

ABSTRACT

Title of Dissertation: MIDDLE-SCHOOL STUDENTS COMPREHENDING,
ANALYZING, AND EVALUATING PERSUASIVE TEXT

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Students are inundated with posters, fliers, commercials, and advertisements intended to persuade. Students also are challenged to think critically about persuasion on high-stakes assessments, but their textbooks rarely include argument. Students have little experience with written persuasion and may lack the knowledge and skills necessary to comprehend and evaluate it. Research with adults has shown that prior knowledge and text characteristics affect reader persuasion. However, it is risky to design instruction for middle-school students based on adult outcomes. Thus, this study extended research on adults to middle-school students.

A total of 357 middle-school students between 11 and 15 years old in grades six through eight read an argument on keeping animals in zoos structured as one-sided, two-sided refutation, or two-sided nonrefutation. Text content was emotional and factual. Students rated the persuasiveness of content during reading, rated their knowledge and beliefs before and after reading, and answered comprehension and evaluation questions.

Verbal reports collected from 26 students informed how students processed persuasive text.

Overall, most middle-school students' lacked adult knowledge of argument and persuasion for reasoning through the argument and its content. Most students identified persuasive text as written to inform, and selected the topic as the main point and a claim as the supporting detail. Students identified the argument in two-sided refutation more accurately. Verbal responses revealed that few students used knowledge of argument structure or persuasive content to comprehend, analyze, and evaluate. Instead, most students reacted to the content as they read and later inaccurately induced the author's purpose and argument.

When evaluating premises, a majority of students selected the evidence as their source, but verbal responses indicated that students reasoned from text-based evidence, prior knowledge and their beliefs, despite selecting the evidence basis. Their particular basis depended upon the premise statement being evaluated.

Students lacked knowledge of argument and persuasive content and were highly persuaded by both the emotional content and argument structure. Students rated emotional content as more persuasive than factual content. Other results suggested that one-sided argument affected students' beliefs the most. Changes in perceived knowledge mirrored changes in beliefs.

MIDDLE-SCHOOL STUDENTS COMPREHENDING, ANALYZING,
AND EVALUATING PERSUASIVE TEXTS

by

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Dedication

To my daughters, Katherine and Elizabeth

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I would like to acknowledge all of the special people who helped make this dissertation study possible: my daughters, Elizabeth and Katherine, for their patience and assistance throughout my graduate studies; my dissertation committee for guiding my research and sharing their expertise with me; my advisor, Dr. Marilyn Chambliss, for sharing her expertise and her experiences with me, for her words of encouragement and for her ongoing support of my work and my abilities; my friends, Bob and Kim Hale, Joe Dressel, and Lisa Meyer for their faith in me and for their care; my mother, Amelia Franek for her prayers and concern; my sister and brother, Lynne and Xavier Costet for their support and encouragement; my colleagues, Cindi Becker, Janice O'Hara, and Colleen Hardman for their friendship and timely encouragement; my school district administrators, teachers, parents and students for consenting to this much needed research; and my teacher mentor, Dr. Tom Sherwood, for encouraging me to pursue doctoral studies at the University of Maryland, College Park. You have all played an important role in my life and doctoral studies.

Table of Contents

Dedication	ii
Acknowledgments	iii
Table of Contents	iv
List of Tables	vii
List of Figures	ix
Chapter 1: Introduction	1
<i>Rationale</i>	5
<i>Readers Comprehending and Analyzing Argument</i>	6
<i>Development in Argument Comprehension</i>	7
<i>Development in Argument Analysis and Evaluation</i>	9
<i>Purpose</i>	20
<i>Research Questions</i>	20
<i>Definitions of Key Terms</i>	21
<i>Overview of Method</i>	24
<i>Basic Assumptions</i>	25
<i>Summary</i>	25
Chapter 2: Review of Literature	27
<i>Toulmin’s Model as a Heuristic for Analyzing Argumentative Discourse</i>	28
<i>Analysis of Argumentative Dialogue</i>	29
<i>Analysis of Persuasive Essays</i>	31
<i>Comprehending Written Argument</i>	37
<i>Development in Argumentative Thinking and Argument Evaluation</i>	52
<i>A Model of Argumentative Thinking and Reasoning</i>	68
<i>A Model of Critical Reading</i>	70
<i>The Influence of Persuasion on the Critical Reading of Argument</i>	73
<i>Text Sidedness Affects Persuasiveness</i>	73
<i>Content Affects Persuasiveness</i>	83
<i>Summary</i>	94
Chapter 3: Method	96
<i>Participants</i>	96
<i>Classroom Contexts</i>	98
<i>Materials</i>	100
<i>Texts</i>	100
<i>Response Tasks</i>	107
<i>Procedures</i>	117
<i>Pilot Study</i>	117
<i>Main Study</i>	119
<i>Data Analysis</i>	120
<i>Quantitative Data Analysis</i>	121
<i>Verbal Protocol Analysis</i>	124

Chapter 4: Results and Discussion.....	132
<i>Comprehending Written Argument in Persuasive Text</i>	133
<i>Identifying the Author’s Purpose</i>	133
<i>Identifying the Author’s Argument</i>	137
<i>Summary: Comprehending Written Argument</i>	145
<i>Evaluating Argument in Persuasive Text</i>	146
<i>Changing Beliefs and Perceived Knowledge in Persuasive Text</i>	156
<i>Belief Change</i>	156
<i>Content-Specific Belief Change</i>	163
<i>Perceived Knowledge Change</i>	168
<i>Beliefs Relative to Perceived Knowledge</i>	174
<i>Summary: Changing Beliefs and Perceived Knowledge in Persuasive Text</i>	175
<i>Summary</i>	177
 Chapter 5: Verbal Protocol Results	179
<i>Online Reading Processes in Persuasive Text</i>	180
<i>Online Evaluating Processes</i>	180
<i>Online Interpreting Processes</i>	182
<i>Restating Text and Inference-Making</i>	185
<i>Connected Processing During Reading</i>	186
<i>Online Processing Relative to Text Sidedness and Content</i>	189
<i>Summary</i>	190
<i>Postreading Processes: Identifying the Author’s Purpose</i>	191
<i>Author’s Purpose Processing Relative to Text Sidedness</i>	195
<i>Summary</i>	197
<i>Postreading Processes: Identifying the Author’s Argument</i>	197
<i>Main Point Processing</i>	198
<i>Main-Point Processing Relative to Text Sidedness</i>	200
<i>Identifying the Supporting Detail</i>	203
<i>Supporting-Detail Processes Relative to Text Sidedness</i>	205
<i>Summary</i>	207
<i>Postreading Processes: Evaluating Argument</i>	208
 Chapter 6: Conclusion and Implications for Research and Instruction	213
<i>Summary of Major Findings</i>	214
<i>Comprehending Argument in Persuasive Text</i>	216
<i>Evaluating Argument in Persuasive Texts</i>	219
<i>Changing Beliefs and Knowledge in Persuasive Text</i>	223
<i>The Influence of Sidedness and Content in Persuasive Text</i>	227
<i>The Influence of Sidedness in Identifying Argument</i>	228
<i>The Influence of Sidedness and Content in Evaluating Argument</i>	229
<i>The Influence of Sidedness and Content on Belief Change</i>	231
<i>The Influence of Sidedness and Content on Knowledge Change</i>	232
<i>Directions for Future Research</i>	234
<i>Comprehending Written Argument</i>	234
<i>Evaluating Argument</i>	235

<i>Measuring Changing Beliefs and Knowledge</i>	236
<i>Measuring Effects of Text Sidedness</i>	237
<i>Measuring the Influence of Instruction</i>	237
<i>Suggestions for Instruction</i>	238
<i>Instruction in Argument and Persuasion</i>	238
<i>Instruction in Evaluating Argument and Persuasion</i>	241
<i>Selecting Texts</i>	243
<i>Limitations</i>	244
<i>Conclusion</i>	244
 Appendix A: Persuasive Articles and Argument Representations	 247
Appendix B: Reading Task Booklets.....	258
References.....	311

List of Tables

Table 1. Reading Task Administration Schedule.	120
Table 2. Verbal Protocol Online Processing Coding Patterns, Descriptions, and Signals.	125
Table 3. Verbal Protocol Author’s Purpose Identification Coding Patterns, Descriptions, and Signals.	127
Table 4. Identifying the Argument Codes Patterns, Descriptions, and Signals.....	129
Table 5. Verbal Protocol Evaluative Reasoning Coding Patterns, Descriptions, and Signals.	130
Table 6. Frequencies and Percents for the Author’s Purpose Measure by Text Sidedness and Grade.	136
Table 7. Frequencies and Percents for the Author’s Purpose Measure by Class.....	137
Table 8. Frequencies and Percents for the Main Point Measure by Text Sidedness and Grade.	140
Table 9. Frequencies and Percents for the Main Point Measure by Class.....	141
Table 10. Frequencies and Percents for the Supporting Detail Measure by Text Sidedness and Grade.	144
Table 11. Frequencies and Percents for the Supporting Detail Measure by Class.	145
Table 12. Mean Frequencies and Standard Deviations for the Evaluative Reasoning Measure (0-4).	148
Table 13. Mean Frequencies and Standard Deviations for the Evaluative Reasoning Measure (0-4) by Class.	149
Table 14. Means and Standard Deviations for the Evidence-Basis Measure (0-1) by Premise Statements for Grade and Text Sidedness.....	152
Table 15. Analysis of Variance Results for Main Effects and Interaction Effects of Grade and Text Sidedness on Evidence-Basis Selections.	153
Table 16. Means and Standard Deviations for the Knowledge- and Belief-Basis Measures (0-1) by Premise Statements for Grade and Text Sidedness.....	154
Table 17. Analysis of Variance Results for Main Effects and Interaction Effects of Grade and Text Sidedness on Knowledge- and Belief-Basis Selections.....	155
Table 18. Means and Standard Deviations for Belief Ratings (0-130) Before and After Reading for Grade and Text Sidedness.....	159
Table 19. Analysis of Variance Results for Main Effects and Interaction Effects of Grade and Text Sidedness on Belief Change.....	160
Table 20. Means and Standard Deviations for Belief Ratings (0-130) Before and After Reading for Class.	162
Table 21. Analysis of Variance Results for Main Effects and Interaction Effects of Class on Belief Change.....	163
Table 22. Means and Standard Deviations for Content-Specific Belief Ratings (0-130) During Reading for Grade and Text Sidedness.....	165

Table 23. Analysis of Variance Results for Main Effects and Interaction Effects of Persuasive Content on Belief Change During Reading by Text Sidedness and Grade.	166
Table 24. Means and Standard Deviations for Content Specific Belief Ratings (0-130) During Reading for Class.	167
Table 25. Analysis of Variance Results for Main Effects and Interaction Effects of Persuasive Content on Belief Change During Reading by Class.	168
Table 26. Means and Standard Deviations for Knowledge Ratings (0-130) Before and After Reading for Grade and Text Sidedness.	170
Table 27. Analysis of Variance Results for Main Effects and Interaction Effects of Grade and Text Sidedness on Perceived Knowledge Change.	171
Table 28. Means and Standard Deviations for Perceived Knowledge Ratings (0-130) Before and After Reading for Class.	173
Table 29. Analysis of Variance Results for Main Effects and Interaction Effects on Perceived Knowledge Change by Class.	174

List of Figures

<i>Figure 1.</i> Three stages of argument comprehension (Chambliss, 1995).....	50
<i>Figure 2.</i> Developmental continuum in argumentative thinking (Kuhn, 1989).	69
<i>Figure 3.</i> A developmental model of critical reading (Chambliss, 1995; Chambliss & Murphy, 2002; Kuhn, 1989).....	71
<i>Figure 4.</i> A Graphic Representation of the One-sided Argument in “Zoos Harm Animals”	104
<i>Figure 5.</i> A Graphic Representation of the Two-sided Refutation Argument in “Zoos Are Cruel”	105
<i>Figure 6.</i> A Graphic Representation of the Two-sided Nonrefutation Argument in “Are Zoos Cruel?”	106
<i>Figure 7.</i> Belief Change by Text Sidedness Interaction.....	161
<i>Figure 8.</i> Perceived Knowledge Change by Text Sidedness Interaction.....	172

Chapter 1: Introduction

In today's technologically advanced society, children through adults are challenged to think critically about text they encounter in school, in the workplace, and at home. McCombs, Kirby, Barney, Darilek, & Magee (2004) argued in a recent RAND Corporation report that in order to succeed in education or in the work place students need critical thinking skills for comprehending a variety of texts. A consensus on the importance of thinking critically about text, or *critical reading*, has long been established (Brooks & Warren, 1972; Buehl, Alexander, Murphy, & Sperl, 2001; Dawson, 1968; King, Ellinger, & Wolf, 1967; McCombs et al., 2004; Stevens, 2003). Broadly speaking, the purpose of critical reading at any age is to develop insightful readers to meet the challenges of our society by developing in students a healthy skepticism toward messages conveyed in written texts (Qaintance, 1968; Simmons, 1968). An insightful but skeptical reader has developed the skill of judging well or withholding judgment until there is adequate evidence, thereby preventing biased judgment (Artley, 1968; Jenkinson, 1968). By reading critically, students analyze an idea more closely or from an alternate perspective (Buehl et al., 2001).

Critical reading requires an awareness of authors' intentions and purposes as well as a metacognitive awareness of one's personal biases. Smith (1968) argued that if students cannot think for themselves they learn to accept what is written or heard as the truth. But if they are aware of the author's apparent or inherent influence on their thinking, and have developed the necessary mental processes involved, students can construct deeper meaning by thinking and reading critically. Similarly, Spache (1964) argued that students can learn that they do not have to passively accept the author's

viewpoint; that they can be mindful of the author's intention, and react to it thoughtfully and critically. For instance, if students are taught to look for biases and propaganda, they may be in a position to judge the validity of statements that they read in all texts.

However, students may not automatically develop these skills.

Critical reading is of national importance to policy makers who regularly assess the reading performance of fourth-, eighth-, and twelfth-graders across the nation on the National Assessment of Education Progress or NAEP (National Center for Education Statistics [NCES], November 2003). Although NAEP is not an assessment of critical reading abilities per se, it was designed to measure levels of reading comprehension, including critical reading. For instance, according to the *NAEP reading achievement level* descriptors, the *Basic* level of reading performance requires that eighth grade students recognize devices authors use in composing text, such as devices used to persuade the reader (NCES, 2005). At the *Advanced* level, students are required to take a critical stance toward texts and to judge specific aspects of text (Loomis & Bourque, 2001; NCES, September 2003). Sample NAEP questions that assess students' critical analysis and evaluation skills on the eighth-grade reading test include: "What is the main purpose of the article?" "The title and photograph on the first page of the article are probably meant to..." "If you could talk to the author of this article, what is one question you could ask her that is not already answered in the article?" (NCES, September 2003). These types of questions require critically thinking about text, but students do not appear to be performing all that well.

The problem of poor reading performance among fourth-, eighth-, and twelfth-graders was captured in a recent report by the RAND Corporation (McCombs et al.,

2004). McCombs et al.'s (2004) findings indicated that in no state do even half the students meet the NAEP national literacy standard of proficient. Overall, state proficiencies ranged between 10% and 43% for eighth-graders who took the NAEP in 2003. The average state proficiency rate of eighth graders was 32%. This result means that a majority of readers failed to make inferences, draw conclusions, or make clear connections. It also means that students failed to identify and analyze some of the devices authors use in composing text (NCES, 2005). Stevens (2003) of the National Assessment Governing Board for the NAEP explained that our students lack the ability to analyze, reason and extend or apply what is read, abilities that proficient reading requires.

