that each reader brings to a text are important influences in the reading process (RRSG, 2002). Research with adult readers has found that learner characteristics, such as perceived knowledge, demonstrated knowledge, interest, and beliefs to be influential in the persuasion process (Alexander et al., 1998; Buehl et al., 2001; Murphy, 1998). Exploration of the relations of elementary- aged readers' learner characteristics as they read persuasive text allows for an understanding of the interaction of persuasive text and readers' learner characteristics.

The learner characteristics of demonstrated knowledge, perceived knowledge, interest, and beliefs were found to be related in various ways. As was expected, learner characteristics were positively and significantly related across pre- and post-reading tasks. In addition to these significant correlations, relations of interest among learner characteristics existed. From these, several findings emerged concerning the relations of young readers' learner characteristics as they processed persuasive text.

Readers knew what they knew. Readers were aware of the amount of knowledge they possessed about the text topic. There was a significant correlation between what

readers knew before reading and what they thought they knew. For example, those readers with low demonstrated knowledge had low perceived knowledge. The ability of readers to accurately assess the amount of knowledge they possessed demonstrates how aware these young readers were of their capabilities and limitations.

Knowledge and agreement with the author were related. Readers' demonstrated knowledge before reading was related to their beliefs before reading. Before reading, the more readers knew about a topic the more likely they were to agree with the stance of the author both before and after reading. This relation between readers' knowledge and beliefs indicates that knowledge plays a role in beliefs and vice versa (Eagley & Chaiken, 1993; Nickerson, 1991). The relation between belief levels or agreement with the stance of the author and knowledge has been found with adult readers (Alexander et al., 1998; Buehl et al., 2001). The more knowledge high-school students gained from text, the more likely they were to alter their beliefs to align with those of the author (Showers & Shrigley, 1995). Knowledge and beliefs are also related in elementary-aged readers. This relation illustrates that the phenomenon of case-building (Nickerson, 1991) exists with elementary-aged readers, too. These young readers tended to agree with a stance that aligned with the knowledge they had acquired before reading the texts in this study. The amount of knowledge a young reader possessed was positively related to their beliefs or agreement with the author's stance.

The relation of knowledge and beliefs was not put to the test with these texts. The author's stance in both texts was not controversial. The stance adhered to the scientific convention that air pollution is damaging to the Earth and everything on it. The belief statements aligned with conventional knowledge as well as with the stance of the author.

Had the stance been more controversial or less conventional, the relation between knowledge and beliefs may not have existed. Murphy (1998) found that adults' profiles changed based on the topic of the text, so for adults, topic plays an influential role. If the stance in the text did not align with conventional knowledge or the belief statements, a relation still may have existed because readers may have become more entrenched in their beliefs, not the beliefs of the author. However, research with older readers has also found a link between knowledge and belief levels (Alexander et al., 1998; Buehl et al., 2001; Showers & Shrigley, 1995), so a relation may have existed, despite the topic or author stance. The knowledge of the readers and the information contained in the texts aligned well enough for the two characteristics to be related.

Elementary-aged readers' perceived knowledge before they read was related to their beliefs before and after they read. This finding is similar to recent research, which found that the more perceived knowledge adult readers' felt they had the higher their beliefs (Buehl et al., 2001). Those adult readers with high perceived knowledge were more likely to maintain their agreement with the stance of the author. Similarities can be drawn, however, between the work with adults and elementary-aged readers in that perceived knowledge and beliefs are related. The more elementary-aged readers thought they knew about the topic prior to reading, the higher their beliefs before and after reading. This indicates that the knowledge elementary-aged readers felt they brought to the task of reading was related to their agreement with the stance of the author.

Knowledge and interest were related. Readers' perceived knowledge before they read was related to their interest before and after reading. Readers who did not feel they knew a lot about the topic before reading were not overly interested in the topic. Those

readers who felt they knew a great deal about the topic were interested in the topic. This relation is logical--if readers did not feel they knew much about a topic, they would not be interested in the topic. Interest, as defined in this study, was text-based interest which is considered a type of situational interest (Hidi, 1990). The situational nature of this particular type of interest would explain the relation between perceived knowledge and interest, because text-based interest can be short-lived and spurred by the text. Situational interest could also be spurred by individuals' perceptions of their own knowledge. Additionally, research on adults' persuasion processes has found a relation between knowledge, interest, and adult readers' level of persuasion (Alexander, Buehl, & Sperl, 2001). Knowledge and interest are related in adults' persuasion process. The relation between perceived knowledge and interest speaks to the power of perception. Elementary-aged readers' perception of how much they knew about the topic influenced their interest in the topic.

Note the various relations that exist between beliefs, interest, and the two knowledge measures. Readers' demonstrated knowledge before reading and their interest level after reading were not correlated. However, readers' demonstrated knowledge and beliefs were correlated. On the other hand, perceived knowledge and interest were related, thus illustrating the power of perception. While the knowledge readers possessed about the topic was related to their agreement with the stance of the author, the knowledge readers *thought* they had was related to how interested they were in the topic.

Interest and beliefs were related. Finally, readers' beliefs and interest after reading were correlated. This relation also seems logical-- the more readers were interested in a topic, the more likely they were to agree with the stance of the author after

reading. The same relation has been found to exist with adult readers—the more interest they had in the topic the more likely they were to agree with the stance of the author (Alexander et al., 1998). A reader who finished the text with a heightened level of interest in the topic was more likely to agree with the stance of the author.

In conclusion, the relations among the various learner characteristics shed light on the relations between elementary-aged readers' background and text. Many of the relations explored echoed findings with adult readers (Alexander et al., 1998; Buehl et al., 2001; Murphy, 1998; Nickerson, 1991; Showers & Shrigley, 1995). These data contribute to an initial understanding of the interplay of elementary readers' learner characteristics before and after they read persuasive text. The relations among fifth-grade readers' learner characteristics were varied. First, readers displayed a keen awareness of their knowledge. Readers' perceived knowledge level was related to their demonstrated knowledge level. Second, readers' demonstrated knowledge about the topic was related to their agreement with the stance of the author. Third, readers' perceived knowledge before and after reading was related to their interest before and after reading. Finally, readers' beliefs and interest after reading were related. The more a reader was interested in a topic, the more likely they were to agree with the stance of the author.

Associations Between Learner Characteristics and Perceptions of Persuasiveness

Studies conducted with adult readers have found that knowledge and beliefs have played an influential role in persuasion (Alexander et al., 1998; Buehl et al., 1998; Johnson et al., 1995; Kardash & Scholes, 1995, 1996; Murphy, 1998). Adult readers were reluctant to abandon their knowledge and beliefs after reading text which refuted either

their knowledge or beliefs. While the current study did not directly explore the persuasion process of young readers, similarities can still be drawn.

In order to explore the influence of readers' learner characteristics on fifth graders' reading of persuasion, two sets of multiple regression analyses were conducted. The first multiple regression analyses revealed that readers' beliefs, demonstrated knowledge and interest before reading predict readers' ratings of the persuasiveness of text after reading. After reading, readers' beliefs and interests predict their ratings of the persuasiveness of text. These findings are similar to previous work with adults that found knowledge, interest, and beliefs influential in adults' persuasion process (Alexander et al., 1998, 2001; Buehl et al., 2001; Murphy, 1998). The knowledge, interests, and beliefs that young readers' had before reading predicted their rating of the persuasiveness of text.

The second set of regressions found that readers' rating of the persuasiveness of the texts was associated with an increase in all four learner characteristics. Elementary-aged readers' ability to identify certain elements of text they found persuasive was associated with a growth in perceived knowledge, demonstrated knowledge, interests, and beliefs. While previous work has not explored the association of readers' persuasive rating on their increase in learner characteristics, the association makes sense. Research with adults has found knowledge, interest, and beliefs associated with the persuasion process (Alexander et al., 1998, 2001; Buehl et al., 2001; Murphy, 1998). In addition, the findings from the set of regressions reported earlier also found learner characteristics and persuasive rating to be associated. This regression, however, illustrates the association between readers' rating of the persuasiveness of the texts and an increase in their learner characteristic levels.

Limitations

There are several notable limitations to the study. First, the study was conducted at one school, which limits the scope of the findings. The decision to collect data at one site was based on this researcher's capacity to carry out the study. The use of more school sites may have produced different results because of the approach to literacy instruction or the student population at each site. A larger number of schools would allow for further exploration of a wider variety of fifth graders' reading of persuasive text. Teachers, schools, and districts have certain curricular or instructional foci which may influence readers' ability to analyze text, experience with persuasion, and topic knowledge, to name a few. A wider variety of schools or districts would allow for exploration of the reading of persuasive text of students with various academic experiences and background.

Second, the study involved participants from one grade level. The decision was made to focus on fifth grade as a starting point for this exploratory study. Presumably, since developmental differences have been found in children's ability to argue and persuade (Stein & Miller, 1991), developmental differences may exist with regard to reading and interpreting persuasive texts. The results from this study can be applied to fifth-grade readers of average reading ability; however, to gain a comprehensive understanding of elementary readers' process of reading persuasion, students from a broad spectrum of elementary grades will need to be studied.

Third, the sample size for the study was small by quantitative standards. The statistical analyses employed were limited by the small sample size. A larger sample size would be ideal for future studies. As mentioned previously, a larger sample size from

more schools and a variety of grade levels would lead to a better understanding of the influence of persuasive text on a diverse population of young readers. The results would not be situated at one school, one grade level, one district, but rather would shed light on the influence of a wide variety of elementary-aged readers' learner characteristics on their perceptions of persuasive text. A larger sample size would presumably lead to findings that could be generalized more easily based on the variety of teacher, instructional, socioeconomic, and ethnic representation a larger sample would hopefully provide.

Fourth, the topic of the text was not overly controversial and aligned perhaps too closely with readers' pre-reading stance on air pollution. While it may not be desirable to engage young readers on controversial topics, a topic about which readers may have had more of a misconception may have produced different results. In this study, readers generally agreed with the stance that air pollution is dangerous before reading. While readers may have seen air pollution as more of a wide-reaching threat after reading, overall their view of air pollution changed very little. A topic about which readers may have had a misconception may have produced different results, or at least allowed for exploration of changes in beliefs based on information that may not align with their knowledge. Many studies with adult readers have focused on controversial topics, such as assisted suicide, which has allowed for more of a direct exploration of the influence of the text on readers' beliefs (Alexander et al., 1998; Buehl et al., 2001; Murphy, 1998). The alignment of readers' beliefs with those of the author in the current study did not allow for that type of exploration.

Fifth, only two text structures, argument and explanation were used in the study. The results from this study illustrate that a variety of text structures may be persuasive.

By selecting a starting point of two text structures for this exploratory study, the results are limited to only those structures. The use of two texts written in either the argument or explanation structure is a limitation.

Also, only two texts were employed in the current study. Having readers read multiple texts written in particular text structures may have led to different findings. If readers had read a total of 10 texts, 5 written in the explanation structure and 5 written in the argument structure, a clearer picture of the influence of these text structures on young readers may have emerged. The use of only two texts is a limitation and should be considered in future studies.