It would appear from past NAEP results that overall reading performance has not significantly improved among most eighth-grade students across the nation (McCombs et al., 2004; Stevens, 2003). Unfortunately, the 2002 average reading scale scores for eighth graders were not significantly different from those reported on the 2003 NAEP (NCES, 2003). The 2002 NAEP reading assessment results indicated that the percentage of eighth-grade students at the *Proficient* level of reading performance was 33%, (Jerry & Lutkus, 2003). Furthermore, the 2005 NAEP reading assessment results decreased a point for eighth graders (NCES, 2005). Although lower- to middle-performing students regained a point on the 2007 NAEP, the percentage of students at the proficient level remained the same as the 2005 level (NCES, 2008). Because the overall performance on the NAEP for eighth-graders over the past five years has not significantly increased (Stevens, 2003) and in some cases decreased (NCES, 2005), it seems apparent that the reading performance of these students is not keeping pace with the higher degrees of literacy expected of graduates in a technologically advanced society.

Part of the problem may be that students are expected to comprehend and analyze persuasive text on the NAEP and state assessments in reading, yet their textbooks provide them with very few encounters with persuasive text (Calfee & Chambliss, 1988; Chambliss & Calfee, 1989, 1998). Brooks and Warren (1972) argued that it becomes increasingly important for students to increase their awareness of how words work in persuasive texts to manipulate opinion. Persuasion involves convincing the reader to accept an opinion or to adopt an attitude, belief, or feeling, or it may involve persuading the reader to take action. Persuasion plays a central role in our society because it is a technique that is commonly used as an instrument of democracy (Smith, 1974) and the media (Miller, 1980). At its best, persuasion can be viewed as a neutral tool, encouraging readers to analyze an idea more closely or from an alternate perspective (Brooks & Warren, 1972; Buehl et al., 2001). At its worst, persuasion can be used irresponsibly to accomplish a desired result (Brooks & Warren, 1972). Thus, it becomes important for students to be able to analyze persuasive discourse so that they can comprehend and evaluate the argument presented.

But due to the apparent lack of academic experience with persuasive text, typical readers may have a limited argument schema, or knowledge of the structure of argument, which could hinder the comprehension of argument structures such as those present in persuasive text. Good readers have an argument schema well represented by the Toulmin model (1958) of argument that they can use to reconstruct the gist of lengthy argument text (Chambliss, 1995). In addition, by eighth-grade students are expected to recognize information included by an author to persuade the reader (NCES, 2005), and evaluate text content to determine the author's purpose and the effectiveness of the author's thesis

(State Board of Education, 2006). If students lack experience with persuasive text, they may also be unaware of techniques authors use to persuade their audience, such as appealing to the readers' emotions.

Rationale

If students lack experience with persuasive text, they could also lack the knowledge of strategies for analyzing and evaluating argument. Strategies good readers use to analyze persuasive messages differ from strategies good readers use to analyze exposition whose purpose is strictly to inform the reader rather than to argue or to persuade (Chambliss, 1995). Critical reading strategies used to analyze persuasive text might include the following: (a) identifying the author's purpose, point of view, argument structure, expertise, bias, accuracy, or intended audience, (b) recognizing social context and persuasive strategies or techniques the author uses to construct the text, and (c) weighing the evidence presented in support of a claim (Haas & Flower, 1988; Hobbs & Frost, 1998, 2003; Huss, 1968; Kuhn, 1989, 1991, 1992; Miller, 1980; Silverblatt, 1995; Spache, 1964; Thoman, 1999; Thoman & Jolls, 2005).

Students and teachers bring with them varying skill levels in the identification, interpretation and evaluation of persuasive messages (Walton, 1989). According to research, arguers of all ages, from preschool age children to adulthood, have shown that their naturally occurring argumentative dialogues contain all the central parts of an argument (Anderson, Chinn, Chang, Waggoner & Yi, 1997; Felton & Kuhn, 2001; Kuhn, 1992; Resnick, Salmon, Zeitz, Wathen, & Holowchak, 1993; Stein & Albro, 2001; Stein & Bernas, 1999). Likewise, children and adolescents demonstrated use of basic argumentative discourse skills when composing persuasive essays (Crammond, 1998;

Golder & Coirier, 1994; Reznitskaya et al., 2001). Students appear to have a basic knowledge of argument structures as evidenced in their dialogues and written compositions; however, when the task at hand is to comprehend, analyze, or evaluate written argument, their knowledge and skill seems to be much less developed (Chambliss & Murphy, 2002; Golder & Coirier, 1994; Larson, Britt, & Larson, 2004).

Readers Comprehending and Analyzing Argument

Although reading standards require students to comprehend, analyze, and evaluate a variety of texts during their years in school, students do not appear to be as familiar with argument. For example, Golder and Coirier's (1994) work revealed that students between the ages of 12 and 16 years rated text containing complex argument structures (e.g., counterarguments) to be as argumentative as text containing minimal argument structures (e.g., claim and self-centered support). In fact, 10- to 12-year-old students identified text as argument when just a claim was presented suggesting that stating one's opinion qualifies as an adequate argument (Golder & Coirier, 1994). Younger students of ages 10 and 11 were even less successful at rating complex argument, rating it instead as nonargument (Golder & Coirier, 1994). The work of these researchers indicates that preadolescents through adolescents may be relatively unfamiliar with the basic parts of an argument as well as more complex argument structures present in persuasive text.

Moreover, research in the comprehension of argument revealed the same poor results among children and adults (Chambliss & Murphy, 2002; Larson, Britt, & Larson, 2004). For example, Chambliss and Murphy (2002) found only a small proportion of accurate argument representations when fourth- and fifth-grade readers were asked to recall the passage read. Likewise, Larson et al. (2004) reported that argument

identification was low among college students, many identifying general statements as the main claim and others identifying supporting reasons and counterarguments as the main claim. Whereas many children through adults appear to use the basic elements of the argument structure proposed by Toulmin (1958) in argumentative dialogue and persuasive essays (Anderson et al. 1997; Crammond, 1998; Felton & Kuhn, 2001; Golder & Coirier, 1994; Kuhn, 1992; Resnick, Salmon, Zeitz, Wathen, & Holowchak, 1993; Reznitskaya et al., 2001; Stein & Albro, 2001; Stein & Bernas, 1999), recognizing and comprehending written argument seems to be quite a bit less well-developed.

Nevertheless, competent adolescent readers have shown evidence of argument schema and strategy use for recognizing argument text as well as for identifying elements of an argument and reconstructing the author's argument after reading. Chambliss's (1995) work with advanced high-school seniors revealed strategies that good readers use to comprehend lengthy written argument, but to infer possible instructional approaches for middle-school readers based on what successful readers do as seniors may be risky. To infer possible instructional approaches based on Golder and Coirier's findings (1994) with middle-school readers would be just as risky because their work involved the use of short argumentative texts containing three to four sentences. Whereas Chambliss and Murphy's (2002) work with fourth- and fifth-graders provided insight into how children comprehend lengthy argument, further research is needed to explore how middle-school readers comprehend and analyze lengthy written argument.

Development in Argument Comprehension

Research has proposed a model of how children comprehend argument. Based on comprehension models that describe how adult readers represent the structure of

expository texts, Chambliss and Murphy (2002) proposed a possible developmental sequence on how children represent written argument. This sequence extended from children representing argument as a list of details to children representing the accurate argument structure, with different levels of partial representations including the topical representation in between. The four processing models Chambliss and Murphy proposed were: (a) the *structure strategy* (Meyer, 1985; Meyer, Brandt, & Bluth, 1980; Meyer & Freedle, 1984), (b) *macroprocessing* (Kintsch & van Dijk, 1978; van Dijk, 1980), (c) the *general topic strategy* (van Dijk, 1980), and (d) the default *list strategy* (Meyer et al., 1980).

Chambliss and Murphy (2002) found that most children represented text with a hierarchical structure containing a main idea and supporting details, such as the argument structure or topical net, rather than a nonhierarchical structure, such as listing details. Chambliss and Murphy characterized these children as using a *structure strategy* (Meyer, 1985; Meyer et al., 1980; Meyer & Freedle, 1984). Other children performed as if they had inferred the specific discourse topic or argument structure using *macroprocessing* (Kintsch & van Dijk, 1978; van Dijk, 1980). According to the macroprocessing model, readers rely on semantic structures in the text to infer a macrostructure that subsumes the text information, such as the gist or main idea of a text (Kintsch & van Dijk, 1978; van Dijk, 1980), or the author's rhetorical structure for a text, such as the informational text structure or the argument text structure (Chambliss & Calfee, 1998, Chambliss & Murphy, 2002).

On the other hand, many children accurately recalled the general discourse topic (van Dijk, 1980) rather than the specific discourse topic (e.g., the author's claim) and

listed details that were subsumed by the general discourse topic rather than listing details in support of the author's claim. Chambliss and Murphy (2002) referred to this type of processing as the *general topic strategy*. In addition, many fourth graders and some fifth graders performed as if they did not have a text schema that they could use to represent an argument text (structure strategy) and also could not infer a structure from patterns in the text (macroprocessing). These students listed details as both the author's claim and supporting data with no attempt to interrelate them—the default *list strategy* (Meyer et al., 1980).

The differences among fourth and fifth graders' answers suggested to Chambliss and Murphy (2002) that children may become progressively more able to represent the specific structure in an argument. Fifth graders were more likely than fourth graders to represent an argument hierarchically and were more able to infer the claim of the text. Whereas it is likely that sometime during the fifth grade some students become able to notice and use patterns in a text to infer a global structure, this developmental trend is only speculative beyond fifth graders (Chambliss & Murphy, 2002) until we explore the possibilities among middle-school readers.

Development in Argument Analysis and Evaluation

Stein and Miller (1991) provided a model of the development of argumentative skill within a social context. Their model focused on people's goals for arguing, the types of evidence they use to substantiate claims, and the ways in which these two aspects of argumentation change with age. They explained that the earliest forms of argument come from the need to satisfy both personal and social goals, usually within the context of conflict and dispute. Within this context, children as young as five years old understand

the structure of a disputative argument (i.e., that the opponent holds a viewpoint that conflicts with their own) that this viewpoint impedes their achievement of a goal, and that they must intercede for their goal to prevail over their opponent's goal. Thus, children's initial understanding of the structure of an argument resembles that of disputative argument or of conflict resolution.

As children begin to understand, value, and accept social and cultural modes of appropriate interaction, they begin to make the shift from disputative argument to reasoned interaction, or interactive argument (Stein & Miller, 1991). According to Stein and Miller, there are three levels of development within interactive argument: The level of argumentation at which (a) assertions are justified solely on the basis of personal beliefs, (b) reasoning is learned, usually through explicit intervention, and where evidence is based on knowledge of social norms, and (c) participants broaden their perspective to include the needs of others or society as a whole.

In a series of studies that focused on the understanding of and the reasoning associated with interactive arguments, Stein and Miller (1991) found developmental differences between groups of children and adults. Whereas second graders reasoned more from their beliefs, sixth graders and adults showed more variability in their reasoning. According to Stein and Miller, this developmental difference in decision making is the result of a difference in social norms used as criteria for evaluation. The results of Stein and Miller's studies (1991, 1993) indicated that beliefs about appropriate social norms vary significantly across the lifespan and that these beliefs directly influence the position chosen in an interactive argument and the types of evidence used to support this position. Thus, asking people how strongly they support a position and asking them

how much knowledge they have about a position appear to be essential when examining argumentative thinking.

Research in persuasion demonstrated the influence of perceived domain knowledge and beliefs on the persuasiveness of argument among young adults, adults and experts (Alexander, Buehl, & Sperl, 2001; Alexander, Murphy, Buehl, & Sperl, 1998; Buehl et al., 2001; Lord, Ross, & Lepper, 1997; Slater, 1998; Stein & Miller, 1991, 1993). Alexander et al., (2001) demonstrated that domain knowledge among adults can influence the persuasiveness of a given message. For example, adult readers with higher levels of initial perceived knowledge were less likely to be persuaded toward the author's view after reading. Buehl et al. (2001) argued that this finding provides tentative support for case building (Nickerson, 1991). Case building begins with a prior belief or conclusion and looks for evidence to support it. It involves the selective use of evidence that supports one's conclusion and the discounting of evidence that does not support one's conclusion. Thus, case building requires that evidence be used in biased ways (Nickerson, 1991). Buehl et al. (2001) suspected case building when they found that adult readers who rated their domain knowledge as high and possessed relatively strong beliefs on the issue at hand had maintained or increased support of their initial belief after reading.

Nickerson (1991) argued that an important reasoning skill is to be able to distinguish between evidence weighing (figuring out what to believe) and case building (defending an existing belief). He explained that evidence weighing, or evaluating evidence, has the goal of arriving at a conclusion supported by all of the evidence presented. The goal of evidence weighing is to get at the truth, whereas the goal of case

building is to make some claim believable, whether it is true or not. In evidence weighing, one searches for evidence and evaluates it objectively no matter what the particular issue. It includes actively seeking evidence that runs counter to a claim before accepting that claim as true. Evidence weighing means being careful to give special attention to evidence that weighs against conclusions one favors. It means making an effort to see situations from alternate points of view. In evidence weighing, one guards against developing and maintaining biased views.

Research within the realm of argumentative thinking and reasoning shows that typical readers do not weigh evidence (Chambliss, 1994; Kuhn, 1989; 1991, 1992; Kuhn, Amsel, & O'Loughlin, 1988). For instance, participants in Kuhn's studies either failed to acknowledge discrepant evidence or attended to it in a selective, distorting manner. In Kuhn's everyday thinking research, as well as her scientific reasoning work, children through adults did not evaluate evidence but rather looked for evidence to support their own theory or position. But as a result of these investigations, it was apparent to Kuhn that biased evidence weighing happened outside of one's metacognitive awareness and control.

According to Kuhn (1989), the minimum skills needed to weigh evidence are the ability to: (a) identify the evidence and represent it separately from a representation of the theory (belief or claim), (b) think about the theory itself rather than to simply think with it, and (c) temporarily set aside one's acceptance of the theory, in order to evaluate the evidence and its bearing on the theory. Kuhn (1989, 1991, 1992) depicted the differences between the process of argumentative thinking in children, lay adults, and experts in a developmental framework devised from her work in scientific thinking and everyday

reasoning. At the lower end of the developmental continuum, mental representations of evidence are not differentiated from theory (i.e., are not separate objects of cognition) thus no construction of relations between the two is possible and evidence weighing does not exist. At the other end of the continuum, mental representations of evidence are differentiated from theory and can therefore be acted on and evaluated relative to mental representations of alternative theories. Kuhn's work revealed that young children and many adolescents and adults exhibited characteristics from the lower end of the developmental continuum and did not sufficiently differentiate the evidence from the theory itself (Kuhn, 1989, 1992; Kuhn et al., 1988). Thus, only 15% of adolescents and adults were considered evaluative thinkers in which knowing is regarded as a process that entails thinking, evaluation, and argument (Kuhn, 1992).

Kuhn (1989, 1992) concluded that younger participants (third graders) do not exercise control over their thinking as they interpret evidence and revise theories but allow belief bias to affect their evidence weighing unaware that they are doing so. Whereas children have weak metacognitive skills, Kuhn determined that adolescents (ninth graders) and adults do much better. Many can differentiate between theories and evidence, and can reflect on how the two relate to one another. Other adolescents do not, which resulted in the variation of reasoning skills observed in Kuhn's work (1992). It was especially significant to Kuhn that the variation one would expect between early adolescence (sixth graders) and early adulthood (ninth graders) did not exist while most variation existed among college-bound and noncollege-bound adolescents (Kuhn, 1992). Further research investigating middle-school students' online evaluating skills by grade could help to illustrate developmental differences in argumentative thinking between

grades six and nine.

The Influence of Persuasion on Critical Reading

Persuasive text has both structure and content features that are unique to the genre. Research has shown that both features influence the persuasiveness of the author's message presented in the text read.

The effectiveness of persuasive text structures. Persuasive text structures are usually encountered in texts such as advertisements, newspaper articles, editorials, fliers, essays, speeches, as well as textbooks written as argument or explanation, book reports, research papers and scientific debate (Chambliss, 2001; Garner & Hansis, 1994; Golder & Coirier, 1994). The author's purpose to persuade or argue determines the overall organization or structure of the final text (Brooks & Warren, 1987; Chambliss, 2001). For example, the argument in persuasive text usually follows a basic structure that Toulmin (1958) first proposed as the *claim-datum-warrant* pattern of argument (Chambliss, 2001; Voss & Van Dyke, 2001). According to Toulmin's model, *backing* is the fourth part of an argument, and *qualifiers* and *rebuttals* are the fifth and sixth parts. Complex argument usually contains one or more of the latter argument parts.

When considering the structure of persuasive text, research refers to text *sidedness* (i.e., how the author handles opposing viewpoints) and explicates three types: (a) one-sided persuasive discourse, (b) two-sided refutation, or (c) two-sided nonrefutation (Allen, 1991; Allen, Hale, Mongeau, Berkowitz-Stafford, Stafford et al., 1990; Buehl et al., 2001; Hale, Mongeau, & Thomas, 1991). One-sided persuasive text presents an argument from only one perspective on a given issue. When an author includes opposing arguments (counterarguments) as well as arguments in favor of a

particular view, then the structure of persuasive text becomes two-sided. With two-sided persuasive text, the author may or may not take a neutral stance. If the author takes a neutral stance and presents both sides of the issue objectively, the two-sided text is said to be nonrefutational. If the author does not objectively present arguments for both viewpoints and refutes the opposing arguments, the text is described as refutational.

Depending on sidedness, argument structure in persuasive text plays a significant role in persuading the adult reader. For example, research supports that the most effective persuasive texts for adults are those that include counterarguments and are structured as refutation, followed by one-sided persuasive texts and finally two-sided texts with no refutation (Allen, 1991; Allen et al., 1990; Buehl et al., 2001; Hale et al., 1991).

The two-sided refutation text structure might be more effective than others in changing adult's beliefs for several reasons. Hale et al. (1991) suggested that direct refutation of an opposing argument may increase the perceived strength of the argument presented rendering it more persuasive. But with nonrefutational two-sided text, the adult reader may have trouble comparing the arguments and thus perceive them to be weaker than when the author directly refutes opposing arguments rendering nonrefutation less persuasive. For one-sided persuasion, the adult reader may perceive arguments as being weaker than for two-sided refutation because mention of opposing arguments is missing rendering one-sided argument as less convincing (Hale et al., 1991).

Although certain persuasive text structures are more effective in changing adult's beliefs, the increased persuasiveness of two-sided refutation may also enhance the adult reader's ability to comprehend the author's main point. Murphy (2001) found that college-educated adults rated articles that were two-sided refutation as the most

persuasive articles. When asked to state the author's main idea for all articles, participants were more likely to state the author's main idea as a claim than a statement or a topic for the two-sided refutational articles.

But little is known about the effectiveness of persuasive structures among middle-school readers. It is possible that text sidedness may play a similar role in persuading the middle-school reader as it does with adults. For instance, it is possible that for middle-school readers, the stronger the perceived argument is, the more persuasive the message, which is the case when adults read two-sided refutation. It is also possible that two-sided messages that contain direct refutation may assist the middle-school reader in identifying and comprehending the author's argument, which was the case for adults in Murphy's (2001) study.

However, middle-school readers may not have a schema for complex argument or two-sided refutation and thus, not be able to recognize counterargument or be able to comprehend them. Research indicated that children have difficulty identifying even the basic elements of an argument (i.e., claim and evidence) (Chambliss & Murphy, 2002; Golder & Coirier, 1994; Kuhn et al., 1988). But research also revealed that adults have trouble distinguishing between the basic parts of an argument and thus, comprehending it (Larson et al., 2004; Kuhn, 1992; Kuhn et al., 1988). Yet, persuasive text containing counterargument and refutation was most effective in changing adults' beliefs on a given topic (Allen, 1991; Allen et al., 1990; Buehl et al., 2001; Hale et al., 1991). In addition, adults were more likely to state the author's main point as a claim than a topic or general statement when the article was structured as two-sided refutation (Murphy, 2001).

In any case, one cannot generalize work with adults to middle-school readers. It

seems worthy to explore the influence of sidedness on middle-school readers' comprehension of argument and essential to investigate their level of development in evaluating argument in persuasive text to further inform instruction.

The effectiveness of persuasive content. Characteristics of the content of persuasive text are important in persuading the reader (Alexander et al, 2001; Chambliss, 1994; Murphy, 2001). For example, Aristotle described three means of persuasion: appealing to the character and credibility of the speaker; appealing to the emotions of the audience; or demonstrating the truth in an idea by appealing to reason (Brooks & Warren, 1987; Chambliss, 1994; Cooper, 1932; Voss & Van Dyke, 2001). Writers and speakers use persuasive language directed toward the audience with the end goal being to persuade the audience to agree with their viewpoint. Brooks and Warren (1972) noted that when authors use persuasive language, they may emphasize only one or more points, only what is necessary for assent, or offer as little proof as necessary to keep the reader emotionally committed to the issue at hand rather than the whole case. Thus, the nature of the information chosen by the author to persuade the reader may influence the degree to which the audience is persuaded.

Alexander et al. (2001) found evidence that the persuasiveness of an argument may depend upon how the author presents the topic, more emotionally or more factually. Does the author argue his/her viewpoint using knowledge-based information or with information that appeals to the readers' emotions? Alexander et al. found that a refutational two-sided text that relied more on factual support was more persuasive in changing adult readers' initial beliefs than a refutational two-sided text that relied heavily on emotional appeals. However, due to the nature of the issue advocated in the latter text,

readers' prereading beliefs in this particular study were already highly favorable, leaving limited room for persuasion to occur. This study demonstrated the importance of considering the nature of the topic, how that topic is argued, and the importance of reader's initial beliefs on the topic being argued. Murphy's (2001) work corroborates the importance of how the topic is argued. She found that evidence presented in multiple forms in support of a claim was the most persuasive factor for adults. The second most persuasive factor for adults was affect or how the content the author chose to present reader evoked their emotions.

In many cases, speakers and writers use *contentious content* to vanquish opposing views. In contentious argument, arguers appear to reason to a conclusion from premises (or "warrants") that appear to be generally accepted but in reality are not (Secor, 2003). In other words, the reader or observer may hold different views from which the writer or speaker argues, and those differences may not be clearly expressed. For example, in an article on zoos written by the People for the Ethical Treatment of Animals (PETA), the metaphor of zoos as caretakers and protectors of threatened and endangered wild animals is refuted using examples of mistreatment and research results. What the authors do not explicitly state is that they are arguing from the premise or warrant that animals have the same rights as humans, which in reality is not a generally accepted premise.

Aristotle described different techniques used by contentious arguers but indicated that refutation was the most effective (Secor, 2003). It is most powerful to refute one's opponent by successfully challenging the conclusion, premises, or principle of inference (warrants) upon which the argument depends (Secor, 2003). This is consistent with Hale et al.'s (1991) hypothesis mentioned earlier; that direct refutation of an opposing

argument may increase the perceived strength of the argument presented, thereby influencing the reader to accept the advocated claim.

Furthermore, DeMorgan (1847) pointed out that contentiousness affects the actual use of language in argument, leading arguers to exaggerate the strength of their claims through the use of overstatements and excessive generalizations (Secor, 2003). For example, in an article on zoos, PETA makes the argument that all zoos are bad (i.e., “pitiful prisons”) and supports the statement with two instances of zoo-related animal abuse and a study that showed evidence of stress-related behaviors among certain carnivores. The author’s use of generalization based on isolated instances and only certain species of carnivores may exaggerate the strength of the argument leading the reader to perceive its strength to be very strong (and possibly more highly persuasive).

Secor (2003) assures us that examples of informal contentious argument are widespread (e.g. letters to the editor), are worthy of our attention, and need to be evaluated accordingly. However, research is needed to explore how children of all ages comprehend, analyze, and evaluate contentious argument. So far, researchers have explored children’s argument comprehension and analysis by designing texts that focused on noncontentious argument (Chambliss, 1995; Chambliss & Murphy, 2001, Golder & Coirier, 1994). To be sure, researchers have explored how adults comprehend, analyze, evaluate, and are persuaded by contentious argument containing persuasive content (Alexander et al., 1998; Alexander et al., 2001; Buehl et al., 2001; Kuhn, 1992; Larson et al., 2004; Lord et al., 1979). But little is known concerning how middle-school readers between the ages of 11 and 15 comprehend, analyze, and evaluate contentious argument or persuasive content. Because readers are more likely to encounter argument containing

contentious argument than not (Chambliss, 1995) and persuasive content, it seems essential to investigate the effect of contentious content on the comprehension, analysis, and evaluation of argument among middle-school readers prior to designing instructional approaches with persuasive text.

Purpose

The purpose of this research was to explore sixth-, seventh-, and eighth-grade readers' comprehension, analysis and evaluation of lengthy written persuasion containing contentious argument and emotional content. First, this research specifically investigated what middle-school readers identify as the author's purpose and argument (i.e., claim and evidence) in persuasive text. Second, this study examined the influence of text sidedness and persuasive content on middle-school readers' beliefs and perceived knowledge. Third, this work explored how middle-school students' evaluate argument when supporting evidence contains emotional content. Finally, this research described how middle-school readers' process persuasive text relative to text sidedness and content.

Research Questions

The following questions guided my research:

1. What author's purpose do middle-school students assign to persuasive text relative to text sidedness?
2. What do middle-school students identify as the main point and supporting detail of persuasive text relative to text sidedness?
3. How do middle-school readers evaluate argument in persuasive text relative to text sidedness?

4. How convincing is persuasive text to middle-school readers relative to text sidedness?
5. How convincing is the content of persuasive text to middle-school readers?
6. What is the impact of sidedness on middle-school readers' perceived knowledge?
7. What is the relationship between perceived knowledge to belief change?
8. How do middle-school readers process persuasive text?

Definitions of Key Terms

Argument

Argument is the form of discourse with the purpose of persuading the reader by appealing to reason and is considered an inherent feature of persuasive discourse.

(Brooks & Warren, 1972; Crammond, 1998; Voss & Van Dyke, 2001). Brooks and Warren defined reason as,

The mental operation by which we move from what we take as the starting point—the *data*, the *premises*, the *evidence*—to the conviction that, with such a starting point, a certain *conclusion* will follow. To state it differently, to reason is to make an *inference*—to accept the conclusion as a consequence of having accepted the particular starting point...(p. 120)

Belief

A *belief* is an individual's attitude, stance or position on a premise relative to a topic or issue (Beuhl et al., 2001).

Case Building

Case building is the selective use of evidence that supports one's conclusion and the discounting of evidence that does not defend one's existing belief or conclusion (Nickerson, 1991). It can be contrasted with evidence weighing, which has the goal of arriving at a conclusion supported by *all* of the evidence presented.

Contentious Content/Contentious Argument

In contentious argument, arguers appear to reason to a conclusion from premises (or warrants) that appear to be generally accepted but in reality are not (Secor, 2003). There are several techniques that contentious arguers use, but refutation is the most powerful (Aristotle, 1928; Secor, 2003).

Critical Reading

Critical reading is critical thinking about text (Artley, 1968; Ennis, 1968; Simmons, 1968; Smith, 1968; Wolf, King, & Huck, 1968). It involves the use of reading *skills* and *strategies* for analyzing and evaluating text. Critical reading skills and strategies might include identifying the author's purpose, point of view, argument structure, expertise, bias, accuracy, and intended audience, recognizing the social context and the author's use of persuasive techniques and strategies in constructing the text to persuade, and weighing the evidence presented against the author's claim (Haas & Flower, 1988; Hobbs & Frost, 1998, 2003; Huss, 1968; Kuhn, 1989, 1991, 1992; Miller, 1980; Silverblatt, 1995; Spache, 1964; Thoman, 1999; Thoman & Jolls, 2005).

Evidence-Based Reasoning

Evidence-based reasoning considers the evidence presented when evaluating an argument (Kuhn et al., 1988).

Persuasion

Persuasion is “the art...by which you get somebody to do what you want and make him, at the same time, think that this is what he had wanted to do all the time” (Brooks & Warren, 1972, p. 176). It involves persuading the reader to accept an opinion, to adopt an attitude, belief, or feeling, or to take action (Brooks & Warren, 1987; Cooper, 1932; Voss & Van Dyke, 2001).

Reading Skills

Reading skills involve behavior that is automatic, consistent, and unvarying, and are usually employed without deliberate planning or self-awareness of the reading process and its components (Afflerbach, Pearson, & Paris, 2008; Pearson, Roehler, Dole, & Duffy, 1991).

Reading Strategies

Reading strategies are characterized as deliberate, flexible plans the reader adjusts to fit the reading context in order to decode text, understand words, and construct meanings of text in contrast to something done automatically, such as a practiced skill. However, when practiced often enough, a reading strategy can become effortless and automatic, thus becoming a reading skill (Afflerbach, Pearson, & Paris, 2008).

Sidedness

Sidedness refers to how an author handles opposing viewpoints (Allen, 1991; Allen et al., 1990; Buehl et al., 2001). *One-sided* persuasive messages present an argument from only one perspective on a given issue. *Two-sided* persuasive messages present opposing arguments as well as arguments in favor of a particular view. In two-

sided nonrefutation, the author takes a neutral stance and presents both sides of the issue objectively. In two-sided refutation, the author refutes the opposing arguments.

Theory

A *theory* can be described as an idea, an opinion, or a belief that one claims to be true and for which (or against which) evidence may be presented (Kuhn et al., 1988).

Theory-based Reasoning

Theory-based reasoning is a response that makes reference to one's prior knowledge, beliefs, or feelings, as opposed to the evidence presented, when evaluating an argument (Kuhn et al., 1988). Theory-based reasoning includes using one's prior knowledge or beliefs to evaluate evidence presented in support of a theory or claim.