Finally, the reliability scores of several items are a limitation. In particular, the demonstrated knowledge and belief measures were lower than hoped. While the current study is exploratory and reliability scores below .80 are generally not acceptable (Pedhazur, 1997), reliability scores grater than .80 would have been desirable. The measure overall had a high reliability score (.897) but specific items had scores below .80.

Despite these limitations, this exploratory study established that text and learner characteristics do influence fifth-graders' reading of persuasive text. Argument and explanation structures were considered equally persuasive by these young readers. The beliefs, interest, and knowledge readers bring to the task of reading persuasive texts play an influential role in their perceptions of persuasiveness.

Future Research Directions

Based on the results of this study, several research directions are noteworthy. As stated earlier, the influence of persuasive text on elementary readers is largely

unexplored. In order to gain a more complete understanding of the influence of persuasive text, on a wide variety of elementary readers, larger sample sizes as well as readers from different grade levels should be included in future studies. There are developmental differences in children's oral use of argument and persuasion (Stein & Miller, 1991; Weiss & Sachs, 1991). Therefore, developmental differences presumably exist in children's reading of persuasion. A look at readers of a variety of ages will help identify what readers need to support them into developing into critical, thoughtful readers. Exploratory studies using similar methods as the current study with a variety of readers would allow for a continuum of the influence of text and learner characteristics on a variety of readers to emerge. Additionally, cross-sectional studies, which investigated a large sample with several age groups concurrently, could be conducted.

The use of a topic that is more controversial or about which readers may have misconceptions would be of interest. The influence of a persuasive text that does not align with most readers' point of view would allow for exploration of how these readers accommodate information that does not align with their point of view. Adults tend to adhere to their own beliefs and are reluctant to abandon their beliefs as a result of reading (Alexander et. al., 1998; Murphy, 1998). It would be interesting to see whether the same holds true for young readers, do they abandon their beliefs based on what is read, or do the adhere despite reading something to the contrary. Presumably, not everything young readers encounter aligns with their beliefs. An understanding of how they accommodate information that is contrast to their notions would be a great contribution.

In addition to a more controversial topic, asking young readers to evaluate and compare the persuasiveness of texts with differing stances on the same issue would be

informative. This would allow researchers to further understand not only how readers are influenced by text that they agree with, but how do young readers deal with text that runs counter to what they know? Are they able to effectively question and critique the text, or do they accept what they read? Exploration of these differences is important in developing an understanding of how to foster the critical thinking skills necessary to evaluate persuasive texts.

This study looked at the persuasiveness of two text structures, explanation and argument. The conclusion was that both were equally persuasive; yet, there are countless other text structures which are potentially persuasive. Exploration of the persuasiveness of other text structures is warranted based on the findings of the current study.

Finally, there are several directions in which the reading and writing of persuasion could be linked in future research. With an understanding of young readers' perceptions of persuasive text, there may be an important link in the reading, evaluating, and writing of persuasive text. Intervention or exploratory studies which documented a potential link between facility with reading and writing persuasive text may be productive. In addition, exploration of children's use of a variety of text structures to persuade might be a natural off-shoot of the current study. Based on the perceptions of readers that argument and explanation were equally persuasive, young writers may be able to use a variety of text structures in composition of persuasive text.

<div align="center">Conclusion</div>

The current study found that fifth-grade readers found argument and explanation text equally persuasive. Learner characteristics were related in a variety of ways before and after reading persuasive text. Finally, learner characteristics were associated with

readers' perceptions of the persuasiveness of text and persuasive ratings were associated with an increase in readers' learner characteristics.

This study scratched the surface as far as understanding the influence of persuasive text on young readers. More research is needed to explore more fully the influence of persuasive text on young readers. There is little doubt that young readers will continue to need the skills of evaluating and critiquing the persuasive messages they will encounter. A more comprehensive understanding of how text influences these young readers will allow educators to promote the sophisticated, critical reading skills necessary to meet the challenges of an information-based society.

APPENDIX A
Research Questions and Data Sources

	Research Question	Independent Variables	Dependent Variables	Qualitative Data	Data Analysis
Text	In what ways do fifth-grade readers differentially perceive the persuasiveness of argument and explanation structures?		Paired variables-composite persuasiveness ratings for argument and explanation structures	Retrospective Verbal Report Data	Dependent Paired Sample T-test
Students	What is the relation between fifth-grade readers perceived knowledge, demonstrated knowledge, interests, and beliefs prior to and after reading persuasive text?		- Readers' pre-reading responses to perceived knowledge, demonstrated knowledge, belief, and interest items - Readers' post-reading responses perceived knowledge, demonstrated knowledge, belief, and interest items	Retrospective Verbal Report Data	Correlation analyses (demonstrated knowledge, perceived knowledge, beliefs, and interest)
Interaction	In what ways are perceptions about the persuasiveness of text associated with fifth-grade readers' perceived knowledge, demonstrated knowledge, interest, and beliefs?	- Learner characteristics - Pre-reading learner characteristics & persuasive ratings	- Composite of text persuasiveness items - Post-reading learner characteristics		Multiple Regression

Appendix B
Highlights of Pilot Study

A pilot study was conducted in early February 2006 to determine the developmental appropriateness of the texts and instruments to be used in the current study. Four fifth-grade students were recruited to participate in the pilot study. Two of these students were females. Each student completed the interview task in procedures closely related to those employed in the current study. Each reader first (1) completed a pre-reading learner characteristics questionnaire, (2) then read one of the texts, (3) completed a persuasiveness rating sheet for the text they just read, (4) read the other text, (5) completed a persuasiveness rating sheet for the text just read, (6) and finally they completed a post-reading learner characteristics questionnaire. Two of the readers (one female and one male) were selected to participate in the retrospective verbal report after reading each of the texts. The table on the following page shows the data obtained from the pilot study.

Based on the pilot study, a few modifications were made to the instruments and procedures. One item on the belief questionnaire was re-worded because three out of the four students asked the researcher for clarification for the item as they were completing the task. The re-worded item did not pose an issue for those participants in the current study because they did not ask for clarification. Additionally, it was determined that the task could be administered in a small group setting (two students and one researcher) as opposed to one-on-one. Other than these minor modifications, the instruments, materials, and procedures were deemed developmentally appropriate based on the fact that students were able to independently complete and read all material.

APPENDIX C

Parental Consent Form

February 2006

Dear Parents or Guardians,

I am a doctoral student at the University of Maryland, College Park and am conducting a research study that examines persuasion and persuasive text. I am requesting permission for your child to participate in the study.

If you grant permission, I will meet individually with your child for one 30-to 45-minute session. During this session your child will read two persuasive texts and answer interview questions related to their opinions of the persuasiveness of the texts. In addition, several students will be selected to participate in an interview, which will be audio-taped.

Your child's participation in this study is voluntary. You are welcome to ask questions and may withdraw you child from participation at any time. The data I collect will remain confidential. I will not identify your child by name. Each audio-tape will be destroyed upon completion of the data collection process. The data collected will be grouped with other fifth-grade children to provide data for reporting. This data will be available to you and your child's classroom teacher upon request.

Please complete the form below and return it to school with your child. If you have any questions, please contact me at (301)592.1671 or at jesspalladino@comcast.net or my advisor, Dr. John O'Flahavan at (301)405.3149.

Sincerely,

Jessica Palladino

Please complete this for and return it to your child's classroom teacher.

___ I grant permission for my child to participate and be audio-taped should they participate interview sessions.

___ I do not grant permission for my child to participate and be audio-taped should they participate in the interview sessions.

| Name of child | Signature of Parent/Guardian | Date |

Appendix D
Texts
The Dangers of Air Pollution (Argument)

Air pollution is an important issue that threatens all living things on the Earth. Water pollution and pollution of the land are dangerous but no threat is as dangerous as the pollution of the air. Air pollution releases harmful chemicals into the air. Human beings and other living beings on Earth breathe these harmful chemicals every day. These chemicals cause many health problems in humans and all living things. For these reasons, air pollution is a threat to all living things on Earth and a problem that must be solved.

Carbon Dioxide and the Atmosphere

Air pollution is a major concern because it releases harmful chemicals into the air. These chemicals attack and damage the atmosphere, or the blanket of air that surrounds the Earth. One chemical that pollutes the air is carbon dioxide. Carbon dioxide is released from cars, trucks, and most vehicles. Carbon dioxide is also formed by many other machines, such as those found in factories and even in people's homes.

Carbon dioxide is a dangerous gas because it can damage the atmosphere. More specifically, too much carbon dioxide in the air can damage something called the *ozone layer* which lies about 10-30 miles above the Earth's surface. The ozone layer performs an important function in that it protects the Earth's surface from the sun's harmful ultraviolet rays. If the ozone layer is damaged, the sun's rays will reach the Earth and hit all living things and can cause them harm. Too much carbon dioxide in the air can cause holes to develop in the protective ozone layer and can harm all living things.

Acid Rain

Air pollution is also dangerous because it causes *acid rain*. Acid rain forms when airborne pollution reacts with the water and the oxygen in the atmosphere. The pollution in the air and the water and oxygen combine to form acid rain. Acid rain is very harmful to living things on the Earth. Acid

rain can kill many plants and trees. Acid rain will kill crops, forests, and pollute the soil. This is a major concern for all humans because many of the farms we get our food from might be exposed to acid rain. Acid rain might cause crops to be damaged. Acid rain is also dangerous because it can enter lakes, rivers, and ponds and pollute the living species in there.

Air pollution can have many dangerous effects on the Earth. Carbon dioxide can damage the ozone layer, which will cause harmful rays from the sun to reach the surface of the Earth. Air pollution can also cause acid rain, which can damage the habitat of many living creatures as well as plants and forests we rely on for food.

Human Health and Air Pollution

Air pollution causes many health problems in humans. The gases and chemicals that pollute the air are breathed in by humans each and every day. As a result of air pollution, humans have a variety of illnesses.

Breathing polluted air can irritate people's nose, eyes, and throat. This is an immediate effect of air pollution, but there are many long term effects of breathing polluted air. Many people who are exposed to pollution in the air develop illnesses related to their breathing or respiratory system. For example, illnesses such as asthma, lung disease, bronchitis, and pneumonia can develop as a result of exposure to air pollution. These diseases do not have a cure. Instead they are what are called chronic diseases, which means that the person with the disease must learn to live with and manage the disease. The development of these chronic diseases can often be directly linked to air pollution. One reason that air pollution is such a major concern is that it is causing diseases in humans.

Who Gets Sick?

The diseases associated with air pollution are most likely to develop in our most vulnerable citizens, children and the elderly. This is an important health concern, but one that is preventable if air pollution is reduced.