Overview of Method

The present study was a 3 (Grade Level) x 3 (Class) x 3 (Text Sidedness) x 2 or 4 (Repeated Measures) mixed design. The three grade levels were sixth-, seventh-, and eighth-grade students. The three classes were gifted reading, heterogeneous reading, and inclusion reading classes. The three persuasive texts were structured as one-sided argument, two-sided refutation, and two-sided nonrefutation. The repeated measures with two levels were belief ratings before and after reading, perceived knowledge ratings before and after reading, and content-specific belief ratings during reading. The repeated measures with four levels were evaluative reasoning scores for each of four premise statements. Texts were randomly assigned to students in each reading classroom. Outcome measures included a paper-and-pencil task assessing perceived knowledge, argument comprehension, argument evaluation, and belief change before, during, and after reading. I also collected several think-aloud protocols (Pressley & Afflerbach, 1995)

to further describe students' comprehension, analysis, and evaluation processes with each persuasive text structure. All students from grades six, seven, and eight who attended regular education reading classes in one middle school with parental consent participated in the study, a total of 357 students.

Limitations

One limitation is generalizability of the results to other middle-school students between the ages of 11 and 15 years. The students in the study were part of a middle-school community that was 94% White and 6% Hispanic, African-American, and Asian combined in a rural town of one Mid-Atlantic state. The results may only be generalizable to middle-school students with a similar demographic profile.

Basic Assumptions

One assumption made for this study is that a majority of students participating in the study were familiar with argumentative scripts (Golder & Coirier, 1994) and could generate the central parts of an argument as proposed by Toulmin (1958) when engaged in social discourse (Anderson et al., 1997; Stein & Albro, 2001). In addition, I was hopeful that by April of the school year a majority of students of middle-school age would be familiar with the basic elements of argument (i.e., claim and evidence) relative to composing persuasive essays based on Crammond's findings (1998) and the fact that persuasive writing was to be taught at each grade in the writing curriculum at this middle school.

Summary

This chapter presented the problem of critical reading relative to persuasive texts containing an argument structure and argued for further research involving middle-school

students. The present study explored how middle-school students perform with persuasive text containing contentious argument and emotional content in order to inform instruction in reading comprehension, including critical reading, and to advance the related fields of study. The next chapter provides elaborated support for this research.

Chapter 2: Review of Literature

Critical reading has traditionally been described as critical thinking applied to text (Artley, 1968; Ennis, 1968; Simmons, 1968; Smith, 1968; Wolf, King, & Huck, 1968). However, in the 1960's, during a period when the term, critical reading, was most prevalent, very few scholars attempted to define the complex notion. Many often restricted their definition to one or two specific aspects of critical reading, such as detecting propaganda devices or distinguishing between fact and opinion statements (see Dawson, 1968; see King, Ellinger, & Wolf, 1967). Others took a broader approach to defining critical reading. For instance, Spache (1964) defined critical reading as a type of reading that extends beyond recall, summarization and interpretation to evaluating and judging text, recognizing author's viewpoints and purpose, drawing inferences, distinguishing opinion and fact and detecting propaganda devices. Similarly, Wolf, King, and Huck (1968) defined critical reading as an analytical, evaluative type of reading in which the reader analyzes and judges both content and author aspects of text. To Wolf et al. (1968), reading critically involve determining the purposes underlying the author's message and making judgments about what was read based upon valid criteria. It was critical thinking applied to all kinds of text, including argumentative, informational, and literary (Wolf et al., 1968).

For the present study, critical reading was operationalized as *text analysis and comprehension*, which involves recognizing an author's purpose to persuade and identifying the author's argument, and as *text evaluation*, which involves weighing evidence against a claim or premise. Research to support this conceptualization of critical reading comes from the fields of argument comprehension (Chambliss, 1995; Chambliss

& Murphy, 2002; Golder & Coirier, 1994; Larson et al., 2004), argumentative thinking (Kuhn, 1992; Kuhn et al., 1988; Stein & Miller, 1991, 1993), and persuasion (Allen, 1991; Allen et al., 1990; Alexander et al., 2001; Alexander et al., 1998; Buehl, et al., 2001; Hale et al., 1991; Lord et al., 1979; Murphy, 2001; Slater, 1998).

Toulmin's Model as a Heuristic for Analyzing Argumentative Discourse

The Toulmin (1958) model has been used in research as a heuristic for analyzing the argumentative discourse of study participants and in analyzing the structure of argument used in research. Many textbooks on argumentation have advocated that students use Toulmin's (1958) model as a heuristic to analyze, evaluate and construct arguments (van Eemeren, Groetendorst, & Henkemans, 1996). It makes the structure of argumentative writing more transparent and provides a good starting point for its evaluation. In addition, the model is grounded in a theory of human argument and is adaptive to the various domains and purposes of argumentative discourse, including that of persuasion, due to its field-independence quality (Toulmin, 1958).

Research in the comprehension of argument has explored whether or not readers recognize argument as text written to argue, whether or not readers can identify the parts of the author's argument, and how well readers can use the author's argument structure to reconstruct a written representation of the author's message. What we have learned about how children dialogue, compose argument, and comprehend argument was more or less interpreted in light of Toulmin's (1958) model of argument, which I introduced in chapter 1.

Due to its significance in research and in the present study, I report on how Toulmin's model (1958) has been useful in research involving argumentative dialogue

and written composition. Then, I explain what we know concerning the comprehension of written argument relative to Toulmin's model and how the comprehension of written argument appears to be less well developed than verbal and written argument.

Analysis of Argumentative Dialogue

Children have learned to use knowledge of argument in their dialogues.

Anderson, Chinn, Chang, Waggoner & Yi's work (1997) demonstrated how children use argument when discussing literature. Anderson et al. investigated the properties of fourth-graders' naturally occurring arguments during Collaborative Reasoning (CR) (Waggoner, Chinn, Yi, & Anderson, 1995) discussions. Eighty-three boys and girls from four fourth-grade classrooms in two different schools participated. Two classrooms were located in a socioeconomically diverse rural public school and two classrooms were located in a parochial school in a small city serving primarily children from middle income families.

Reading groups of eight to nine students organized by reading level served as the discussion groups. All together there were 10 discussion groups, four at the rural public school and six at the parochial school. Participants first read the day's story silently at their seats and then the teacher initiated the discussion with a single, central question about a dilemma faced by the story characters. For example, after silently reading the story about a young Chinese American boy who changes his name because he wants to be accepted by his Anglo peers, the teacher asks the question "Should the boy have changed his name?" and the CR discussion proceeds from there.

During CR discussions, children indicate their initial positions by raising their hands, then offer reasons and supporting evidence for their positions. After listening to and evaluating each others arguments, students who disagree are encouraged to challenge

with counterarguments. Those challenged weigh the reasons and evidence offered and decide whether to maintain or change their original positions. Although initiated by the teacher, CR is carried out in an open participation structure where the teacher promotes independent thinking and self-management of turn taking through modeling, promoting, and encouraging. All teachers were trained in how to facilitate CR. After about 12 CR discussions, students knew what was expected of them and groups were running smoothly. Then two discussions per classroom were videotaped and transcribed to provide a total of 20 transcribed discussions for analysis.

Anderson et al. (1997) concluded that the form of children's arguments were acceptable from the perspective of one participating in the CR discussion when compared to formal argument. One major finding was that children's arguments were full of indeterminate pronouns and other apparently vague referring expressions. However, the missing or vague information was usually given in the story or easily inferred from their background experiences. It appeared to Anderson et al. that the discussion participants understood each other most of the time, thus context resolved referential ambiguities.

Anderson et al. (1997) also found that most of the arguments appeared to be missing important premises necessary to make a valid inference (i.e., very few of their arguments contained explicit warrants to authorize conclusions, and sometimes they did not explicitly express a conclusion). Nevertheless, the researchers found that the form of children's arguments was acceptable but from the perspective of one participating in the CR discussions.

Anderson et al. (1997) also noted that 20 discussions were videotaped during a baseline period of observation. During these discussions, much of the time was taken up

with recitation but that there were few if any utterances that could be construed as arguments. It is also noted that the researchers justifiably called student responses during CR “naturally occurring” based on the open participation structure that eliminates teacher instruction on complete or sound arguments. Nevertheless, students practiced CR thinking and discussion at least a dozen times prior to the researchers collecting data. Thus, the extent to which fourth- and fifth-graders naturally occurring arguments compare to formal argument structures prior to CR discussion training appears to be much less developed.

While Anderson et al.’s work (1997) with children discussing literature reveals how Toulmin’s model has been used to develop children’s argumentative thinking during CR discussions, Crammond’s work (1998) illustrates how Toulmin’s model was used to investigate the quality of students’ persuasive compositions.

Analysis of Persuasive Essays

Crammond (1998) noted that research indicates the effectiveness of Toulmin’s model in investigating the nature of persuasive writing. Crammond (1998) investigated the uses and complexity of argument structures in expert and sixth-, eighth- and tenth-grade student persuasive essays. The goal of her study was to identify developmental features and characteristic weaknesses of students’ persuasive writing by analyzing samples of their written essays. Crammond used a modified version of Toulmin’s (1958) model to analyze persuasive essays. Fifty-six students from two sixth-grade classes, 28 students from one eighth-grade class, and 27 students from one tenth-grade class were required to produce a written persuasive text in their English classes. Crammond randomly chose 12 of the essays for analysis. Seven expert writers were professional

writers who wrote argumentative texts—including persuasive types, such as editorial—for publication in various journals, magazines, and newspapers.

Crammond (1998) asked participants to generate an essay in response to a writing prompt that asked students to present and defend their opinions regarding the training of animals. Students could refer to a collage of black and white pictures depicting some of the ways that trained animals are used by humans as cues to help students access topic knowledge. She then analyzed the 12 subsets of student texts for the presence of argument substructures, including claims, data, and warrants, as well as several substructures present in complex arguments (i.e., modal qualifications, constraint qualifications, subclaims, reservations, countered rebuttals, and alternative solutions.)

To address the question concerning whether student and expert writers used argument structures in their persuasive essays, Crammond (1998) analyzed the writings for the number of texts in each group containing at least one argument structure. To address the questions concerning to what extent student and expert writers used argument structures, Crammond analyzed writings for (a) the proportion of text accounted for by argument structure(s), (b) the total number of arguments per text, and (c) the density of argument structures in each text.

Crammond (1998) found that with the exception of one grade-six student and one grade-eight student, all expert and student writers used at least one argument structure---claim-data---in their persuasive texts. In addition, all texts produced by expert writers and almost all texts produced by student writers contained argument structures and substructures linked to argument structures. Moreover, an ANOVA revealed a significant group effect on number of argument structures per text, with expert writers

using arguments more extensively than the student writers, regardless of text length. The results also revealed a significant difference between expert and students writers regarding argument complexity. Crammond concluded that the argument structure is clearly the predominant organizational framework on both student and expert persuasive writings and that it functions as a type of rhetorical superstructure. Crammond also demonstrated that the ability to produce a basic written argument is acquired at a relatively early age—at least by grade six.

The use of Toulmin's model (1958) has helped researchers to illustrate students' knowledge of argument, or argument schema, and how well that knowledge transfers from focused discussions to students' persuasive writings. Reznitskaya, Anderson, McNurlen, Nguyen-Jahiel, Archodidou, et al.(2001) investigated the influence of *Collaborative Reasoning* (CR) on the quality of fourth- and fifth -graders' written argument. During collaborative reasoning, the teacher coached students to take positions on each issue and to provide supporting reasons and evidence for their opinions, to challenge each other's viewpoints, offer counterarguments, respond to counterarguments with rebuttal, and ask for clarification as needed. In essence, the CR format taught students argumentation skill so that it could be generalized to a new situation (Reznitskaya et al., 2001).

Reznitskaya et al. (2001) hypothesized that 15 to 20 minutes in collaborative reasoning discussions for a five-week period, twice a week, would lead to better argumentative essay writing compared with writings by students in a classroom that did not receive such experience. The researchers' primary assumption of the procedure was that reasoning and argumentative skill develop through social interaction.

The participants were students and teachers from four public schools: two same-grade classrooms in each of two schools (A and B), with one school participating in CR discussions, and one classroom in each of two matched schools (C and D) with one school participating in CR discussions. Contrast classrooms participated in regular language arts instruction while CR classrooms participated in discussions. Two classrooms of fifth graders from School A participated, which was a rural public school of primarily European American families. Two classrooms of fourth graders from School B participated, which was a small-city school serving mainly middle-income families. One classroom of fifth graders from each of School C and D participated, which were small-city schools serving mostly African Americans from low-income families. A total of 115 students participated, 53 participated in CR discussions and 62 in contrast classrooms. The sexes were nearly equally represented. Six teachers participated as volunteers. CR teachers were trained in the CR model and received continuous coaching and support throughout the project.

Prior to CR discussion, students took a vocabulary test of 88 words and nonwords. Then, during the 5-week intervention period, students from CR classrooms met twice a week for 15 to 20 minutes in small groups of six to eight participants to discuss controversial issues in stories that provided the basis for discussions. At the end of the 5-week period, students from CR and contrast classrooms were asked to write a persuasive essay based on a story about a boy. A scenario and a writing prompt for the essay was given. For example, “Write whether or not you think Jack should tell on Thomas.” Essays were scored according to a coding system that measured students’ ability to consider a variety of relevant arguments, counterarguments, and rebuttals, as

well as their disposition to use textual information as evidence and to utilize certain formal argument devices.

Reznitskaya et al. (2001) found that fifth-grade students who participated in the CR discussions wrote essays that contained a significantly greater number of arguments, counterarguments, rebuttals, formal argument devices, and references to text information as evidence than did students in contrast classrooms who did not experience collaborative reasoning. Reznitskaya et al. also found that the reasoning skills students acquired in the collaborative reasoning discussions not only produced more argumentation-related comments in the classroom than found in a control classroom, but they also transferred to the writing of a persuasive essay about a new topic. Furthermore, classes were matched on ethnicity and socioeconomic status and there was no significant difference in vocabulary scores between CR and contrast classrooms. The results appear to be consistent with their hypothesis that participation in oral argumentation promotes individual reasoning skill.

Whereas fifth-graders who participated in the CR discussions wrote essays that contained a significantly greater number of arguments, counterarguments, rebuttals, formal argument devices, and evidence than did students in contrast classrooms who did not experience collaborative reasoning, fourth-graders did not show a significant difference in essay writing scores between CR and contrast groups. Thus, it appears that fourth graders who participated in CR discussions did not significantly enhance their argument schema in contrast to their peers who did not participate in CR discussions. However, fourth-grade students who did participate in CR discussions used more text-

based evidence versus appeals to personal intuition in their essays, but neither group gave consideration to an alternative position.

Reznitskaya et al. (2001) concluded that collaborative discussion appears to be an effective training ground for the development and internalization of generalized knowledge of argumentation (argument schema). “Our interpretation is that, through participation in CR discussions, students were able to internalize an argument schema, which in turn allowed them to construct a more complete argument. In other words, having an argument schema enabled students to consider and present more arguments, counterarguments, rebuttals, and formal argument devices” (p. 168).

Reznitskaya et al. (2001) refer to the concept of an argument schema to explain their findings such that an argument schema incorporates knowledge of the rhetorical structure of an argument, the inferential rules of reasoning, and other cognitive and social practices used in argumentation. Reznitskaya et al. explained that argument schemas are made up of structural and functional situations people have abstracted from their experience with argumentation. Thus, the richer and more extensive the experience the more refined and complete the schema. Reznitskaya et al. theorize that children’s CR experiences enhance their argument schema enabling them to better form an opinion, to better support it with reasons, to present and respond to counterarguments, and to use certain rhetorical forms.