The lungs and respiratory system of children are still developing and are therefore more likely to be affected by air pollution. Senior citizens or the elderly are older and weaker so their respiratory systems are likely to be affected too. Treatment of the illnesses related to air pollution, asthma, lung disease, bronchitis, and pneumonia is very expensive. Also, these diseases do not usually go away, so treatment of these diseases usually lasts the entire lifetime of the individuals who get sick.

Even those people who do not live in areas with a lot of air pollution can be affected by air pollution. Air pollution and acid rain can be blown hundreds or thousands of miles. Therefore, air pollution is a concern for the health of everyone and something we all need to take immediate action to help.

The Dangers of Air Pollution

Air pollution is a major threat to the health of all living beings on Earth. Air pollution is damaging the Earth's atmosphere. Air pollution is also causing acid rain to develop, which can pollute the water we drink and the food we eat. The health effects of air pollution are very serious for humans. Humans can develop life-threatening diseases after being exposed to air pollution.

The problem of air pollution is one that is very important to every living being in the world. Scientists are working on developing technologies to help reduce air pollution, but unless every person accepts that air pollution is a major threat, air pollution will remain a dangerous problem.

[925]
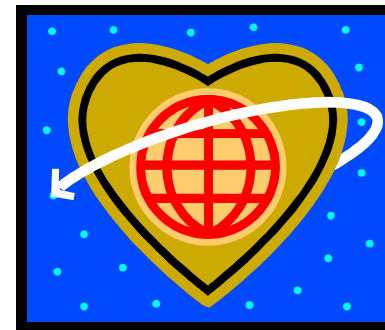
What Causes Smog? (Explanation)

In Los Angeles, children often have to play indoors. Little League games are canceled. High school football teams have to play in the gym. In Mexico City, people are only allowed to drive their cars on certain days of the week. The problem in all of these cities is *smog*. Smog makes people's eyes water and it irritates the lining of the nose, throat, and lungs. It can make older people, babies, and people with lung diseases like asthma very sick. It can even cause death. On days when smog is very bad, people who could be harmed by smog are told to stay indoors. What causes smog?

The Air We Can See

We live at the bottom of a blanket of air that reaches from earth to outer space. There are 5,700,000,000,000,000 tons of air, or *atmosphere*, blanketing the earth. We cannot see clean air. When air moves, we can feel it. We can see what happens when the wind blows and air moves. A gentle wind rustles leaves. A strong wind makes trees sway back and forth. Moving air can be very powerful. With that much air around, it is not surprising that for many years people treated the atmosphere like a bottomless garbage pail. However, smoke, dust, poisonous gases, and other pollutants do not really go away. They stay in the air. When the pollution becomes bad enough, we can actually see the air. Polluted air is dirty air.

Smog is one type of air that we can see. The word smog comes from a combination of two other words:

SMOKE and FOG

If you were to go to the top of a hill or mountain and look down at a nearby city, you would probably see a gray or brownish haze hanging over the city like a fog. Cities, of course, are places

where thousands of people live and work. In the winter, the smoke from chimneys pours into the air from the burning oil, gas, coal, and wood. Their cars spew exhaust fumes into the air. The factories where they work create smoke that adds to the pollution. Because all these sources of pollution are close together in a city, smog is worse in cities. What turns the exhaust and smoke from all these sources into smog?

Smoke and Sunlight

Imagine riding along in your car. In order to run, your car burns gasoline in the engine. The burned gasoline leaves the engine as exhaust fumes that come out of a pipe at the back of your car. Traffic is heavy. Exhaust is also coming out of the tailpipes of all the cars around you. As you drive along, you notice a tall smoke stack towering above a large factory next to the road. Smoke pours out of the factory into the sky. It is a very hot day. You roll down the window of your car to cool off and your eyes begin to burn from the smog.

The exhaust and chimney smoke have not become smog all by themselves. When sunlight strikes the exhaust fumes and smoke, chemicals in the fumes and smoke first break apart and then come back together as new gases. One of the most important of these new gases is *ozone*. Ozone stings the eyes, makes us cough, and harms our lungs. Because sunlight helps form ozone, smog is worse on sunny, hot days than on cloudy, cold days.
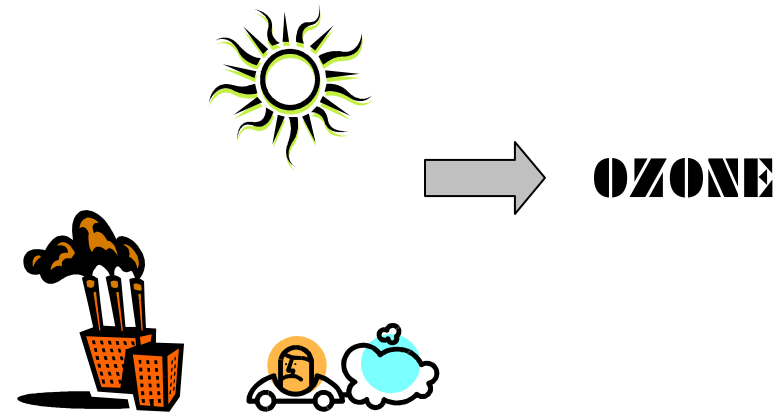
Hills and Valleys

It is easy to understand why smog forms in cities. But not all cities have bad smog. Why is smog worse in some cities than in others?

Cities with bad smog sit in valleys surrounded by mountains, kind of like a bowl. Warm air at the top of the bowl can act like a lid keeping the smog trapped over the city. Normally, cool air rises and moves around, carrying pollution with it. The pollution spreads out away from the city, and no smog forms. But, when warm air traps the cool air in the valleys the air cannot blow away the pollution. The pollution is caught over the city. If it is a hot, sunny day, the sunlight interacts with the pollution causing smog to become thicker and thicker as each day passes. Long periods of very heavy air pollution have been called "killer fogs" because they have caused sickness and death.

What Causes Smog and What Can We Do?

Cities are crowded. Automobiles, factories, and chimneys from people's homes all release smoke into the air. Sunlight causes chemicals in the smoke to break apart and come back together as ozone, or smog.

What is being done to reduce air pollution? All cities are working hard to find ways to keep pollutants out of the air so sunlight will not be able to turn pollutants into smog. Cities have created safe sidewalks and crosswalks for pedestrians. These are designed to encourage people to walk to their local stores or parks instead of driving. Laws have been passed to reduce the amount of chemicals factories can release into the air.

What can you do to help reduce air pollution? You could encourage your family and friends to drive less as a way to cut down on smog. Also, you and your family could use public transportation, like the metro or buses. These public transportation options would allow you to drive less. These and other steps will cut down on the amount of smog that is formed and reduce air pollution.

(918)

Appendix E
Graphic Organizers

Explanation Graphic Organizer

Phenomenon:

| Introduction |

| Little league games canceled | Mexico City, limit to driving | Football teams play in gym |

All Caused by Smog

Smog affects people's health

What causes smog?

Scientific
Concept

Atmosphere- air blanketing the Earth	We cannot see clean air, but can feel it moving around us	People carelessly put pollutants (smoke, dust, gas) in the air which makes the air polluted
Smog is one type of polluted air	Smog, or dirty air can often be seen in cities as a brown or hazy cloud	All the people, their cars, heating their homes, factories all contribute to the fact that there is more smog in cities

What turns exhaust and smoke into smog?

Scientific Model

Sub-example:
Imagine riding in a car, buildings, traffic, factory, exhaust, smoke, roll down the windows-your eyes burn

Exhaust from chimneys and cars	Struck by sunlight	Chemicals in fumes break apart and form new gases	Ozone one of new gases formed

Ozone stings eyes, makes us cough, hurts lungs

Scientific Concept

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│   │           Why is smog worse is some cities than in others?           │  │
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│   │ valleys,         │     │ out of the city, │     │ pollution is     │    │
│   │ surrounded by    │     │ taking the       │     │ trapped and      │    │
│   │ mountains        │     │ pollution with it│     │ cannot spread    │    │
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│ Conclusion                                                                   │
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│           │        What causes smog and what can we do?      │              │
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│            ┌──────────────────────────────────────────────┐                 │
│            │      Summary of causes and formation of smog │                 │
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│              │ Cities are taking steps to reduce smog: │                    │
│              │    -   Laws on emissions                │                    │
│              │    -   pedestrian safety                │                    │
│              │    -                                    │                    │
│              └────────────────────────────────────────┘                     │
│                                 │                                            │
│                                 ▼                                            │
│              ┌────────────────────────────────────────┐                     │
│              │ Steps reader can take:                  │                    │
│              │    -   drive less, walk more            │                    │
│              │    -   use public transportation        │                    │
│              └────────────────────────────────────────┘                     │
└────────────────────────────────────────────────────────────────────────────┘
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Argument Graphic Organizer

Carbon dioxide can damage the ozone and cause holes to develop, which allows harmful radiation to reach the earth's surface *(Evidence)*

Carbon dioxide also causes acid rain, which harms plants and animals *(Evidence)*

Anything that is harmful to humans' health is a problem *(Implicit warrant)*

Air pollution is a problem *(Claim)*

Exposure to air pollution can irritate the eyes, nose, and throat *(Evidence)*

Exposure to air pollution can cause people to develop asthma, lung disease, bronchitis, or pneumonia *(Evidence)*

Children and the elderly are most susceptible to the effects of air pollution. Treatment of illnesses associated with air pollution is expensive and most are chronic, the person has the illness for the rest of their lives *(Evidence)*

Appendix F
Student Response Sheet

Environmental Questionnaire

Please indicate how much you know about air pollution by placing a mark along the continuum below.

How much do you think you know about air pollution?

Nothing   _A lot_

For each item below circle the <u>one</u> answer that answers each question.

1.   Air pollution can be caused by:
      a)   too much carbon dioxide in the air
      b)   too much oxygen in the air
      c)   the use of air conditioners
      d)   farming

2.   Air pollution can cause all of the following EXCEPT:
      a)   health problems in humans
      b)   forests to decline or die
      c)   acid rain to form
      d)   less rain to fall

3.   The rise of the temperatures on Earth is known as:
      a)   climate
      b)   global warming
      c)   ozone
      d)   weather

4.   Ozone is formed when:
      a)   the temperatures are cold
      b)   people have fires in their houses
      c)   sunlight hits pollutants in the air
      d)   forests are cut down

5.   Which place would most likely have the highest level of air pollution?
      a)   a small town with a factory
      b)   a crowded, busy city surrounded by mountains
      c)   a farm that uses pesticides
      d)   a crowded, busy city surrounded by flat land

6. All of the following emit pollutants into the air EXCEPT:
    a) littering
    b) cars
    c) factories
    d) airplanes

7. When airborne chemicals are put into the air and they react with sunlight what substance is formed?
    a) oxygen
    b) smoke
    c) hydrogen
    d) smog

8. The ozone that exists 10-30 miles above the Earth's surface is:
    a) harmful to us
    b) protecting us from the sun's harmful ultraviolet rays
    c) killing farms and crops
    d) not affecting us at all

9. Air pollution:
    a) can be blown hundreds of miles and spread out
    b) does not harm humans
    c) is not affecting the environment
    d) is caused only by factories and other plants that give off smoke

10. The US government is taking steps to reduce air pollution by:
    a) making it illegal to drive on certain days
    b) asking people to recycle
    c) giving tax breaks to people who walk or ride bikes to work
    d) setting limits on the amount of chemicals that factories can release into the air

11. Smog can cause each of the following EXCEPT:
    a) stomach pain
    b) asthma problems
    c) irritation of nose, eyes, and throat
    d) breathing problems

12. Air pollution is worse during the:
    a) spring
    b) summer
    c) fall
    d) winter

13.   The blanket of air that surrounds the Earth is called the:
     a)   atmosphere
     b)   climate
     c)   biosphere
     d)   environment

14.   Steps to reduce air pollution include all of the following EXCEPT:
     a)   driving less
     b)   put more oxygen in the air
     c)   have factories give off less chemicals into the air
     d)   using public transportation

15.   Ozone is worse on hot, sunny days because:
     a)   more people are driving
     b)   trees cannot remove the carbon dioxide from the air
     c)   sunlight helps form ozone
     d)   ozone only forms in hot weather

Interest Measures

Please indicate how much you agree or disagree with each statement below by placing a mark along the line below each statement. There is not a right or wrong answer.

1. I watch television programs or movies about environmental issues like pollution, global warming, nature, or the environment.

_____

Strongly   *Strongly*
disagree   *agree*

Please write the names of any of the programs or movies you have seen that relate to pollution, global warming, nature, or the environment:

2. I would like to learn about ways to reduce pollution or other environmental issues.

_____

Strongly   *Strongly*
disagree   *agree*

3. I try to save water by turning off the water while I brush my teeth or limiting how long my shower is.

Strongly   _Strongly_
disagree   _agree_

4. I am careful to recycle items such as paper, glass, and plastic at home, school, or elsewhere.

Strongly   _Strongly_
disagree   _agree_

5. I read books or articles about environmental issues like pollution, global warming, nature, or the environment.

Strongly   _Strongly_
disagree   _agree_

Please write the names or author of any of the books or articles you have read that relate to pollution, global warming, nature, or the environment:

6. I save electricity by turning of lights and other electronics like the television when I leave a room.

Strongly   _Strongly_
disagree   _agree_

Belief Measures

1. Air pollution is only caused by factories.

_____

Strongly   *Strongly*
disagree   *agree*

2. Regular people's actions will not solve environmental problems.

_____

Strongly   *Strongly*
disagree   *agree*

3. Air pollution does not affect people's health.

_____

Strongly   *Strongly*
disagree   *agree*

4. The health of the environment is something that everyone should take steps to
    help.

_____

Strongly   *Strongly*
disagree   *agree*

5. There are steps each individual can take to stop harming the environment.

_____

Strongly   *Strongly*
disagree   *agree*

6. Air pollution can harm living beings.

_____

Strongly   *Strongly*
disagree   *agree*

Persuasiveness Rating System

1. I care about what the author said in this text.

Strongly   *Strongly*
disagree   *agree*

2. The author helped me understand air pollution.

Strongly   *Strongly*
disagree   *agree*

3. The author included information in the text that seemed real to me.

Strongly   *Strongly*
disagree   *agree*

4. The author helped me think about air pollution differently.

Strongly   *Strongly*
disagree   *agree*

5. The examples that the author used in the text seemed real and helped me
    understand the text.

Strongly   *Strongly*
disagree   *agree*

6. I agree with what the author was saying in the text.

Strongly   *Strongly*
disagree   *agree*

7. The author included a lot of information in the text that connects with information
    I already knew.

Strongly   *Strongly*
disagree   *agree*

8. The evidence that the author used in the text seemed real and important to me.

Strongly   *Strongly*
disagree   *agree*

Appendix G
Demonstrated Knowledge Measure and Text Correspondence

Both	1. Air pollution can be caused by: a) too much carbon dioxide in the air b) too much oxygen in the air c) the use of air conditioners d) farming
Both	2. Air pollution can cause all of the following EXCEPT: a) health problems in humans b) forests to decline or die c) acid rain to form d) less rain to fall
Argument	3. The rise of the temperatures on Earth is known as: a) climate b) global warming c) ozone d) weather
Explanation	4. Ozone is formed when: a) the temperatures are cold b) people have fires in their houses c) sunlight hits pollutants in the air d) forests are cut down
Explanation	5. Which place would most likely have the highest level of air pollution? a) a small town with a factory b) a crowded, busy city surrounded by mountains c) a farm that uses pesticides d) a crowded, busy city surrounded by flat land
Both	6. All of the following emit pollutants into the air EXCEPT: a) littering b) cars c) factories d) airplanes
Explanation	7. When airborne chemicals are put into the air and they react with sunlight what substance is formed? a) oxygen b) smoke c) hydrogen d) smog

Argument	8. The ozone that exists 10-30 miles above the Earth's surface is: a) harmful to us b) protecting us from the sun's harmful ultraviolet rays c) killing farms and crops d) not affecting us at all
Both	9. Air pollution: a) can be blown hundreds of miles and spread out b) does not harm humans c) is not affecting the environment d) is caused only by factories and other plants that give off smoke
Explanation	10. The US government is taking steps to reduce air pollution by: a) making it illegal to drive on certain days b) asking people to recycle c) giving tax breaks to people who walk or ride bikes to work d) setting limits on the amount of chemicals that factories can release into the air
Both	11. Smog can cause each of the following EXCEPT: a) stomach pain b) asthma problems c) irritation of nose, eyes, and throat d) breathing problems
Explanation	12. Air pollution is worse during the: a) spring b) summer c) fall d) winter
Both	13. The blanket of air that surrounds the Earth is called the: a) atmosphere b) climate c) biosphere d) environment
Both	14. Steps to reduce air pollution include all of the following EXCEPT: a) driving less b) put more oxygen in the air c) have factories give off less chemicals into the air d) using public transportation

Explanation	15.	Ozone is worse on hot, sunny days because:
		a) more people are driving
		b) trees cannot remove the carbon dioxide from the air
		c) sunlight helps form ozone
		d) ozone only forms in hot weather

Appendix H
Student Data

Student	Pre-perceived knowledge	Post-perceived knowledge	Pre-demon. knowledge	Post-demon. knowledge	Pre-interest	Post-interest	Pre-belief	Post-belief	Argument	Explanation
02.01.01	35	139	3	10	44	73	134	135	130	122
01.02.01	30	125	6	9	83	97	141	140	117	107
01.03.01	145	146	11	11	128	93	120	112	122	130
02.04.01	72	145	6	7	107	129	140	140	115	107
01.05.01	55	129	10	12	85	98	110	104	103	103
01.06.01	7	87	8	9	43	66	113	116	74	78
01.07.01	74	95	10	10	76	86	131	132	82	95
01.08.01	73	131	8	14	92	115	99	86	128	130
02.09.01	9	103	7	9	50	65	139	136	97	95
02.10.01	20	77	4	5	48	65	89	78	93	78
02.11.01	103	133	8	8	41	64	106	98	125	109
01.12.01	120	141	7	9	84	101	133	133	126	130
01.13.01	83	138	8	9	68	72	135	134	116	120
01.14.01	65	147	10	11	101	128	136	138	110	108
01.15.01	5	141	3	12	90	118	123	120	123	127
01.16.01	120	142	9	14	121	128	139	140	124	133
02.17.01	102	118	11	11	106	105	140	140	122	84
01.18.01	86	111	10	11	68	90	130	130	127	123
01.19.01	16	104	8	10	60	48	91	99	116	132
01.20.01	48	118	6	13	95	105	150	150	126	137
01.21.02	35	135	6	11	27	73	149	149	137	137
01.22.02	56	138	4	11	33	97	137	139	109	150
02.23.02	132	132	5	6	84	103	127	128	119	113
02.24.02	24	90	6	7	89	73	117	122	92	64
01.25.02	142	134	6	13	113	121	123	124	119	118
02.26.02	96	137	8	12	114	126	133	133	122	122

02.27.02	66	69	7	9	98	115	133	133	124	128
02.28.02	69	127	5	12	111	112	96	86	112	108
01.29.02	48	84	7	5	79	98	70	78	97	86
01.30.02	50	112	9	9	121	108	95	103	87	119
02.31.02	74	118	8	8	26	56	122	121	134	76
02.32.02	50	125	3	6	62	61	121	112	138	126
02.33.02	97	132	9	13	86	95	113	118	117	118
02.34.02	105	127	4	6	112	73	89	78	82	72
02.35.01	125	149	9	12	90	117	140	139	141	127
02.36.02	43	100	4	5	86	76	54	51	87	79
01.37.02	62	101	5	11	118	125	108	100	116	119
01.38.01	16	57	6	10	47	66	98	113	87	84
02.39.02	27	131	8	10	84	86	118	107	118	124
02.40.02	*66*	*129*	*6*	*2*	*102*	*110*	*128*	*129*	*101*	*115*
02.41.01	*82*	*132*	*11*	*12*	*53*	*59*	*134*	*134*	*96*	*83*
01.42.01	*84*	*137*	*8*	*8*	*87*	*106*	*132*	*133*	*109*	*113*
01.43.01	*52*	*129*	*7*	*11*	*106*	*138*	*150*	*150*	*121*	*128*
01.44.01	*98*	*144*	*9*	*9*	*115*	*136*	*136*	*134*	*141*	*139*
02.45.01	*83*	*150*	*14*	*13*	*40*	*46*	*150*	*150*	*69*	*75*
01.46.02	*76*	*110*	*6*	*11*	*100*	*122*	*134*	*134*	*125*	*119*
01.47.02	*17*	*69*	*7*	*8*	*96*	*97*	*133*	*133*	*131*	*132*
02.48.01	*26*	*115*	*8*	*12*	*86*	*110*	*142*	*142*	*137*	*141*
02.49.02	*85*	*109*	*7*	*8*	*61*	*79*	*82*	*92*	*87*	*85*
02.50.01	*126*	*114*	*12*	*13*	*83*	*101*	*119*	*109*	*67*	*101*
01.51.01	*107*	*107*	*9*	*10*	*93*	*112*	*140*	*142*	*135*	*119*
02.52.01	*91*	*150*	*12*	*13*	*64*	*80*	*150*	*150*	*117*	*141*
MEAN	**68.04**	**120.44**	**7.44**	**9.77**	**81.85**	**94.67**	**122.02**	**124.37**	**112.37**	**111.38**
Standard Deviation	**34.69**	**22.88**	**2.44**	**2.65**	**26.77**	**24.31**	**22.07**	**21.52**	**19.24**	**21.30**

Note: Student code consists of Gender (1 = female)).Number interviewed. Reading level (1= high, 2=low)
Students who participated in the retrospective verbal report are shaded.
Students who attended the after school program are italicized.