Research that utilized Toulmin’s model (1958) as a heuristic for analyzing argumentative dialogue and composition suggests that most children in grades four through 10 are able to use at least the basic elements of Toulmin’s argument structure in argumentative discussions and persuasive compositions relative to issues in stories

(Anderson et al., 1997; Crammond, 1998; Reznitskaya et al., 2001). However, argument comprehension research that has utilized the Toulmin model (1958) as a heuristic for analyzing students' understanding of written argument has been less impressive. For example, research has revealed that recognizing written argument seems to be quite a bit less well-developed (Chambliss & Murphy, 2002; Golder & Coirier, 1994). Children may have knowledge of argumentative situations, but as far as recognizing argumentative text, children from the age of 10 through 16 may be relatively unfamiliar with the basic parts of an argument as well as more complex argument structures (Golder & Coirier, 1994).

Comprehending Written Argument

Golder and Coirier (1994) examined the comprehension of written argument among students aged 10 to 16 years, as part of their research in developmental trends in children's argumentative text writing. They hypothesized that the development with age of the argument writing process is linked to the writer's skills in the following three domains: (a) text composition skills, (b) mastery of the scripts (or rules) specific to situations of argumentation where arguing is appropriate, (c) the prototypical representation of argumentative text in stages starting with a nonargumentative stage where the speaker gives no supporting arguments (or may not even state a claim), and ending at an elaborate argumentative stage, where the speaker supports and negotiates statements using counterclaims and refutation. According to Golder and Coirier, children's representations of argumentative text should reflect this development. Whereas Golder and Coirier analyzed students' compositions and students' ability to recognize argumentative scripts and text, the latter is more pertinent to the present review of literature.

Golder and Coirier (1994) selected a total of 115 students to participate in this study from the following grades (and age groups): Grade five (10-11), Grade six (ages 11-12), Grade eight (ages 13-14), and Grade ten (ages 15-16). Golder and Coirier used an argumentative situation inference task to measure students' representation of the argumentative script. Students read a short dialogue between two people and were then asked to examine 15 target statements about the attitudes and behaviors of the conversers to determine whether what was said appears normal or abnormal on a particular converser's part. Analysis of the argumentative situation script revealed that 87% of the valid inferences were correctly recognized (84% at age 10 to 11, 88% at age 11 to 12, 87% at age 13 to 14, and 89% at age 15 to 16). These results indicated to Golder and Coirier that a script for argumentative situations is indeed acquired by age 10, but progress in this line continues between age 10 and 16.

Golder and Coirier (1994) then assessed "Argumentativity" or the "Prototypical representation of argumentative text" by determining whether or not students had a superstructural model of argumentative text. Students were asked to decide whether or not presented texts were argumentative or not. The texts were 3 to 4 sentences long and contained one of 6 degrees of argumentative text. At one end of the spectrum was "preargumentative text" with two degrees of argumentation: Degree 0 text made no claim and Degree 1 text made a claim. At the next level was "minimally argumentative text" where Degree 2 text made a claim and provided self-centered support while Degree 3 text made a claim and supported it with a nonself-centered argument. At the other end of the spectrum was "elaborate argumentative text" where Degree 4 text made a claim and supported it by a general argument plus one or more marks of restriction (e.g., many

people...this is not always true...sometimes...) while Degree 5 text stated a claim and supported it by a general argument plus a mark of speaker endorsement (e.g. I think, I feel, I believe). Students were asked to read 18 texts (3 of each degree) and classify them into one of three categories: truly argumentative (2), intermediate (1), and not argumentative (0).

For “preargumentative” Degree 0 and 1 texts, students recognized preargumentative text as argumentative. Students’ average argumentativity ratings for Degree 0 and 1 texts fell between 0.3 and 1.2 on a scale of 0 (nonargument) to 2 (truly argument). Golder and Coirier (1994) concluded that children have a naive, preargumentative representation based on an incomplete structure, such that stating one’s position suffices to argue for it. The perceived difference between argumentative and nonargumentative text was the greatest at age 15 or 16 and minimal at age 10 or 11. Eleven- and 12-year-olds appeared to be at an intermediate stage while 13- and 14-year-olds were similar to the 15-16 year-old age group (Golder & Coirier, 1994).

For “minimally argumentative” Degree 2 texts which contained a claim and self-centered support, the results revealed that students recognized text as argumentative significantly more than Degree 1 texts. Students’ average argumentativity ratings for Degree 2 texts fell between 1.4 and 1.6 on a scale of 0 (nonargument) to 2 (truly argument).

For “minimally argumentative” Degree 3 texts and “truly argumentative” Degree 4 and 5 texts, which were more elaborate argument, students’ ratings were similar to ratings for the Degree 2 texts on average. Students’ average argumentativity ratings for Degree 3, 4, and 5 texts fell between 1 and 1.5 on a scale of 0 to 2. There was even a

significant decrease in argumentativity ratings among the 10- to 14-year-olds when texts contained more elaborate argument structures. To Golder and Coirier (1994), a text was not considered argumentative unless the speaker exhibited certainty about the claim he or she had made. In other words, for most students and especially the younger ones, an argumentative text must express certainty, not negotiation consisting of counterarguments. Overall, Golder and Coirier concluded that elaborate argumentation is identified by 10- to 16-year-olds as uncertain, insufficient argumentation.

More current research in the comprehension of written argument revealed the same poor results among children and adults when using Toulmin's model (1958) as a heuristic for analysis (Chambliss, 1995; Chambliss & Murphy, 2002; Larson, Britt, & Larson, 2004). For example, Chambliss and Murphy (2002) found only a small proportion of accurate argument representations when fourth- and fifth-grade readers were asked to recall a passage which was written to argue. Chambliss and Murphy designed three texts with an argument structure taken from a textbook and a trade book on Maryland. The researchers incorporated three types of cues: a global discourse structure (argument), surface text structure (introductions, conclusions, and paragraph topic sentences), and content familiarity and vividness of details. Passages ranged from 595 words to 750 words. All three texts shared the same features: an argument structure including an explicit claim sentence, data to support the claim, and explicit warrant statements that linked the data to the claim. They also shared the same surface text structure. Each text began with an introductory paragraph that presented the claim. The body of each text presented five instances of data. Paragraphs began with a topic sentence

and ended with a sentence that stated the warrant. Each text concluded with a paragraph that summarized the entire argument. The final sentence in each text repeated the claim.

Chambliss and Murphy (2002) measured readers' text representations with a recall task that involved reading and writing down the author's main idea (claim) and details (supportive data). The researchers then used the three-part Toulmin (1958) model to specify the global discourse structure in both texts and readers' recalls. Chambliss and Murphy found that more children tended to represent text with a hierarchical structure, such as an argument structure or a topical net structure (Chambliss & Calfee, 1998), than a nonhierarchical structure, such as listing details. However, they were just as likely to represent the text with an argument structure as they were with a topical net structure. Chambliss and Murphy proposed that these representations suggest two types of text schemata, the argument schema and a topical net schema.

A closer analysis revealed that students' identification of argument structures was limited. Of the .68 hierarchical representations used to recall the author's written argument, only .08 were characterized as accurate argument representations suggesting use of a structure strategy (Chambliss & Murphy, 2002). Other hierarchical representations included inferred arguments (.14) which provided claims that were not exact statements or close paraphrases of the claim in the text, and topical nets (.46) for which general topics subsumed details. Nonhierarchical representations (.32) included listing details or nontext responses.

As a result, Chambliss and Murphy (2002) suggested a possible developmental sequence. This sequence extended from children representing argument as a list of details to children representing the accurate argument structure, with different levels of partial

representations including the topical representation in between. Within this framework, Chambliss and Murphy suggested four models of text processing: (a) the *structure strategy* (Meyer, 1985; Meyer, Brandt, & Bluth, 1980; Meyer & Freedle, 1984), (b) *macroprocessing* (Kintsch, 1998; Kintsch & van Dijk, 1978; van Dijk, 1980), (c) the *general topic strategy* (van Dijk, 1980), and (d) the default *list strategy* (Meyer, Brandt, & Bluth; 1980).

Overall, Chambliss and Murphy (2002) found that most children represented text with a main idea and supporting details in a hierarchical structure, such as the argument or topical net structure, than a nonhierarchical structure, such as listing details. Chambliss and Murphy characterized these children as using a *structure strategy* (Meyer, 1985; Meyer, Brandt, & Bluth, 1980; Meyer & Freedle, 1984). According to the structure strategy model, readers who use a structure strategy have knowledge of different rhetorical patterns used by authors to compose texts, such as argument, topical net, compare and contrast, and so forth. Accordingly, they search for cues and structural features in text to identify the author's pattern of organization and then match it to a text structure schema that they know (Meyer & Freedle, 1984).

Expert readers use text structure strategies to process text, by using the author's signals to identify the main idea and using the related text structure as a guide to plug in important information, thereby constructing a coherent representation of meaning. Extensive research has demonstrated the connection between expository text structure awareness, text structure strategy use, and comprehension (Chambliss & Calfee, 1998; Dymock, 1998; Englert & Hiebert, 1984; Meyer & Poon, 2001; Richgels, McGee, Lomax & Sheard, 1987; Taylor, 1985; Taylor & Samuels, 1983).

Whereas children in Chambliss and Murphy's (2002) study were just as likely to represent the text with an argument structure as they were with a topical net structure, the representations indicated that children used two types of text schemata to understand the author's ideas: the argument schema and a topical schema. Overall, Chambliss and Murphy demonstrated that some fourth graders and more fifth graders have an argument schema because they accurately produced the author's claim and support.

Likewise, Chambliss (1995) demonstrated that young adults use the structure strategy when reading argument text. It was evident from online protocols that these high school seniors who were good readers identified the argument structure after reading the claim and then searched the remainder of the text for cues signaling evidence that supported the claim. However, when students only had a schema for a simple argument, then they represented the main idea and supporting details as a simple argument in their written recalls rather than the more complex structure used by the author. Nevertheless, young adults who were competent readers used text cues as well as their argument schema to help them understand the author's ideas in written text (Chambliss, 1995).

Young adults who were competent readers used an argument schema to accurately represent the author's ideas, but only a small number of children performed as if they used an argument schema (Chambliss, 1995; Chambliss & Murphy, 2002). Some fourth graders and more fifth graders performed as if they had inferred the specific discourse topic or argument structure (Chambliss & Murphy, 2002). They produced a general statement that subsumed the details in their recalls, but the general statement was not a verbatim recall or a close paraphrase of the author's claim. According to Chambliss and Murphy, these students did not seem to recognize the stated claim in the text, but

inferred the author's claim from patterns in the text, thus the *macroprocessing* model (Kintsch, 1998; Kintsch & van Dijk, 1978; van Dijk, 1980). According to the macroprocessing model, readers rely on semantic structures in the text to infer a macrostructure that subsumes the text information, such as the main idea or gist of a text (Kintsch & van Dijk, 1978; van Dijk, 1980), or the author's rhetorical structure for a text (Chambliss & Murphy, 2002). In the case of argument text, the macrostructure would be the author's claim.

While some children used macroprocessing and the structure strategy to represent the author's pattern of ideas, many children accurately recalled the general discourse topic which is representative of all texts about the same topic (van Dijk, 1980) rather than the specific discourse topic (e.g., the author's claim in a particular text) and listed details that were subsumed by the general discourse topic rather than listing details in support of the author's claim in a particular text. Chambliss and Murphy (2002) referred to this type of processing as the *general topic strategy*. In addition, many fourth graders and some fifth graders performed as if they did not have a text schema that they could use to represent an argument text (structure strategy) and also could not infer a structure from patterns in the data (macroprocessing). These students listed details as both the author's claim and supporting data with no attempt to interrelate them. Thus, the fourth processing model—the default *list strategy* (Meyer, Brandt, & Bluth, 1980).

The differences among fourth and fifth graders' answers suggested to Chambliss and Murphy (2002) that children may become progressively more able to represent the specific structure in an argument. Fifth graders were more likely than fourth graders to represent an argument hierarchically and were more able to infer the claim of the text.

Whereas it is likely that sometime during the fifth grade some students become able to notice and use patterns in a text to infer a global structure, this developmental trend is only speculative beyond fifth grade (Chambliss & Murphy, 2002). On the other hand, the comprehension of argument among introductory level college students does not seem to differ all that much from children's level of argument comprehension development.

Larson, Britt, and Larson (2004) explored college student's argument comprehension of authentic argumentative essays. Seventy-six English-speaking students enrolled in an introductory-level college psychology class participated in the experiment. The researchers took excerpts from seven argumentative essays, six from argumentative textbooks and one experimenter designed. Each had one main claim and two to ten reasons in support of the claim. They varied in length from 103 - 732 words and had a Flesch-Kincaid grade level of 11.21. Participants read one of two versions: the explicit version, which contained marker or signal words, or the implicit version, which was the original version of the text.

The researchers used three measures. First, they measured reasoning skill using 18 questions from the Law School Administrations Test (LSAT). Second, they measured argumentative comprehension skill using a written task involving identification of author's main claim and underlining and numbering any reasons mentioned by the author to support that claim. And third, they asked students to rate their interest and skill level using a two-question survey.

Larson et al. (2004) found that overall argument identification accuracy was low among participating college students. Across all conditions, participants identified only an average of 12.92 argument elements of the 43 possible (30%). There was a main effect

of reasoning skill with students highly skilled in reasoning identifying more elements than participants less skilled in reasoning. There was also a main effect of marker explicitness. Those in the explicit condition found more reasons and claims.

When Larson et al. (2004) analyzed the content of errors made by participants; they found that the most common claim identification errors were non-controversial main thesis statements, such as general statements or questions on the controversy without taking a stance (37%). The next two most common errors were mistaking supported reasons (16%) and counterarguments (16%) as the main claim. Other errors included mistaking unsupported reasons (10%), backing (8%), or alternative claims (8%) as the main claim. In conclusion, Larson et al. noted that participants required support from either the author, as in discourse markings, or argument structure training.

The results from Experiment 1 suggested to Larson et al. (2004) that students needed remediation and may benefit from further instruction. They designed Experiment 2 which involved an argument tutorial using their analysis of student errors from Experiment 1 as a guide for the type of information that should be included. The argument tutorial provided direct instruction in argument comprehension which included the following: (a) defined key argument terms, (b) challenged common misconceptions about arguments, (c) explained a series of steps to comprehend written arguments, (d) provided modeling and practice, and (e) a ten minute practice task. Participants were randomly assigned to one of four conditions: the Argument Tutorial or No-feedback Practice condition and one of two Reading Goal conditions. Participants in the Comprehension condition were instructed to read for comprehension, and after each argument, they had to create one additional reason that supports this claim but was not

mentioned in the text. Participants in the Rebuttal condition were asked to critically evaluate the argument while reading. After each argument, they were asked to write down one reason to rebut one of the author's arguments. The experimenters then measured students' argument comprehension skills by asking students to identify the author's main claim and to underline and number any reasons mentioned by the author to support that claim.

The results indicated that accuracy was generally low (43%) but improved from Experiment 1 (Larson et al., 2004). Participants correctly identified an average of 12.13 of the 28 possible argument elements. There was a significant Training x Reading goal interaction. The Argument Tutorial for the Comprehension group identified more argument elements than the Argument Tutorial for the Rebuttal condition or either No Feedback group for Comprehension and for Rebuttal condition. Neither main effect of Training nor Reading Goal was significant.