Appendix I
Item-level Summary Tables

Perceived Knowledge Item Mean

Item	Pre-reading	Post-reading
How much do you think you know about air pollution?	63	120

Demonstrated Knowledge Item Mean

Item	Pre-reading	Post-reading
Multiple choice	7	10

Interest Measure Item Means

Item	Pre-reading	Post-Reading
I watch television programs or movies about environmental issues like pollution, global warming, nature, or the environment.	49	66
I would like to learn about ways to reduce pollution or other environmental issues.	96	116
I try to save water by turning off the water while I brush my teeth or limiting how long my shower is.	96	106
I am careful to recycle items such as paper, glass, and plastic at home, school, or elsewhere.	89	99
I read books or articles about environmental issues like pollution, global warming, nature, or the environment.	60	77
I save electricity by turning of lights and other electronics like the television when I leave a room.	99	107

Belief Measure Item Means

	Item	Pre-reading	Post-Reading
Reverse-worded	Air pollution is only caused by factories	93	99
Reverse-worded	Regular people's actions will not solve environmental problems.	96	95
Reverse-worded	Air pollution does not affect people's health.	114	126
	The health of the environment is something that everyone should take steps to help.	125	125
	There are steps each individual can take to stop harming the environment.	118	124
	Air pollution can harm living beings.	124	125

Appendix J
Frequency Table of Demonstrated Knowledge Measure

Pre-reading Frequency	Demonstrated Knowledge Question (correct answer in italics)	Source	Post-Reading Frequency
	1. Air pollution can be caused by:		
32	*a. too much carbon dioxide in the air*		41
0	b. too much oxygen in the air	Both	4
11	c. the use of air conditioners		7
4	d. farming		0
5	No answer/left blank		0
	2. Air pollution can cause all of the following EXCEPT:		
7	a. health problems in humans		2
7	b. forests to decline or die	Both	7
10	c. acid rain to form		4
25	*d. less rain to fall*		39
2	No answer/left blank		0
	3. The rise of temperatures on Earth is known as:		
17	a. climate		12
23	*b. global warming*	Argument	22
1	c. ozone		8
9	d. weather		10
2	No answer/left blank		0
	4. Ozone is formed when:		
15	a. the temperatures are cold		3
2	b. people have fires in their houses	Explanation	4
21	*c. sunlight hits pollutants in the air*		44
4	d. forests are cut down		1
10	No answer/left blank		0
	5. Which place would most likely have the highest level of air pollution?		
31	a. a small town with a factory		17
8	*b. a crowded, busy city surrounded by mountains*	Explanation	20
4	c. a farm that uses pesticides		3
7	d. a crowded, busy city surrounded by flat land		10
1	No answer/left blank		2
	6. All of the following emit pollutants into the air EXCEPT:	Both	
34	*a. littering*		36
3	b. cars		1

3	c. factories		3
12	d. airplanes		12
0	No answer/left blank		0
	7. When airborne chemicals are put into the air and they react with sunlight what substance is formed?		
1	a. oxygen		4
21	b. smoke	Explanation	3
4	c. hydrogen		0
18	*d. smog*		45
8	No answer/left blank		0
	8. The ozone that exists 10-30 miles above the Earth's surface is:		
6	a. harmful to us		12
35	*b. protecting us from the sun's harmful ultraviolet rays*	Argument	34
3	c. killing farms and crops		3
4	d. not affecting us at all		2
4	No answer/left blank		0
	9. Air pollution:		
32	*a. can be blown hundreds of miles and spread out*		37
0	b. does not harm humans	Both	1
4	c. is not affecting the environment		2
15	d. is caused only by factories and other plants that give off smoke		11
1	No answer/left blank		1
	10. The US government is taking steps to reduce air pollution by:		
1	a. making it illegal to drive on certain days		9
23	b. asking people to recycle		17
4	c. giving tax breaks to people who walk or ride buses to work	Explanation	2
22	*d. setting limits on the amount of chemicals that factories can release into the air*		21
2	No answer/left blank		3
	11. Smog can cause each of the following EXCEPT:		
30	*a. stomach pain*		40
5	b. asthma problems	Both	2
8	c. irritation of nose, eyes, and throat		7
1	d. breathing problems		3
8	No answer/left blank		0

	12. Air pollution is worse during the:		
3	a. spring		3
35	*b. summer*	Explanation	40
2	c. fall		1
12	d. winter		7
0	No answer/left blank		0
	13. The blanket of air that surrounds the Earth is called the:		
48	*a. atmosphere*		50
3	b. climate	Both	2
0	c. biosphere		0
0	d. environment		0
1	No answer/left blank		0
	14. Steps to reduce air pollution include all of the following EXCEPT:		
9	a. driving less		7
13	*b. put more oxygen into the air*	Both	24
12	c. have factories give off less chemicals into the air		11
13	d. using public transportation		10
4	No answer/left blank		0
	15. Ozone is worse on hot, sunny days because:		
13	a. more people are driving		14
17	b. trees cannot remove the carbon dioxide from the air	Explanation	10
9	*c. sunlight helps form ozone*		21
5	d. ozone only forms in hot weather		6
9	No answer/left blank		1

Appendix K
Retrospective Verbal Report Transcripts

Interview with CM (an African American male)
He read the argument text first, then the explanation.

JV: Okay, you can look back at the text while we are talking. I want you to, what do you think the author's main point was of this text?

CM: I think the main point of the author was like to warn us what air pollution is doing to our environment and even though we should do, things that we should do, you know like we could do better things in the environment to stop air pollution like…////Let's say for instance a person, left his car on and it is kinda like old and this car starts smoking and all the gas goes into the air and that may cause air pollution.

JV: Good. So do you think that the author's main point, or what some people usually call a claim like why she wrote this, was clear?

CM: Yes, I really think that person was clear because they gave us a huge look on this, they were saying that air pollution can also cause diseases and how like it can be harmful to your body and stuff like that. And like people could go like die or like have the illness for a long time.

JV: Uh huh, good. So um, you already answered that question.

CM: Sorry

JV: No that is good. So what, so you have also mentioned some evidence that the author used to support her claim, so do you think that that evidence, you have already talked about the fact that you can develop diseases, was that convincing, or did that persuade you?

CM: Well, yes it really did because. It really persuaded me to think that you can pour out, like pouring out these like harmful chemicals into streams or something like that. And to try not to harm the environment they really persuaded me to learn more about it.

JV: Good, good. Okay so lets talk specifically about this sub-heading. So this is called a sub-heading right here, so lets talk about this area. So she gave evidence to support her claim under this subheading, and you can certainly re-read it if you need to, but did this particular evidence support or like convince you or support her claim that air pollution is dangerous?

CM: Well, yes it really did, it really did. It really told me about carbon dioxide and it told me about carbon dioxide and I remember this from carbon dioxide in the atmosphere this one [pointing to text] it said that too much carbon dioxide in the atmosphere, too much of it is really bad.

JV: Okay good. So that helped you understand her claim that this is dangerous?

CM: Yeah.

JV: Good okay so let's look at the acid rain sub-heading. So it talks about acid rain and then, I am going to ask you to do the same thing you just did with this one [the co2 section] was this particular piece of evidence convincing to you as a reader?

CM: Well, I would say acid rain is a surprising thing. Yeah I would say as a read, acid rain, I didn't know acid rain could happen on places on Earth and it really surprised me and I found that it really persuaded me that acid rain could also damage like streams, and damage animals and people or the citizens that live near the place, and stuff like that.

JV: Good, good. Now the last two sections she talks about how air pollution affects human's health. Did you think, was that evidence supportive of her claim, that air pollution is dangerous?

CM: Well I like saying "well". It makes me sound tall and all.

JV: [laughing] well that is important.

CM: Yeah, and um human health and air pollution made me understand a whole lot, because it you can start knowing and finding out how you don't want to get a lifetime disease from air pollution it can damage you and make your nose and eyes and yeah.

JV: Okay, so of those three: the carbon dioxide section, which was one piece of evidence, the acid rain sub-section, which was another, and the human health, which do you think of those three you found most convincing?

CM: Hmmm I thought what was really convincing was human health and air pollution.

JV: Okay, why do you think that?

CM: I think it was fairly convincing because it could tell you why you would get these diseases and it would inform you by telling you that these are lifetime diseases which you wouldn't really want to get. So you don't want to pollute the environment.

JV: Okay so which piece of evidence supports her claim the best, that air pollution is dangerous.

CM: Well, let me think about that.

JV: Well, let's think about it. If the claim is that air pollution is a danger which of these three pieces of evidence supported that the most?

CM: Um, can I think about that?

JV: Sure
[Long wait time, 20 seconds]

CM: I think acid rain.

JV: Okay, why did you choose that one?

CM: Because acid rain is something that can harm our environment, and acid rain, well from my point of view I think that acid rain comes from the atmosphere and it can be really dangerous and it can harm, it can harm life as we know it. And it can also kill plants and it can hurt human beings.

JV: Good, so did the information in this text change how you thought or felt about air pollution?

CM: Oh yeah! Because I thought about air pollution that when I wrote it down I was thinking yeah I studied some of air pollution in our science thing. But then when I read all of this it really gave me a new look on how air pollution is and how people pollute the air and how it can be really damaging to us.

EXPLANATION TEXT

JV: Okay, so did any of the examples that the author used help you understand air pollution?

CM: Well, I would say that it did, understand air pollution? Yes

JV: Can you think of any specifics in the text that especially helped you?

CM: Well it told me about smoke and fog and how they smog comes from those words. How smog is dangerous and how it can be caused by lots and lots of stuff and how we should cut down on it. We can take the Metro instead of driving our car much because the back of the car fumes damaging fumes come out of the car and go into the air including what um and some fumes from factories also come are coming and and that is creating air pollution.

JV: Good, so did any of the examples that she used feel very real or help you as a reader feel like you were there when they were talking about it?

CM: Yes, it really felt like I could be there because it also said. You know some of these days when my mom is driving and I am in her car and we're going some places I know that I see cars and they are cars that are running and I see fumes coming out of them and at the same time I can see buildings that have smoke coming out of them, like factories and stuff like that.

JV: Okay good. So the author, in the very first paragraph the author talks about how smog affects various people. So in LA children have to play inside, little league games are canceled. Do you think that was a good example?

CM: Yes, it was a really good example because the parents of those children might have to keep their children in because they don't want anything like smog hurting the children and like affecting them.

JV: so what about under smoke and sunlight? This is where they talk about…imagine you're riding in a car…what did you think of that example, was that a good example to help a reader understand air pollution?

CM: Well, yes it does help a reader and at the same time it tells the reader how you can prevent air pollution too.

JV: Okay good. Now on the 3rd page, it talks about how cities with bad smog are often in valleys and how it is often like a bowl, did that example help you understand?

CM: Not really, I don't think really it did help me understand because. Well it just didn't.

JV: Okay, so do you think that the information in this text changed how you though about air pollution?

CM: Yes, because before, well yes a lot it did. Before I would be thinking that air pollution yeah it is all the way up in the sky and it doesn't damage us and we have our lives to live and all that. But now that I have read this air pollution has really taught me that we just don't have our lives to just, that we have to always be careful of what we're putting into the atmosphere.