These results indicated to Larson et al. (2004) that when participants focused on the single goal of comprehending the argument a short tutorial aided argument identification. Directions to evaluate while reading were not helpful and in fact removed the positive effect of the tutorial. Larson et al. concluded that instruction in the process of argument comprehension aided participants as long as they were not given the dual task of reading to evaluate and to rebut.

Larson et al. (2004) proposed several reasons for students' poor performance. According to Larson et al., "many arguments in real-life do not conform to the prescribed structure, and this may actually lead students to misunderstanding" (p. 220). For example, many authors do not state their claim in the first sentence or first paragraph which may

cause readers, who are unaware of this practice, to misperceive the author's actual claim. Larson et al. noticed in their sampling of arguments that authors commonly present and dismiss a counterargument before presenting the central argument. Larson et al. concluded that the claim- and reason-identification errors suggest that students may require more practice in understanding the connection between reasons and claims. According to Larson et al.'s results, students identified claims and reasons without verifying that the reasons actually supported their selected claim resulting in the lack of a coherent argument. Larson et al. suggested that maybe instruction in Toulmin's (1958) use of warrants for evaluating a claim may help students in comprehending a complete argument.

The results of research in argument comprehension seemed to indicate that many children and adults have a limited argument schema, relative to Toulmin's model (1958) of argument structures (1958), for recognizing and identifying the parts of a written argument (Chambliss & Murphy, 2001; Golder & Coirier, 1994; Larson et al., 2004). However, fifth grade students seem to do much better than fourth graders and more skilled college students seem to do much better than less skilled college students. It is likely that middle-school readers fall somewhere in between, but it is too risky to generalize findings from research involving children and adults to middle-school readers. Research in argument comprehension utilizing Toulmin's model with middle-school students could begin to fill the gap in our understanding of what early adolescents know about argument structures. Likewise, it would be most illuminating to compare their argument comprehension efforts against an existing model of argument comprehension that is based on Toulmin's model and is available in the literature.

A Model of Argument Comprehension. Chambliss (1995) devised an argument comprehension model based on Toulmin's (1958) model of argument and Meyer's (1985) work in rhetorical structures, or schemata, that authors use to organize ideas in text. There are three stages to the model: (a) recognizing the argument, (b) identifying the claim and evidence, and (c) constructing an argument representation. In stage one, as soon as good readers notice a claim and evidence in the text they use an argument schema to identify the text as argument. In stage two, good readers search for and identify the claim and evidence in the text distinguishing between evidence and nonevidence. In the third stage, successful readers construct a mental representation of the author's argument that is consistent with the author's rhetorical pattern and linking the warrant to the claim and evidence. Figure 1 depicts the stages in graphic form.

Each stage of the model is supported by Chambliss' work (1995) with good readers representing the gist of lengthy argument. Stage one is supported by the results of Experiment 1 involving 71 high school seniors in AP English from a middle class suburban community, 50% of whom were minority students and eight of which were verbal protocol students (Chambliss, 1995). Chambliss showed that text structure was the one text characteristic consistently influencing how readers responded. When readers recognized the claim/evidence structure in the passage, they would identify it as argument, but when it was missing, readers identified the text as informational.

Stage two is supported by the results of Experiment 2, which involved 68 high school seniors in AP English from the same middle class suburban community, 50% of whom were minority students and eight of which were verbal protocol students (Chambliss, 1995). Chambliss demonstrated that good readers tend to use three strategies

to identify an argument's claim and evidence. First, they find the claim in the text and use it to distinguish between evidence and nonevidence. Second, if they fail to find the claim, readers may use one of two alternate strategies. They may induce the claim from the introduction and evidence presented in following paragraphs or they may identify all facts and examples as evidence and search for a general claim that subsumes the evidence presented.

Stage 1: Recognizing the author's purpose to argue.



Stage 2: Identifying the parts of the argument,
(e.g., claim and evidence).



Stage 3: Constructing an argument representation
of the author's message.

Figure 1. Three stages of argument comprehension (Chambliss, 1995).

Stage three is supported by Chambliss' (1995) Experiment 3, which involved 57 high school seniors in AP English from the same middle class suburban community, 50% of whom were minority students and six of which were verbal protocol students.

Chambliss found that the mean for complex arguments was higher than for simple arguments, indicating that more readers organized their recalls of a complex argument with a complex structure, thus, using the author's structure in their summary.

The reviewed research has showed us that the Toulmin model is a useful heuristic for analyzing various types of argumentative discourse. As a result, we have learned that children as young as fourth grade can use argument structure to express themselves in

discussions, in their written compositions, and when comprehending what they read. To what extent argument structure, or argument schema, is developed among young arguers varies with the particular discourse undertaken. Most children in fourth and fifth grade appear to develop an argument schema through argumentative dialogue and can transfer this knowledge to written persuasive essays (Reznitskaya et al., 2001). However, Golder and Coirier (1994) concluded that children have a naive, preargumentative representation based on an incomplete structure, such that stating one's position suffices to argue for it, but progress along this line continues with the greatest ability to discriminate levels of argument at age 15 or 16.

Likewise, Chambliss and Murphy (2002) found that fourth and fifth graders were very limited in their use of argument structure to accurately identify the parts of an author's written argument, but fifth graders did better than fourth graders. Likewise, introductory level college students were very limited in their use of argument structure to accurately identify the parts of an author's written argument, but they improved somewhat after a short tutorial in argument structure (Larson et al., 2004). In contrast, high-school seniors that were competent readers successfully used an argument schema to identify and represent the author's message in argument text (Chambliss, 1995). How middle-school students identify persuasive text and the parts of an author's written argument or represent the author's message is not illustrated in the argument comprehension research. To infer possibilities regarding how middle-school readers comprehend argument from work done with younger or older students seems risky. Such is the case regarding argument evaluation among middle-school readers.

Research from the field of argumentative thinking has helped us to understand how well people think and reason in everyday situations as well as in scientific scenarios. This body of research focuses on how people evaluate evidence before making a judgment. It mostly involves the analysis of participant-generated arguments regarding a stated premise or issue for the purpose of analyzing argumentation skill. This research illustrates how children evaluate evidence and form judgments. While this research does not illustrate how young readers evaluate written argument, it does elaborate for us how well they think in terms of argument structure and what other factors play into argumentative reasoning.

Development in Argumentative Thinking and Argument Evaluation

In a series of studies, Stein and Miller (1991) focused on the understanding of and the reasoning associated with interactive arguments among second graders, sixth graders, and college students. Students were first interviewed to determine the most familiar and interesting argument topic (i.e., a conditional promise). Two narratives were then constructed simulating an argument between two participants concerning a promise made, one stating the conditions for the promise explicitly (e.g., “if the game was cancelled, then the promise would be off and they would not have to help each other”) and one not stating the conditions at all. At the end of the narrative, students find out that it rains and the game is cancelled. Then, two claims are stated. Dan’s claim was that they do not have to help each other. Sarah’s claim was that they still have to help each other. After hearing the story with either the implicit or explicit statement of the promise, all subjects had to decide which side of the argument they would support: helping or not

helping, and give reasons for supporting their position. Students also had to generate arguments for the opposing side of the argument.

Stein and Miller (1991) found that both groups of children in the implicit condition consistently supported the position of continuing to help each other despite the cancellation of the game while adults consistently supported the position of not helping. Children from both age groups seemed to believe that the promise was in and of itself sufficient to demand that it be kept, whether they would be able to go to the game or not.

In the explicit condition, there were developmental differences between second graders and sixth graders. For instance, second grade children were more likely to hold to their initial belief (e.g., a promise was unconditional) than sixth-grade children regardless of the conditions, even after they were reminded of the condition and the fact that the game was cancelled. Second-graders seemed resistant to accepting the conditional nature of the promise. In other words, the act of promising to do something was seen as independent of the reason for promising to do it. The fact that the promise was made was sufficient reason for keeping it. In contrast, sixth graders in the explicit condition showed more variability in their reasoning and a greater tendency to use both types of reasoning (e.g., promise obligates, promise is conditional) to defend their positions. Overall, their decision paralleled the adult's in that most of them supported the position to not help (Stein & Miller, 1991).

Stein and Miller (1991) argued that if children really believe that promises are unconditional, then the presence of an explicit agreement to the contrary may not be seen as relevant when choosing their position and selecting evidence to support it. Stein and Miller (1993) found that more than 75% of all participants, who were second- and sixth-

graders as well as undergraduate and graduate students, maintained their initial position over three tasks indicating their commitment to a position with very little room for changing their minds.

Adults, on the other hand, favored evidence based on the contractual nature of the promise. According to Stein and Miller (1991), this developmental difference in decision making is the result of a difference in social norms used as criteria for evaluation. If the social norm among children emphasizes consequences to the individuals involved in breaking a promise, then the second grade participants fully understood the conditional aspects of the promise and in maintaining their belief achieved their goal in maintaining fairness for all and avoiding negative social consequences. In contrast, the social norms followed by adults observed an informal contract law which specifies voiding the promise under certain circumstances, conditional knowledge from which they reasoned.

Nickerson (1991) described this phenomenon as “case building,” or the selective use of evidence that supports one’s conclusion and the discounting of evidence that does not support one’s conclusion. Similarly, Lord et al. (1979) and Slater (1998) described this phenomenon as biased assimilation. Lord et al. demonstrated that adults who have strong beliefs on an issue rated evidence as more convincing when it confirmed their own beliefs. Likewise, Slater built on and extended the work of Lord et al. and demonstrated that 11th grade students with strong initial beliefs were more likely to demonstrate biased assimilation in written conclusions.

Stein and Miller (1993) and Slater (1998) explained this phenomenon of biased assimilation in terms of schema theory (Anderson, 1984; Anderson & Pichert, 1978; Bartlett, 1932) where the interpretation of new information depends heavily on the

reader's prior beliefs or background knowledge. Based on schema theory, Stein and Miller (1991; 1993) hypothesized that background knowledge and beliefs control people's argument representations, how they will evaluate and be influenced by the evidence. Thus, Stein and Miller argued that if prior beliefs or knowledge are regulating the support for a particular position, then taking a stance in an argument and bringing evidence to bear on that position is a function of knowledge and beliefs about the domain of the argument, rather than a matter of development in argumentative skill (Stein & Miller, 1991, 1993).

Thus, what participants know about the content, structure, and functions of argument, in general, and about the domains relevant to a given argument, in particular, becomes an important concern in the analysis of argumentation skill (Stein & Miller, 1991, 1993). Several researchers have extended research in this line by exploring the impact of beliefs and domain knowledge on the persuasion process (Alexander et al., 2001; Alexander et al., 1998; Buehl et al., 2001). These studies are reviewed in detail in the section titled, *The Influence of Persuasion on the Critical Reading of Argument*

Other research within the realm of argumentative thinking and reasoning explored individual differences in the ability to evaluate the quality of an argument among adults. Stanovich and West (1997) explored cognitive capacity and thinking dispositions most relevant to rational thought. They asked 349 college students to complete three measures. The Argument Evaluation Test measured participants degree of agreement with a series of propositions (part 1) and strength of rebuttals (part 2). SAT scores indicated general ability. The Thinking Dispositions Questionnaire measured flexible thinking, openness to ideas, openness to values, absolutism, dogmatism, categorical thinking, superstitious

thinking, counterfactual thinking, and social desirability response bias. Stanovich and West then conducted 349 multiple regression analyses (one for each participant) to arrive at two beta weights: one for argument quality and one for prior belief. According to the researchers, the beta weight for argument quality is the primary indicator of the ability to evaluate arguments independent of one's beliefs.

Stanovich and West found that beta weights varied widely, which suggested that individuals vary substantially in their reliance on argument quality and prior belief when evaluating the arguments. But, when Stanovich and West explored the differences between two profile groups, a high argument quality group (HIARG) and a low argument quality group (LOARG), significant differences were revealed. The HIARG group relied more on argument quality for their argument evaluation decisions, whereas the LOARG group relied more on their prior beliefs about the issue when making argument evaluation decisions. The mean SAT total scores were significantly higher for the HIARG group than for the LOARG group, indicating that participants who relied more on argument quality than prior beliefs were higher in cognitive ability.

Relative to the Thinking Dispositions Questionnaire results, HIARG participants consistently displayed more open-mindedness, cognitive flexibility, and skepticism, and less dogmatism and cognitive rigidity. As a result of a series of hierarchical regression analyses, Stanovich and West found that differences in thinking dispositions were a function of cognitive ability differences, but that the link between thinking dispositions and argument evaluation was not entirely due to covariance with cognitive ability. Thus, various measures of thinking disposition are predictors of argument evaluation ability,

independent of cognitive ability. These thinking dispositions include flexible thinking, openness to ideas and values, and counterfactual thinking.

Still other research within the realm of argumentative thinking and reasoning demonstrated how children, adolescents, and adults evaluate evidence relative to beliefs (Kuhn, 1992; Kuhn, Amsel, & O'Loughlin, 1988). In Kuhn, Amsel and O'Loughlin's (1988) series of studies, the focus was on how participants coordinate theory and evidence (i.e., evaluate how evidence bears on a theory or belief). Participants were 20 fifth- and sixth-graders from a mixed classroom and 20 ninth-graders from a school in a lower-middle-class urban school system. A group of 20 high-school graduates, age range 19-60, with a median age of 29 participated who were personal contacts of the interviewers. An additional five adults who were advanced-level candidates for the Ph.D. degree were included as a separate group referred to as the philosophers.

Participants were presented with a problem concerning a study some scientists had been conducting on how children's diets affect their susceptibility to colds. Participants were asked to rate the foods the scientists studied on a scale of -8 to +8 as making a difference and then participants were asked to explain their ratings for each of the variables selected. By asking the question "Why do you think that (variable) makes/doesn't make a difference?" students described the causal or noncausal theories underlying their ratings.

Next, participants were provided with information concerning students at some lunch tables having lots of colds and students at other tables having very few colds. Evidence (food and drink) was arranged in different patterns of covariation with each other and with outcome and students were asked if the kind of food children ate made a

difference in whether they get lots of colds or very few colds. Then the students were asked how they knew that the kind of food does/doesn't make a difference.

Kuhn et al. (1988) were initially interested in whether or not students spontaneously considered evidence. However, the researchers also examined whether or not participants would consider evidence when explicitly directed to do so. If participants responded to the "how do you know the kind of food does/doesn't make a difference" question with evidence, it was followed by a certainty-based probe (Do the scientist's findings tell you for sure that this food does/doesn't make a difference?). If participants responded to the "how do you know" question with theory (i.e., beliefs, feelings, experiences, or background knowledge) their response was followed by an evidence-based probe designed to direct the subject's attention to the presented evidence and to make it explicit that the response should be based on this evidence. For example, the interviewers asked the question "...do the findings of the scientists show that the kind of food does make a difference, doesn't make a difference, or can't you tell what the scientists findings show?" to direct participants' attention to the evidence.

Kuhn et al. (1988) examined 32 overall evidence evaluation responses for evidence of whether or not students were able to coordinate theory and evidence (i.e., evaluate newly presented evidence that bears on an existing theory). According to the researchers, evidence-based responses to the initial or the evidence-focus probe would have indicated their ability to do so. The mean frequency of spontaneous evidence-based responses out of 16 possible instances by age group to covariation and noncovariation evidence respectively were 4.85 and 4.95 for sixth graders, 7.95 and 8.10 for ninth graders, 8.05 and 9.6 for adults, and 10.2 and 12.0 for philosophers. Mean frequencies of

spontaneous or elicited evidence-based responses by age group for covariation evidence and noncovariation evidence, respectively were 10.35 and 9.75 for sixth graders, 12.3 and 12.25 for ninth graders, 13.30 and 12.85 for adults, and 16.0 and 16.0 for philosophers. For both spontaneous and elicited responses, there was a significant increase in the frequency of evidence-based responses among grade levels with sixth-graders' spontaneous responses being significantly lower than ninth graders' and adults', who did not differ.