Interview with LA
(Caucasian female)

JV: So did any of the examples that the author used in the text help you understand while you were reading?

LA: Yes

JV: Can you think of any specific ones?

L: Um like they told us…like what they would do was like "What is smog?" and then told what causes it and that kind of helped you understand so it made more sense.

J: So the use of a question…

L: Yeah

J: So that helped you know what you were reading about.

L: Yes

J: Good. Were there any parts of the text that seemed real to you or that you could kind of fully understand?

L: Um well all of the same kind of real possible, like it could really happen kind of stuff.

J: So it was realistic, but were there any parts as you were reading where you actually felt like you were there or…

L: Well I kind of can understand like this could really happen.

J: Okay, in this opening section, the author included a lot of examples, like in LA children can't go outside to play. And in Mexico City people can only drive on certain days…Did those help you, were those good examples that helped you understand while you read?

L: Well it kinda says like if air pollution, if we keep polluting the air then this can really happen to the whole world.

J: Okay. Then moving along to where it says "Smoke and Sun". It opens with…Imagine you are riding in your car and there are fumes and you roll down your window and your body reacts… Do you think that is a good example that helped you as a reader?

L: Yeah, I guess so.
J: Okay. What were you thinking about or feeling when you read that section?

L: Well, it can burn your eyes, kind of like a fire or something, but something like that can really happen.

J: Have you ever had something like that happen where you went outside and where like, whoa!?

L: Well actually when we go camping we light the fire and all this smoke comes out and it can hurt.

J: So that was really something you have experienced before?

L: Yeah.

J: Good. So then on the last page, the last subheading, it is the same thing like you mentioned with the question, "What causes smog and what can we do?" And, where it says cities that are surrounded by mountains are like a bowl and the mountains trap the air pollution above the city. Did that example help you understand that idea?

L: Well I kinda can see like a town being in that kind of area. So it can, I can understand how it is like a bowl and the pollution doesn't come out.

J: Okay, so it was helpful for the author to explain that it was like a bowl and it trapped.

L: Like it made sense to me a little more.

J: Okay good. So did this information in the text change how you thought about air pollution at all?

L: Um a little bit. I mean I always knew that it was of like real bad. But I didn't know that stuff like this could happen and like that it is a big, big concern.

J: Okay, I am going to give you the other text…

ARGUMENT

J: What was the author's main point?

L: Um, the dangers of air pollution?

J: Okay. Good. Do you think it was clear where the author stood on the issue? Well actually, where do you think she stood? What was her opinion about the dangers of air pollution?

L: Um that it can cause a lot of damage to humans and animals.

J: Okay so it is a pretty serious threat is what she was saying?

L: Yes.

J: Okay and that was pretty clear in the text?

L: Nods yes

J: Okay, sometimes the stance that an author takes is called a claim. So her claim is that air pollution is really dangerous. Do you think she used a lot of evidence to support her claim?

L: Um, I think so, enough to understand.

J: Okay, what do you think of the quality of the…can you think of any evidence in particular that stands out that you thought was very supportive of her claim?

L: Um, not really.

J: Okay, under this subheading, "Carbon dioxide and the atmosphere" the author gave a lot of information about how carbon dioxide harms the atmosphere and therefore contributes to pollution of the air. What did you think of the quality of that support? Did that help support her claim?

L: I think so.

J: What about acid rain? Under that subheading she talked about how it formed, and what it means…did you find that evidence convincing?

L: Yes.

J: Okay. What about the section that talks about the effects of air pollution on human health? Did you find that to be good evidence to support the claim?

L: Yes.

J: Which of those three, the carbon dioxide, acid rain, or the human health, did you think was the most convincing piece of evidence, if you had to pick one of them?

L: The human health

J: Why?

L: Because I have a couple of friends, and even family with problems like breathing and asthma and stuff.

J: So you were able to relate to it since you know people with those conditions?

L: Yeah.

J: Good. So did this text change how you thought about air pollution at all?

L: A little, I mean I know most of it, like Air pollution can cause asthma and acid rain and stuff, but it changed a little.

J: Okay so a lot of the information you read in the text you felt like you already knew?

L: Yeah.

Interview with HH
(Ethiopian Female)

J: What was the author's main point in this text?

H: To teach the reader about air pollution and it's effects.

J: So, that is the author's claim, right?

H: Yes.

J: Was the author's claim clear?

H: Very clear. After I read it I understood more about air pollution than I already did.

J: Good. So did they support their claim well? Let me step back for a minute. The text was written to argue a point. What was the author's point?

H: The author's point was that we should try to protect the ozone layer and try to stop air pollution because it can kill people and animals and plants.

J: Okay, so did the author support their claim well?

H: Yes. I think she did.

J: Okay, so what evidence in this text did you find or support did you find was really helpful as you read?

H: Well I think that um, the part about acid rain was helpful because that told me about what causes acid rain and how it starts and things like that.

J: Good. All right, so we talked about acid rain, but let's return to the first section which talked about how carbon dioxide and then air pollution was formed. Did you think that evidence was helpful in supporting her claim?

H: Uh, yeah I think it was very supportful because that also plays a part in air pollution.

J: Good, what about the last piece of evidence which was about human's health and how air pollution affects human's health? Did you think that was a good piece of evidence?

H: Yeah I think it was good because now I know how to protect myself from it and things like that.

J: So of those three, the carbon dioxide, the acid rain-which you already mentioned-and the human health, which of those three did you find to be the most convincing or supportive of the claim that air pollution is a real threat to us?

H: Um, I think human health.

J: Why?

H: Because it has more to do with us and everything else. I mean people might get it more if they see that it might happen to them and they might not really care if it happens to the elderly and in other places or animals. It convinces them more if it happens to them.

J: Did this text change how you thought about air pollution at all?

H: Um, yeah it did. I learned more than I usually did, I didn't think it [AP] was really that big of a deal though.

J: Okay, so before you read you didn't think it was that big of a deal…

H: Well I knew it was important, but not this important, like it could damage our health.

J: Good.

EXPLANATION

J: In the section entitled 'What is smog?' are there any examples that the author used that you thought were particularly helpful in helping you understand the text?

H: Yes I did. One example was how kids in LA could not play outside all the time because the smog was so thick. That kind of helped me understand that it is that dangerous and it can really damage your lungs or your eyes.

J: Good. Any others you can think of?

H: Um, well also riding in the car and it was kind of hot and all the cars were letting out exhaust. You just open the window and you can't breathe. Then you can't do anything about it because your eyes are burning and then you have to turn on your air conditioning which also increases the air pollution.

J: So that example that you just talked about, how did that help you as a reader?

H: Well it helped me understand that we should try to walk for short distances and not use a car everywhere we go because that will really increase it.

J: Were there any examples in here that helped you physically feel what was going on? Or pictures, where you thought, oh I have had that happen to me before.

H: Yeah actually once we went to LA and every single time we tried to go somewhere to travel our aunt she made us wear sunscreen and a visor and we couldn't stay out too long or …and we mostly traveled around after dark.

J: Good, so you have first hand experience with that. What I want to ask you, when you were talking about how it affected you as you drove around in a car and how you roll down your window…have you ever had that happen where there has been so much pollution in the air and you didn't realize so you rolled down the window and your eyes were watering?

H: Um actually we travel a lot when we go to NJ because we drive. There was this one time I think I was about seven we tried, there was a big traffic jam and it took about 8 hours to get there. We tried opening the windows because it was midday and really hot. But my littlest sister started coughing really bad and my sister with the glasses her eyes just started getting red. So my mom had to close the windows and turn on the air conditioning.

J: Wow so you really have had this happen. This example here talks about how cities that are surrounded by mountains it acts like a bowl where pollution gets trapped in the bowl and can't really get out. Did the description of that, like a bowl, did that help you picture in your mind how air pollution might get trapped in cities surrounded by mountains as opposed to flat cities?

H: Yeah, it did because in a flat city it can rise up easier, but in a mountain it kind of stays there because it can't reach up to the sky.

J: So did the description of a bowl actually help you envision that?

H: Yes it did.

J: Good. Did this text change how you felt about air pollution?

H: It did because it talked more about smog and I didn't really know what that was I didn't know what it was after reading this one more than the other text.

J: Do you think this text or the other text helped relate to you as a reader and what you have experienced?

H: I think this text helped me cooperate with my first-hand experience. With the other text, no one in my family has asthma or lung diseases and things like that so

J: It didn't really connect?

H: Yeah, it didn't really connect with this one [pointing to argument] it connected more with this one [explanation].

Retrospective Verbal Report
SA (African American Male)

J-   Did any of the examples in the text, that the author used, help you understand air pollution?

S-   Yes

J-   Which ones?

S-   I think it was, what I remember is Smoke and Smog, Smoke and Sunlight, and What Causes it and what can we do.

J-   Good, so lets go back so the Smoke and Smog, the first one. How did that help you out as you read?

S-   Um, because it taught me about smog or something like smoke and fog and that it can be harmful to your eyes. They give an example, there is traffic and a really hot day and you want to roll down your window to get some air in there and there is this big cloud of smoke and smog on top of this factory and then when you wind down the window it kind of burns your eyes. That is what it taught me about smoke and fog.

J-   Good. So how did that help you, you mentioned the example of how you roll down your window…how did that help you?

S-   It helped me so that, it helped me understand that smog is harmful.

J-   Good. So did you feel like you were there? Could you feel like, oh I know what they mean, my eyes have burned before?

S-   Uh huh

J-   Good. Then you talked about smoke and sunlight. What did that help you with?

S-   Well, it taught me about the smoke that comes out of your car and makes the air pollution. And that is what I learned about it. Because people they trying to make people to stop driving their cars too much so they won't get that much smoke and cause air pollution.

J-   Very good. Now, then the last one…What causes smog and what can we do? What did that help you out with?

S-   Well what causes smog is that sun causes chemicals in the smoke to break apart and come back together as ozone or smog. And what I can do to prevent this from happening is that I can encourage my family or friends or neighbors to stop driving as much. And I can take a bicycle or walk to some places.

J-   Good. Now I have two examples that I would like to see if they helped you understand. The first one is that they talked about like in LA, kids have to play inside or little league games are cancelled, or high school football games have to play in the gym. And in Mexico people can only drive on certain days. Does that help you understand?

S-   Like, what is happening in different cities and smog and why it is causing so much damage and that is why they are making all these rules in the cities.

J-   Okay, so smog is causing all these people to change the way they live?
S-   Uh huh.

J-   Good. This example right here, which says that cities with bad smog sit in valleys surrounded by mountains, kind of like a bowl. So that is called a metaphor, the author is comparing these mountains to a bowl. Does that help you understand?

S-   Yes. Because it is like this air around this mountain and it is kind of like a bowl so that is what the metaphor was trying to say to me.

J-   Okay, so the bad air can't leave very easily?

S-   [nods yes]

J-   Did this information in the text change how you felt about air pollution?