Kuhn et al. (1988) interpreted these results to mean that sixth graders showed very limited ability in evaluating evidence that bears on a theory, even when explicitly instructed to do so. Sixth graders showed a predominance of theory-based responses that vacillated between theory-based and evidence-based responses, suggesting some confusion or lack of differentiation between theory and evidence. Overall, sixth-graders did not make good use of the evidence in justifying their inferences, however, the ability to evaluate evidence increased modestly between sixth and ninth grade.

In the second of a series of studies, Kuhn et al. (1988) examined the extent to which background knowledge and prior beliefs regarding a theory made it more difficult for participants to see the relation between a given set of evidence and theory. Participants were 20 third, 20 sixth, and 20 ninth grade students from an urban public school system, 20 adults predominantly in their 20s, and 20 graduate students in education. Kuhn et al. examined the results on two different problems abbreviated from the initial study, one that minimized background knowledge and beliefs and one that did not. Participants were presented with a problem concerning scientists trying to figure out how to make the best stain remover, which was intended to minimize background

knowledge. Participants were then presented with a problem that took advantage of students' background knowledge concerning the best way to take care of house plants, which included different forms of water, food and supplements. Participants were asked whether or not certain variables made a difference to stain removal for the first problem and in plant health for the second problem. Probes to elicit their reasoning were eliminated for the purposes of Study 2.

Kuhn et al. (1988) found that minimizing the influence of prior knowledge and beliefs did not serve to eliminate theory-based responding. The effect varied by age group with the youngest group showing a prevalence of theory-based responses unaffected by problem type, an average of 60% versus 56% in the plant and stains problems respectively, compared to the graduate student group which showed virtually no theory-based responding on either problem. The middle three groups, sixth graders, ninth graders, and 20-year-olds, in contrast, gave more theory-based responses on the plant problem than on the stain removal problem: 45% versus 33% among sixth graders, 26% versus 13% among ninth graders, and 39% versus 0% among adults, respectively.

Overall effects of age were consistent with those found in the initial study with a significant difference between sixth and ninth graders and between nonacademic adults and graduate students for each problem with no sex differences present. Whereas third graders consistently relied on their theories in either problem, the graduate students focused on the evidence in both problems. The middle groups appeared to be less able to evaluate newly presented evidence when they had increased prior knowledge that would explain the theory, but the lack of evidence-based responses was not confined to the plant case.

Students' failure to make evidence-based responses occurred more frequently in cases where the evidence disconfirmed theory across both problems. Kuhn et al. (1988) interpreted these findings to mean that theories affect one's disposition to evaluate evidence. In other words, children and adults may resist acknowledging and interpreting evidence if it conflicts with their theoretical beliefs. They tend to disregard the evidence and base a response instead on their own theoretical views.

Moreover, Kuhn et al. (1988) found that sixth graders appeared to have the competence to explicitly evaluate the bearing of evidence on a theory but did not always weigh evidence correctly. For instance, approximately one-half to two-thirds of sixth graders made evidence-based responses showing that they had the ability to examine the evidence at some level of awareness in order to respond with supporting evidence. That sixth graders did not necessarily evaluate this evidence correctly but selectively shows us that there is a gap between performance and competence. Reasons point to the possible influence of prior beliefs on evidence weighing when faced with conflicting evidence and theoretical beliefs (Kuhn et al., 1988).

Kuhn et al. (1988) further illustrated how theoretical beliefs appear to influence participants' evaluation of evidence unconsciously by examining a subset of participants selected from the original study. Kuhn et al. hypothesized that participants would be more likely to evaluate the evidence and make evidence-based responses if the evidence is consistent with or covaries with the participants' prior theory and less likely to do so if the evidence is inconsistent, or does not covary, with the theory. They also hypothesized that identical evidence would be interpreted differently as a function of its consistency with prior theory, thereby indicating bias in participants' interpretations.

Kuhn et al.'s (1988) analysis revealed a significant increase in the mean number of evidence-based responses when evidence was consistent with theory, i.e., evidence covaried with theory, than when evidence was inconsistent with theory. The researchers also found support for hypothesis two, that identical evidence would be interpreted differently as a function of its consistency with theory. Overall, 42% of participants exhibited bias in their interpretation of covariation evidence, which decreased only slightly with age: 47% for sixth graders, 41% for ninth graders, and 35% for adults. Overall, 52% of participants exhibited bias in their interpretation of noncovariation evidence, a slightly higher proportion than showed such bias in the interpretation of covariation evidence. Moreover, this percentage did not decline with age: percentages by age group were 48% for sixth graders, 55% for ninth graders, and 56% for adults. Male and female participants were equally likely to exhibit bias.

Kuhn et al. (1988) explained that even a discrepancy between theory and evidence did not lead participants to any clearer differentiation between theory and evidence. When theory and evidence were not compatible, they used the same strategies to bring them into alignment as they used with discrepant evidence. Individual protocols revealed that in their attempts to reduce the inconsistency between theory and evidence, participants either adjusted the theory or adjusted the evidence by ignoring it, attending to it in a selective, distorting manner, or failing to acknowledge its implications. More notable to the researchers was that participants had to have theory and evidence in alignment rather than acknowledge the discrepancy between theory and evidence.

Results of a group analysis suggested that younger participants showed limitations in their differentiation of theory and evidence. For younger participants, theory and

evidence seemed to “fit together into a consistent representation” with little distinction between their roles. Overall, only two participants acknowledged the discrepancy between theory and evidence and distinguished between theory and evidence. These participants interpreted the evidence while the rest either ignored the evidence and reiterated their theory or used biased evaluation of evidence.

Kuhn et al. (1988) interpreted the results to represent how theory influences the evaluation of evidence in ways that appear to be outside the conscious control of the participant. When theory and evidence were compatible, participants seemed to join the two into a single representation of “the way things are.” These participants considered the different pieces of evidence as examples of the theory and these examples served to illustrate the theory. Likewise, to participants, the theory was capable of explaining the evidence. Therefore, articulating the theory seemed to be just as good as analyzing the nature of the evidence itself.

Kuhn et al. (1988) concluded that these students lacked evidence evaluation skills. First, they lacked the ability to encode and represent evidence and theory as separate entities. Second, they lacked the ability to think about a theory rather than with a theory and thus lacked the ability to evaluate the bearing of evidence upon theory. Third, they lacked the ability to temporarily set aside their acceptance of a theory in order to evaluate how the evidence relates to the theory. To Kuhn et al., the ability to temporarily set aside one’s belief in a theory and to regard it as an object of cognition enables one to “assess the relation of the evidence to it and thereby effect conscious control over the interaction of theory and evidence” (p. 91).

In another of their series of studies, Kuhn et al. (1988) examined the influence of belief or theory strength in coordinating theory and evidence. The researchers questioned whether or not participants with strong beliefs would still adjust their theories as a means of reconciling discrepant evidence with theories or resort to another strategy, such as adjusting evidence. Participants were 30 third graders, 30 sixth graders, 30 ninth graders, and 30 young adults. The researchers first established the strength of participants' theories in relation to a new game study concerning different kinds of balls to use in a game that involved hitting a ball across a net to an opponent. Participants were presented with a box of balls of different textures, sizes, colors, and absence or presence of ridges. Participants were then asked which variables might make a difference in the game and two were selected for evaluation, the one that made the most difference and the one that made the least difference. The researchers then elicited participants' evaluation of evidence by placing certain balls in the "good serve" basket and/or the "bad serve" basket as evidence, and then asking participants the questions, "Do these results help more to show that one person [Mr. Size, Mr. Texture, Mr. Color, or Mr. Ridges] is right...? Why? Do these results prove that Mr...is right? Why? What do these results have to say about Mr... 's view? Why?"

Overall, virtually all participants maintained their theory and instead adjusted evidence in a biased manner in order to reconcile their theories with the evidence. For example, one young adult theorized that texture (Mr. T) was causal with rough balls yielding good serves and that ridges were noncausal. However, when balls were arranged in identical associations between texture and ridges and outcome, the participant applied two different inference strategies to identical evidence in a way that served his theoretical

beliefs. When he observed balls with texture in both baskets, he supported his theory with the fact that more smooth balls than textured balls had bad serves. When he was asked what the results have to say about Mr. R's view, he said that it shows "nothing about ridges...because you have balls that have ridges that have bad serves and balls that have ridges that have good serves." This participant exhibited a common strategy that served to bring theory and evidence into alignment with one another (Kuhn, 1992).

Third graders were more similar to sixth graders than to any other age group, but they made more theory-based responses and showed biased evaluation of evidence more frequently than did sixth graders. To Kuhn et al. (1988), the results suggested that not just the theory itself but the strength or certainty of participants' theories will influence the manner in which evidence is evaluated. For example, adjusting theory to reconcile theories and discrepant evidence becomes less likely when one's theories are stronger. In other words, a weakly held belief is more likely to be influenced by new information than are strongly held ones.

Children in Kuhn et al.'s (1988) series of studies did not weigh evidence against theory. Instead they either failed to acknowledge discrepant evidence or attended to it in a selective, distorting manner. Although ninth graders' and adults' evidence weighing approached that of philosophers', Kuhn et al. found a significant difference between evidence weighing in educated and noneducated adults. Similarly, in Kuhn's (1991, 1992) studies of everyday thinking, Kuhn found that adolescents through adults did not evaluate evidence. Kuhn (1991, 1992) explored the thinking underlying people's beliefs and opinions from adolescents to adults in both the college-educated and noncollege-educated. Participants were 160 ninth graders from four city high schools, young adults

in their early twenties, middle-aged adults in their forties, and older adults in their sixties. Both college-educated adults, and in the case of high school students, prospective college students, and noncollege educated adults were selected to participate. To investigate, Kuhn asked people their opinions and causal theories on three topics: (a) What causes prisoners to return to crime after they are released? (b) What causes children to fail in school? and (c) What causes unemployment? Interview teams asked participants for evidence to support their theories, and then probed those regarding alternative theories, counterarguments, and rebuttals.

With respect to evidence used to justify theories, Kuhn (1991, 1992) found that from one-half to three-quarters of participants claimed that they were sure or very sure that their theories were correct across topics. When asked “How do you know that this is the cause?” 40% responded with “genuine evidence” that was differentiated from the theory and supported the theory’s correctness, however, evidence was minimal and of a personalized nature. Those that did not offer genuine evidence offered narrative derived from personal experience, but which was not separate from the causal theory and the evidence provided. This indicated to Kuhn that participants did not clearly differentiate between theory and evidence (Kuhn, 1991, 1992). Consequently, Kuhn described their epistemology as uncritical.

With respect to generating alternative theories, when asked, “A person whose view is different from yours—what might they say is the cause?” some participants offered an alternative theory without difficulty. Some participants declined. On average across topics, the percentage of participants able to generate alternative theories was about 60%. According to Kuhn (1991, 1992), subjects who generated neither genuine

evidence nor alternative theories took their theories for granted as statements about the way the world is. They did not reflect on their theories as objects of cognition—as claims needing to be evaluated in the light of alternatives, as well as evidence. “To truly evaluate a theory, one must not only reflect on it as an object of cognition, but reflect on it relative to its alternatives. Only by considering alternatives—by seeking to identify what is not—can one begin to achieve any certainty about what is” p. 164).

In her investigation of counterarguments, Kuhn (1991, 1992) asked participants “what could someone say to show that you were wrong?” and that success rate was about 50%. In her analysis of unsuccessful responses, Kuhn found that the most common error was to not present an argument against the original causal theory. Instead, participants addressed why the cause exists, offered alternative theories, or stated that no counterarguments could exist. Success rate for rebuttals was much lower. Only 25% of participants could correctly respond with a rebuttal when asked the question “What could you say to show that this other person was wrong?” Participants either provided counterargument to an alternative theory or declined to give a rebuttal.

With respect to evaluating written evidence, Kuhn (1991, 1992) presented participants with both underdetermined evidence and overdetermined evidence that supported a cause or claim related to the crime topic, without favoring any of them. As a result, participants commonly assimilated both kinds of evidence to their own theories and expressed certainty regarding these judgments. It appears from Kuhn’s data that adolescents through adults engage in biased evidence weighing, or what Nickerson (1991) termed “case building.” But to Kuhn, the biased evidence weighing she observed happened outside of one’s metacognitive awareness and control. Overall, only 15% fell

into the evaluative epistemological category, in which knowing is regarded as a process that involves thinking, evaluation, and argument. To Kuhn (1992), this “epistemological naivete” may be one reason participants displayed such limited argumentative reasoning ability.

A Model of Argumentative Thinking and Reasoning

As a result of her work, Kuhn (1989, 1991, 1992; Kuhn et al., 1988) argued that thinking well “requires thinking about theories or beliefs rather than merely thinking with them, and thinking about evidence rather than merely being influenced by it. This development is thus metacognitive, as well as strategic” (p.688). Having the knowledge of argument structure (i.e., a mental representation of the theory separate from the evidence) is fundamental to argumentative thinking, but Kuhn’s work demonstrated that metacognitive awareness and control is essential in the process, otherwise one’s prior beliefs may bias their evaluation of evidence. According to Kuhn (1989), the minimum skills needed to evaluate evidence that bears on theory include the ability to: (a) identify the evidence and represent it separately from a representation of the theory, (b) think about the theory itself rather than to simply think with it, and (c) temporarily set aside one’s acceptance of the theory, in order to evaluate the evidence and its bearing on the theory.

Kuhn (1989, 1991, 1992) depicted the differences between the process of argumentative thinking in children, lay adults, and experts in a developmental framework devised from her work in scientific thinking and everyday reasoning. Figure 2 graphically represents this developmental framework as a continuum of argumentative skill.