S-   Yes. It made me start thinking about ways I can prevent smoke or smog from coming into the air. And like stop or try to encourage, like I said before, people to stop driving too much.

ARGUMENT TEXT

J-   What was the author's claim in this text?

S-   Air pollution is an important issue that threatens all living things on the Earth.

J-   Good. So can you put that into your own words?

S-   That air pollution is important and it can damage human beings and animals on the earth.

J-   Good. Is that clear in the text?

S-   Yes.

J-   Good. Do you think she supported her claim well?

S-   Yes.

J-   Why do you think she supported her claim well? Why would you say that?

S-   She talked about why pollution and pollution in the land. And then its dangers and that air pollution releases harmful chemicals into the air and human beings and living things we breathe them so we can get affected by them. And she said that for these reasons air pollution is a threat to all living things on Earth and it must be stopped

J-   Good, so she kind of restates her claim at the end. Um underneath the subheading Carbon Dioxide and the Atmosphere, she explains how air pollution is caused and how carbon dioxide in the air causes a lot of our problems. What do you think of this evidence?

S-   Yes, it was good. She talked about carbon dioxide and how it is dangerous and how it can affect the atmosphere. Like the ozone layer which protects us from harmful ultraviolet rays which can damage our eyes.

J-   Good. Well under this subheading it talks about acid rain and how air pollution contributes to the formation of acid rain. How did this evidence do in supporting the claim that air pollution is bad?

S-   Well it talks about acid rain which is a part of air pollution. It kills crops, plants, and trees, and forests and pollutes the soil. If it gets in the rivers or streams it can affect fish and other animals that live in the water.

J-   Okay so you just told me how acid rain forms and all the things acid rain can do. So if our claim is that air pollution is dangerous, does this support it.

S-   Yeah.

J-   Good. Finally, these two subheadings, Human Health and Who Gets Sick, talk about how air pollution affects us as humans and what it can possibly do to us. Did you find that to be convincing evidence?

S-   Yes, because it causes like asthma, lung disease, I don't know what that word means.

J-   Bronchitis.

S-   Yeah, bronchitis, and pneumonia.

J-   Good, so of those three pieces of evidence, human health, acid rain, and carbon dioxide. Which did you find the most convincing?

S-   Human health and air pollution. Because it talked about how we can get sick and then it said illness that acid rain and carbon dioxide can help cause.

J-   Good, so did this text change how you thought or felt about air pollution?

S-   Yes.

References

Afflerbach, P.P. (1990). The influence of prior knowledge on expert readers' main idea construction strategies. *Reading Research Quarterly*, 25, 31-46.

Afflerbach, P. (2000). Verbal reports and protocol analysis. In M. Kamil, P. Mosenthal, P. Pearson, & R.Barr (Eds.) *Handbook of Reading Research, Vol. 3,* 163-179). Mawah, NJ: Erlbaum Associates.

Alexander, P.A. (2005/6) The path to competence: A lifespan develomental perspective in reading. *Journal of Literacy Research,* 37(4), 413-436.

Alexander, P.A., Buehl, M.M., & Sperl, C.T. (2001). The persuasiveness of persuasive discourse. *International Journal of Educational Research*, 35 (7-8), 651-674.

Alexander, P.A. & Docy, F.J.R.C. (1994). Adults' views about knowing and believing. In R.Garner & P.A. Alexander (Eds.) *Beliefs about text and instruction with text*. (pp. 223-244.) Hillsdale, NJ: Lawrence Erlbaum Associates.

Alexander, P.A. & Jetton, T.L. (1996). The role of importance and interest in the processing of text. *Educational Psychology Review*, 8, 89-121.

Alexander, P.A. & Jetton, T.L. (2000). Learning from text: A multidimensional and developmental perspective. . In M. Kamil, P. Mosenthal, P. Pearson, & R.Barr (Eds.) *Handbook of Reading Research, Vol. III,* 285-310). Mawah, NJ: Erlbaum Associates.

Alexander, P.A., Jetton, T.L. & Kulikowich, J.M. (1995). Interrelationship of knowledge, interest, and recall: Assessing a model of domain learning. *Journal of Educational Psychology*, 87(4).

Alexander, P.A., Kulikowich, J.M., & Jetton, T.L. (1994). The role of subject-matter knowledge and interest in the processing of linear and nonlinear texts. *Review of Educational Research*, 64, 315-343.

Alexander, P.A., Murphy, P.K. Buehl, M.M., & Sperl, C.T. (1998) The influence of prior knowledge, beliefs, and interest on learning from persuasive text. *National Reading Conference*, 47, 167-181.

Alexander, P.A., Schallert, D.L. & Hare, V.C. (1991). Coming to terms: How researchers in learning and literacy talk about knowledge. *Review of Educational Research*, 61(3), 315-343.

Allen, M. (1991). Meta-analysis comparing the persuasiveness of one-sided and two-sided messages. *Western Journal of Speech Communication*, 55, 390-404.

Allport, G.W. (1935). Attitudes. In C. Murchison (Ed.) *A handbook of social psychology* (798-844). Worcester, MA: Clark University Press.

Alvermann, D.E. & Hynd, C.R. (1989). Effects of prior knowledge activation modes and text structure on nonscience majors' comprehension of physics. *Journal of Educational Research*, 83(2), 97-102.

Anderson, R.C., Chinn, C., Chang, J., Waggoner, M., & Yi, H. (1997). On the logical integrity of children's arguments. *Cognition and Instruction*, 15(2), 135-167.

Anderson, R.C. & Pearson, P.D. (1984). A schema-theoretic view of basic processes in reading. In P.D. Pearson (Ed.), *Handbook of reading research* (pp. 255-292). White Plains, NY: Longman.

Armbruster, B.B., Anderson, T.H., & Ostertag, J. (1987). Does text structure/summarization instruction facilitate learning from expository text? *Reading Research Quarterly*, 22(3), 331-346.

Ball, A.F. (1992). Cultural preference and the expository writing of African-American adolescents. *Written Communication,* 9(4), 501-532.

Beck, I.L., & McKeown, M. (1991). Conditions of vocabulary acquistion. In R. Barr, M.L. Kamil, P.B. Mosenthal, & P.D. Pearson (Eds.), *Handbook of reading research: Vol. II* (pp. 789-814). White Plains, NY:Longmann.

Beck, I.L., McKeown, M.G., & Gromoll, E.W. (1989). Learning from social studies texts. *Cognition and Instruction,* 6, 99-158.

Buehl, M.M. Alexander, P.A., Murphy, P.K. & Sperl, C.T. (2001). Profiling persuasion: The role of beliefs, knowledge, and interest in the processing of persuasive texts that vary by argument structure. *Journal of Literacy Resesarch*, 33(2), 269-301.

Cain, K., Oakhill, J., & Bryant, P. (2004). Children's reading comprehension ability: Concurrent prediction by working memory, verbal ability, and component skills. *Journal of Educational Psychology*, 96(1), 31-42.

Cain, K., Oakhill, J., & Lemmon, K. (2004). Individual differences in the inference of word meanings from context: The influence of reading comprehension, vocabulary knowledge, and memory capacity. *Journal of Educational Psychology*, 96(4), 671-681.

Chall, J.S. (1983). *Stages of reading development.* New York: McGraw-Hill Book Company.

Chambliss, M.J. (1994). Why do readers fail to change their beliefs after reading persuasive text? In R.Garner & P.A. Alexander (Eds.) *Beliefs about text and instruction with text*. (pp. 75-89.) Hillsdale, NJ: Lawrence Erlbaum Associates.

Chambliss, M.J. (1995). Text cues and strategies successful readers use to construct the gist of lengthy written arguments. *Reading Research Quarterly*, 30(4), 778-807.

Chambliss, M.J. (2001) Analyzing science textbook materials to determine how "persuasive" they are. *Theory into Practice*, 40(4), 255-264.

Chambliss, M.J. & Calfee, R.C. (1998). *Textbooks for learning: Nurturing children's minds*. Oxford, UK: Blackwell.

Chambliss, M.J., Christenson, L.A., & Parker, C. (2003). Fourth graders composing scientific explanations about the effects of pollutants: Writing to understand. *Written Communication,* 20(4), 426-454.

Chambliss, M.J. & Garner, R. (1996). Do adults change their minds after reading persuasive text? *Written Communication*, 13(3), 291-313.

Chambliss, M.J. & Murphy, P.K. (2002). Fourth and fifth graders representing the argument structure in written texts. *Discourse Processes,* 34(1), 91-115.

Commeyras, M. (1993). Promoting critical thinking through dialogical-thinking reading lessons. *The Reading Teacher,* 46(6), 486-493.

Cooper, L. (1932) *The rhetoric of Aristotle*. Appleton-Century-Croft: New York.

de Castell, S. & Luke, A. (1986). Models of literacy in North American schools. In S. de Castell, A. Luke, & K. Egan (Eds.), *Literacy, society, and schooling: A reader* (pp. 87-109). New York: Cambridge University Press.

Dole, J.A. (2000). Readers, texts, and conceptual change learning. *Reading Research Quarterly*, 16, 99-118.

Dole, J.A. & Sinatra, G.M. (1994). Social psychology research on beliefs and attitudes: Implication for research on learning from text. In R.Garner & P.A. Alexander (Eds.) *Beliefs about text and instruction with text*. (pp. 245-264.) Hillsdale, NJ: Lawrence Erlbaum Associates.

Dole, J.A. & Sinatra, G.M. (1998). Reconceptualizing change in the cognitive construction of knowledge. *Educational Psychologis*t, 33(2/3), 109-128.

Dole, J.A., Valencia, S.W., Greer, E.A., & Wadrop, J.L. (1991). Effects of pre-reading instruction on the comprehension of narrative and expository text. *Reading Research Quarterly*, 26, 142-159.

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

Donovan, C.A. & Smolkin, L.B. (2002). Children's genre knowledge: An examination of K-5 students' performance on multiple tasks providing differing levels of scaffolding. *Reading Research Quarterly*, 37 (4), 428-465.

Duke, N.K. (2000). 3.6 Minutes per day: The scarcity of informational texts in first grade. *Reading Research Quarterly*, 35 (2), 202-224.

Duke, N.K. & Kays, J. (1998). "Can I say 'Once upon a time'?": Kindergarten children developing knowledge of information book language. *Early Childhood Research Quarterly,* 13(2), 295-318.

Eagley, A.H. & Chaiken, S. (1993). *The psychology of attitudes*. Ft. Worth, TX:Harcourt, Brace, & Jovanovich.

Englert, C.S. & Hiebert, E.H. (1984). Children's developing awareness of text structures in expository materials. *Journal of Educational Psychology*, 76(1), 65-74.

Englert, C.S., Hiebert, E.H., Stewart, S.R. (1988). Detecting and correcting inconsistencies in the monitoring of expository prose. *Journal of Educational Research,* 81(4), 221-227

Feldt, R.C., Feldt, R.A., & Kilburg, K. (2002). Acquisition, maintenance, and transfer of a questioning strategy in second- and third-grade students to learn from science text books. *Reading Psychology*, 23, 181-198.

Golder, C. & Coirier, P. (1994). Argumentative text writing: Developmental trends. *Discourse Processes,* 18, 187-210.

Guzzetti, B.J. (2000). Learning counter-intuitive science concepts: What have we learned from over a decade of research? *Reading and Writing Quarterly*, 16, 89-98.

Guzzetti, B.J., Snyder, T.E., Glass, G.V., & Gamas, W.S. (1993). Promoting conceptual change in science: A comparative meta-analysis of instructional interventions from reading education and science education. *Reading Research Quarterly*, 28(2), 116-159.

Guzzetti, B.J., Williams, W.O., Skeels, S. A., & Wu, S.M. (1997). Influence of text structure on learning counterintuitive physics concepts. *Journal of Research on Science Teaching*, 34(7), 701-719.

Hall, K.M., Sabey, B.L., & McClellan, M. (2005). Expository text comprehension: Helping primary-grade teachers use expository text to full advantage. *Reading Psychology*, 26, 211-234.

Hare, V.C., Rabinowitz, M., & Schieble, K.M. (1989). Text effects on main idea comprehension. *Reading Research Quarterly*, 24(1), 72-88.

Hidi, S. (1990). Interest and its contribution as a mental resource for learning. *Review of Educational Research*, 60(4), 549-571.

Hill, T. & Lewicki, P. (2006). *Statistics Methods and Applications*. StatSoft: Tulsa, OK.

Hovland, C.I., Janis, I.L., & Kelley, H.H. (1953). *Communication and persuasion*. London: Yale University Press.

Hynd, C., Alvermann, D.E., & Qian, G. (1997). Preservice elementary school teachers' conceptual change about projectile motion: Refutation text, demonstration, affective factors, and relevance. *Science Education*, 81, 1-27.

Hynd, C.R., McWhorter, Y., Phares, V., & Suttles, W. (1994). The role of instructional variables in conceptual change in high school physics topics. *Journal of Research in Science Teaching*, 31, 933-946.

Jenkins, J.R., Fuchs, L.S., van den Broek, P., Espin, C., Deno, S.L. (2003). Sources of individual differences in reading comprehension and reading fluency. *Journal of Educational Psychology*, 95(4), 719-729.

Johnson, B.T., Lin, H.T., Symons, C.S., Campbell, L.A., & Ekstein, G. (1995). Initial beliefs and attitudinal latitudes as factors in persuasion. *Personality and Social Psychology Bulletin*, 21(5), 502-511.

Juel, C. (1988). Learning to reading and write: A longitudinal study of 54 children from first through fourth grades. *Journal of Educational Psychology,* 80 (4), pp. 437-447.

Kamberelis, G. (1999). Genre development and learning: Children writing stories, science reports, and poems. *Research in the Teaching of English*, 33, 403-460.

Kardash, C.M. & Scholes, R.J. (1996). Effects of preexisting beliefs, epistemological beliefs, and need for cognition on interpretation of controversial issues. *Journal of Educational Psychology*, 88(2).

Kinneavy, J.L. (1971). *A theory of discourse.* New York: W.W. Norton.

Langer, J.A. (1985). Children's sense of genre. *Written Communication*, 2(2), 157-187.

Leu, D.J. (2000). Literacy and technology: Deictic consequences for literacy education in an information age. In R. Barr, M.L. Kamil, P. Mosenthal, & P.P. Pearson (Eds.), *Handbook of reading research Vol. III.* White Plains, NY: Longman.

Lomax, R.G., (2000). *Statistical concepts* (2nd. Ed.). New Jersey: LEA.

McKeown, M.G. & Beck, I.L. (1990). The assessment and characterization of young learners' knoweldge of a topic in history. *American Educational Research Journal, 27, 688-726.*

McKeown, M.G., Beck, I.L., Sinatra, G.M., & Loxterman, J.A. (1992). The contribution of prior knowledge and coherent text to comprehension. *Reading Research Quarterly*, 27, 79-93.

Meyer, B.J.F. (1985). Prose analysis: Purposes, procedures, and problems. In B.K. Britton & J.B. Black (Ed.) *Understanding expository text.* (pp. 11-64). Hillsdale, NJ: Erlbaum.

Miller, G.R. (1980). On being persuaded: Some basic distinctions. In M.E. Roloff & G.R. Miller (Eds.) *Persuasion: New directions in theory and research.* (p. 11-28). Sage Publications: Beverly Hills, CA.

Murphy, P.K. (1998). Toward a multifacted model of persuasion: Exploring textual and learner interactions. Unpublished doctoral dissertation, University of Maryland, College Park, MD.

Murphy, P.K. (2001). What makes a text persuasive? Comparing students' and experts' conceptions of persuasiveness. *International Journal of Educational Research*, 35(7-8), 675-698.

Murphy, P.K. & Alexander, P.A. (2002). What counts? The predictive powers of subject-matter knowledge, strategic processing, and interest in domain-specific performance. *The Journal of Experimental Education*, 70(3), 197-214.

Murphy, P.K. & Mason, L. (2006). Changing knowledge and beliefs. In P.A. Alexander and P.H. Winne (Eds.) *Handbook of Educational Psychology* (2nd. Ed.). Mahwah, NJ: Lawrence Erlbaum.

National Reading Panel. (2000). *Report of the National Reading Panel: Teaching children to read- an evidence-based assessment of the scientific research literature on reading and its implications for reading instruction* (NIH Publication No. 00-4769). Jessup, MD: National Institute for Literacy.

Nickerson, R.S. (1991). Modes and models of informal reasoning: A commentary. In J.F. Voss, D.N. Perkins, & J.W. Segal (Eds.), *Informal reasoning and education* (291-309). Hillsdale, NJ: Lawrence Erlbaum Associates.

Nystrand, M. (1986). *The structure of written composition: Studies in reciprocity between writers and readers*. London: Academic Press.

Palinscar, A.S., & Brown, A.L. (1984). Reciprocal teaching of comprehension-fostering and comprehension-monitoring activities. *Cognition and Instruction,* 1 (2), 117-175.

Pedhazur, J. (1997). *Multiple regression in behavioral research (3rd. Ed.)*. New York: Harcourt Brace.

Perfetti, C.A. (1992). The representation problem in reading acquisition. In P. Gough, L Ehri, & R. Trieman (Eds.), *Reading acquisition* (pp. 145-174). Mahwah, NJ: Erlbaum.

Petty, R.E. & Cacioppo, J.T. (1986). *Communication and persuasion: Central and peripheral routes to attitude change*. Springer-Verlag: New York.

Pressley, M. (2000). What should comprehension instruction be the instruction of? In M. Kamil, P. Mosenthal, R. Barr, & P.D. Pearson (Eds.), *Handbook of Reading Research* (Vol. III, pp. 545-561). Mahwah, N.J. : L. Erlbaum Associates.

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

RAND Reading Study Group (2002). *Reading for understanding: Toward an R & D program in reading comprehension*. Santa Monica, CA: RAND Corporation.

Ray, K.W. (1999). *Wondrous words*. Portsmouth, NH: Heinemann.

Resnick, D.P. & Resnick, L.B. (1977). The nature of literacy: An historical explanation. *Harvard Educational Review*, 47 (3), 370-385.

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

Rosenblatt, L. (2005). *Making meaning with texts*. Portsmouth, NH: Heinemann.

Rowan, K.E. (1988). A contemporary theory of explanatory writing. *Written Communication*, 5(1), 23-56.

Rowan, K.E. (1990). Cognitive correlates of explanatory writing skill. *Written Communication*, 7(3), 316-341.

Showers, D.E. & Shrigley, R.L. (1995). Effects of knowledge and persuasion on high-school students' attitudes toward nuclear power plants. *Journal of Research in Science Teaching*, 32(1), 29-43.

Smith, F. (1983). Reading like a writer. *Language Arts*, 60(5), 558-567.

Smolkin, L.B., & Donovan, C.A. (2001). The contexts of comprehension: The information book read aloud, comprehension acquisition, and comprehension in a first grade classroom. *The Elementary School Journal*, 102(2), 97-122.

Smolkin, L.B., & Donovan, C.A. (2003). Supporting comprehension acquisition for emerging and struggling readers: The interactive information book read aloud. *Exceptionality*, 11(1), 25-38.

Snow, C.E., Burns, M.S., & Griffin, P. (Eds.) (1998). *Preventing reading difficulties in young children*. Washington, DC: National Academy Press.

Stanovich, K.E. (1980). Toward an interactive-compensatory model of individual differences in the development of read fluency. *Reading Research Quarterly*, 16, 32-71.

Stein, N.L., & Miller, C.A. (1991). I win- you lose: The development of argumentative thinking. In J. Voss, D. Perkins, & J. Segal (Eds*.), Informal reasoning and instruction* (pp. 265-290). Hillsdale, NJ: Lawrence Erlbaum Associates.

Stiff, J.B. & Mongeau, P.A. (2003). *Persuasive communication (2nd. ed.)*. New York: Guildford Press.

Swales, J.M. (1990) *Genre analysis: English in academic and research settings.* Cambridge: Cambridge University Press.

Taboada, A. & Guthrie, J.T. (2004). Growth of cognitive strategies for reading comprehension. In J.T. Guthrie, A. Wigfield, & K.C. Perencevich (Eds.) *Motivating reading comprehension: Concept-oriented reading instruction* (pp. 273-306). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Taboada, A. & Guthrie, J.T. (2006), Contributions of student questioning and prior knowledge to construction of knowledge from reading information text. *Journal of Literacy Research*, 38(1), 1-36.

Tan, A. & Nicholson, T. (1997). Flashcards revisited: Training poor readers to read words faster improves their comprehension of text. *Journal of Educational Psychology*, 89, 2, 276-288.

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

van Dijk, T.A. & Kintsch, W. (1983). *Strategies of discourse comprehension*. New York, NY: Academic Press.

Weiss, D.M. & Sachs, J. (1991). Persuasive strategies used by preschool children. *Discourse Processes,* 14, 55-72.

Weems, G. H., & Onwuegbuzie, A. J. (2001). The impact of midpoint responses and reverse coding on survey data. *Measurement and Evaluation in Counseling and Development, 34*, 166-176.

Williams, J.P., Hall, K.M., & Lauer, K.D. (2004). Teaching expository text structure to young at-risk learners: Building the basics of comprehension instruction. *Exceptionality*, 12(3), 129-144.

Williams, J.P., Hall, K.M., Lauer, K.D., Stafford, K.B., & DeSisto, L.A. (2005). Expository text comprehension in the primary grade classroom. *Journal of Educational Psychology, 97*(4), 538-550.

Williams, S. A., & Swanson, M. S. (2001). The effect of reading ability and response formats on patients' abilities to respond to a patient satisfaction scale. *The Journal of Continuing Education in Nursing, 32*(2), 60-67.