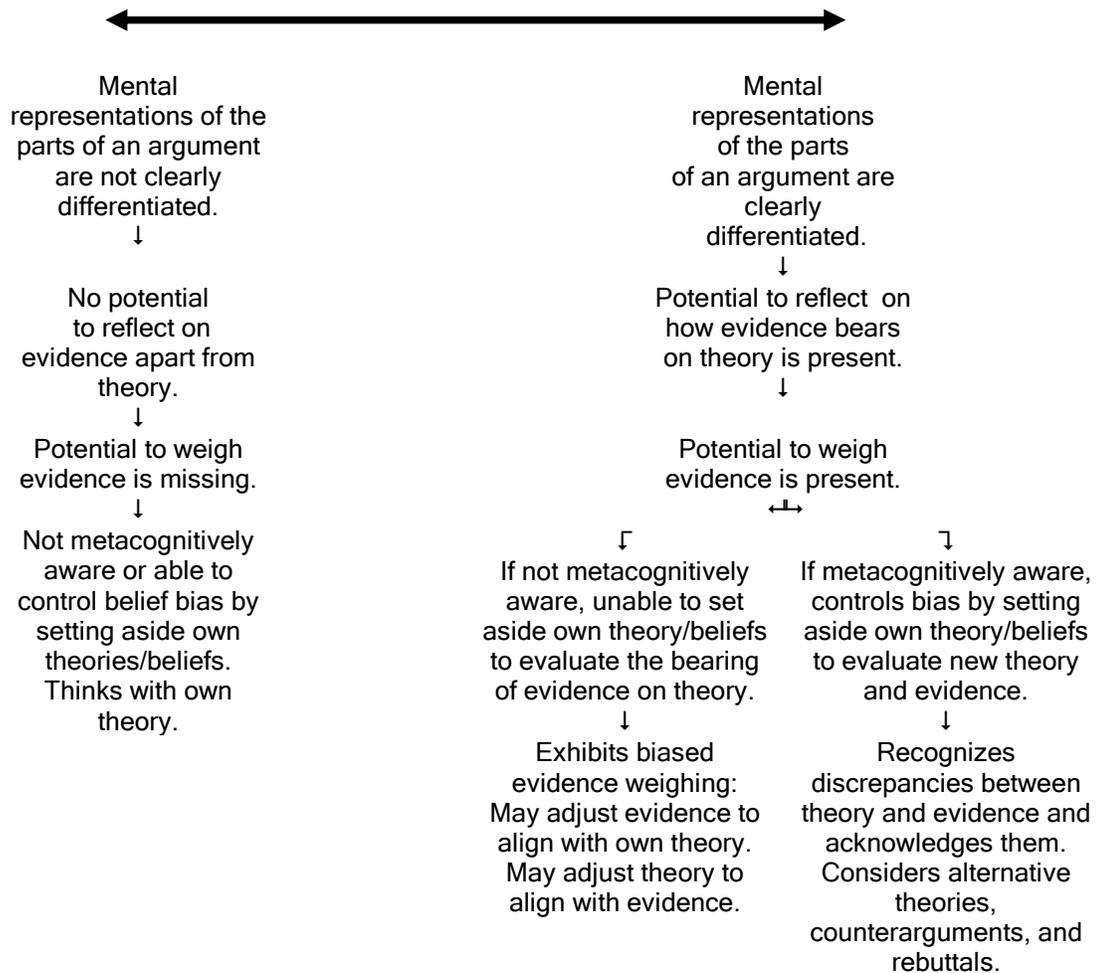


Figure 2. Developmental continuum in argumentative thinking (Kuhn, 1989).

At the lower end of the developmental continuum, mental representations of evidence are not differentiated from theory (i.e., are not separate objects of cognition) thus no construction of relations between the two is possible and evidence weighing does not exist. At the other end of the continuum, mental representations of evidence are differentiated from theory and can therefore be acted on and evaluated relative to mental representations of alternative theories. Kuhn’s work revealed that young children and

many adolescents and adults who exhibited characteristics from the lower end of the developmental continuum did not sufficiently differentiate the evidence from the theory itself (Kuhn, 1989, 1991, 1992; Kuhn et al., 1988).

As a result, young children, many adolescents, and some adults do not hold in memory separate mental representations for the parts of an argument that they can act on and evaluate like experts do (Kuhn 1989, 1991, 1992; Kuhn et al., 1988). When theory and evidence were compatible, children and many adolescents and adults joined the two into a single representation of “the way things are.” There was no concept of evidence as standing apart from the theory and bearing on it. In addition, children through adults adjusted evidence to fit their theories by ignoring it or attending to it in a selective, distorting manner. When theory and evidence were discrepant, it appeared that children and many adults attempted to maintain alignment between the two by adjusting their theory to reduce its inconsistency with evidence. Kuhn (1989) concluded that although participants were aware enough to recognize discrepancies between theories and evidence, the “metacognitive capacity is not great enough to firmly maintain the differentiation between what derives from one’s own thought and what derives from external sources (p. 681).” Thus, argumentative thinking requires knowledge of argument structure as well as reflection on one’s own theories relative to evidence and alternatives (Kuhn, 1991).

A Model of Critical Reading

Taken together, Chambliss’ (1995) model of argument comprehension and Kuhn’s (1989) continuum of argumentative thinking provide us with a model of critical

reading relative to argument text. Figure 3 graphically illustrates this model of critical reading.

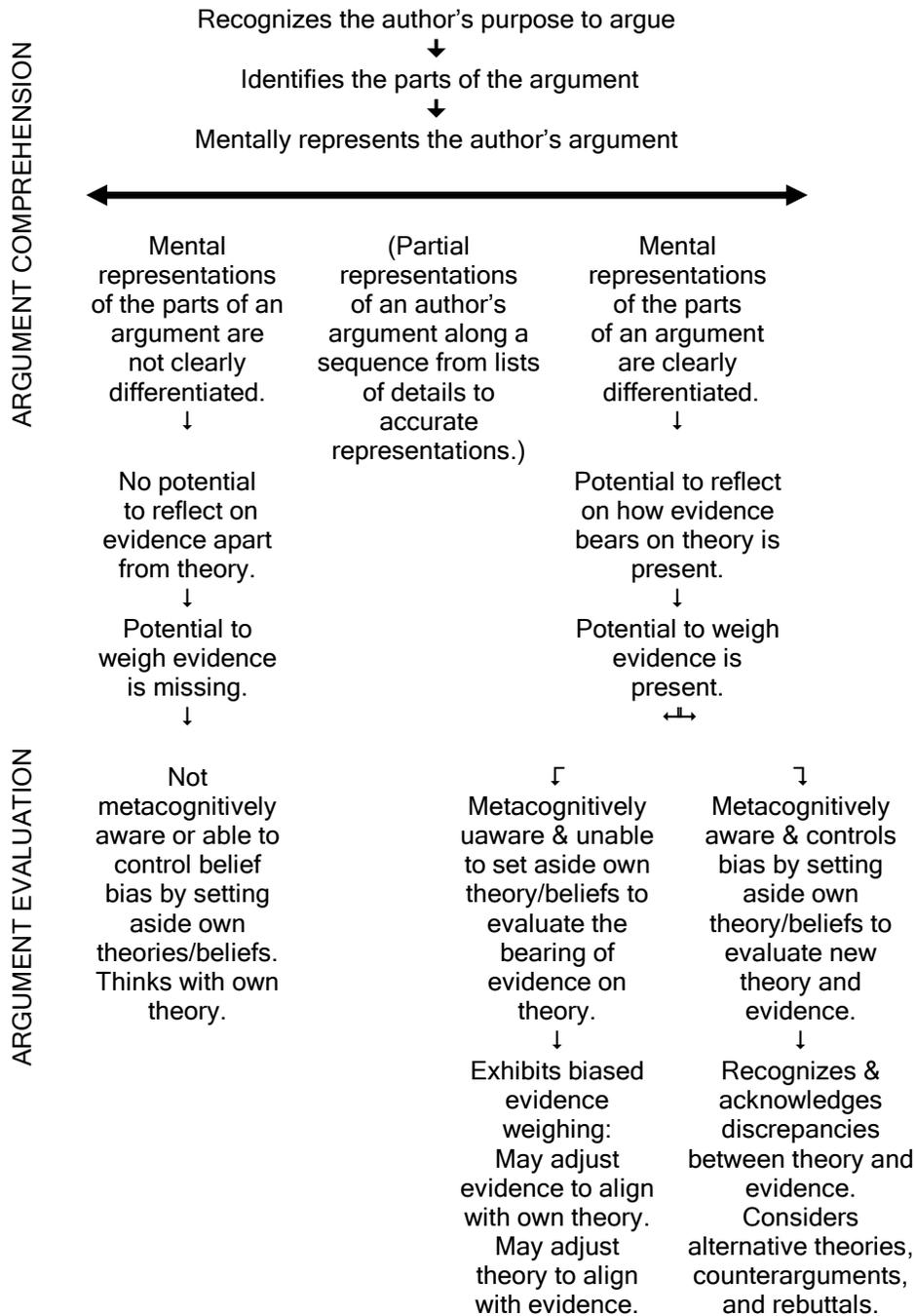


Figure 3. A developmental model of critical reading (Chambliss, 1995; Chambliss & Murphy, 2002; Kuhn, 1989).

When readers encounter text that is written to argue, they either recognize the rhetorical structure in the text and move to identify the parts of the argument or they infer the rhetorical structure from reoccurring concepts in the text. In doing so, they mentally represent the author's message somewhere along a sequence of representations from a list of details to partial representations to a complete mental representation of the author's argument (Chambliss, 1995; Chambliss & Murphy, 2002). Competent readers distinguish more clearly between the parts of an argument than do typical readers. With regard to evaluating the author's message, the extent to which they mentally represent the parts of an argument clearly influences the extent to which evidence can be weighed (Kuhn, 1989).

Kuhn (1989, 1991, 1992) concluded that younger participants (third graders) do not exercise control over their thinking as they interpret evidence and revise theories but allow belief bias to affect their evidence weighing unaware that they are doing so. Whereas children have weak metacognitive skills, Kuhn determined that adolescents (ninth graders) and adults do much better. Many can differentiate between theories and evidence, and can reflect on how the two bear on one another.

It was especially significant to Kuhn (1992) that the variation one would expect between early adolescence (sixth graders) and early adulthood (ninth graders) did not exist while most variation existed among college-bound and noncollege-bound adolescents (Kuhn, 1992). In fact, Kuhn's (1992) results indicated that argumentative reasoning ability does not differ systematically as a function of sex or age but is strongly related to education level. Further research investigating middle-school students' online evaluating skills could help to illustrate developmental differences between grades six

and nine and explain why there appears to be little variation. It also seems essential to investigate their level of development in evaluating argument before we can interpret the effectiveness of different persuasive text structures.

The Influence of Persuasion on the Critical Reading of Argument

Argument structure and the nature of persuasive content have been shown to influence the critical reading of argument. Research revealed that the extent to which a persuasive text brings about belief change in a reader is influenced by the argument structure (e.g., two-sided refutation, two-sided nonrefutation, one-sided), by the nature of persuasive content (e.g., contentious or noncontentious), and how the author appeals to the audience, more emotionally or more factually. Thus, the extent to which readers comprehend and evaluate argument present in persuasive text will be further influenced by these characteristics.

Text Sidedness Affects Persuasiveness

Refutational two-sided text has been shown to be more persuasive among adults than one-sided and two-sided nonrefutational text (Allen, 1991; Allen et al., 1990; Buehl, et al, 2001; Hale et al, 1991; Lord et al, 1979; Murphy, 2001). Allen et al., (1990) investigated the impact of three persuasive text structures on adults' attitude change and source credibility ratings. The researchers performed three replications of previous research done by Jackson and Allen (1987), who investigated the impact of refutational and nonrefutational two-sided messages in comparison to one-sided messages. In Replication One, Allen et al. gave 680 undergraduate volunteers one of three versions of a persuasive message described as refutational two-sided, nonrefutational two-sided, or one-sided which were written by eight undergraduates on a topic of their choosing.

Following the reading of an essay, participants completed a credibility and attitude measure devised on a Likert scale. The credibility scale included questions and statements regarding the author's competence and credibility. The attitude scale included questions and statements regarding persuasiveness of author, whether or not the reader agrees with the author, and whether or not the reader's position changed. The researchers then computed correlations comparing the one-sided message to the refutational two-sided message, and comparing the one-sided message to the nonrefutational two-sided message on source credibility and attitude.

A positive correlation between one-sided and refutational two-sided text indicated that the source of the two-sided message with refutation was perceived as being more credible than the source of the one-sided message and that the two-sided message was more persuasive than the one-sided message. A negative correlation between one-sided and nonrefutational two-sided text indicated that the source of the one-sided message was slightly more credible than the nonrefutational two-sided message and the one-sided message was more persuasive than the nonrefutational two-sided message. Thus, two-sided refutational text was more persuasive than one-sided text, which was more persuasive than two-sided nonrefutational text. Allen et al. (1990) suggested that perceived source credibility might be one likely reason.

In Replication Two as in the first experiment, Allen et al. (1990) gave 610 undergraduate volunteers one of three versions of seven persuasive messages on different topics and a scale for assessing source credibility and attitude. Correlations indicated that the perceived source credibility was slightly higher for the one-sided message than for the two-sided refutational message, but there was no significant difference in credibility

perceptions of one-sided and two-sided nonrefutational. Similarly, the one-sided message was not more persuasive than the nonrefutational two-sided message. However, correlations confirmed that the two-sided refutational message was more persuasive than the one-sided message based on postreading attitude scales.

Replication Three involved 290 undergraduate volunteers. Each participant read one of three versions of a message as in Replications One and Two but on different topics followed by the completion of an attitude measure. Correlation data indicated that one-sided persuasive text and nonrefutational two-sided persuasive text did not differ in persuasiveness, however, two-sided refutational text was more persuasive than one-sided persuasive text (Allen et al., 1990).

When Allen et al. (1990) combined data across replications they found that the one-sided message source was perceived as more credible than the two-sided nonrefutational message source, but the two-sided refutational message source was perceived to be more credible than the one-sided message source. As far as persuasiveness, the one-sided message was more persuasive than the two-sided nonrefutational message, but participants found the refutational two-sided message to be most persuasive.

Allen et al. concluded that the results of all replications provided strong support for the previous meta-analytic findings of Jackson and Allen (1987). Findings consistent with Jackson and Allen's meta-analysis included: (a) source credibility and message persuasiveness do not differ for one-sided and nonrefutational two-sided messages, (b) refutational two-sided message sources are perceived to be more credible than one-sided, and (c) refutational two-sided messages are more persuasive in changing reader attitude

than are one-sided messages. In addition, all of the results were consistent across topics which indicated that message persuasiveness was unaffected by topic (Allen et al., 1990).

Allen et al. (1990) compared the effects of all three persuasive text structures on source credibility and attitude change and found two-sided refutation to be more credible and more persuasive than one-sided and two-sided nonrefutation. Buehl et al. (2001) explored the influence of one-sided and nonrefutational two-sided text on beliefs, knowledge, interest, source credibility, and other reactions. A total of 93 undergraduate students, mostly juniors and seniors, enrolled in a human development course at a large urban university participated in the study. Participants completed a prereading task, read two naturally occurring articles on controversial topics taken from a major newspaper and news magazine, and then completed a postreading task. The Reform article was a one-sided text on the topic of student responsibility for learning and the V-Chip article was a two-sided nonrefutational text which discussed a device that blocks the reception of television shows rated as highly violent or inappropriate for children.

Both prereading and postreading tasks assessed participants' beliefs, perceived knowledge, demonstrated knowledge, interests, and their reactions to the specific features of the articles. For assessing belief change, the researchers asked participants to indicate their position on a premise relative to each article at prereading and postreading. For example, participants were presented with the statement from the Reform article, "Ultimately, it is up to the student to want to learn" and participants responded by placing an X in a box along a 10-point scale that ranged from "strongly disagree" to "strongly agree." For the nonrefutational two-sided text (V-Chip Article), Buehl et al. (2001) chose one premise that reflected an argument against the use of the V-Chip, "If you place a chip

in a television set to exclude violence it becomes an all purpose censor.” Similarly, participant interest was measured by asking participants to rate their interest in the topics by placing an X in a box along a 10-point scale that ranged from “very disinterested” to “very interested.”

Likewise, the researchers assessed perceived knowledge at prereading and postreading by asking participants to indicate how much they thought they knew about the topics listed. Participants placed an X in a box along a 10-point scale that ranged from “relatively nothing” to “a great deal” for each text topic. Buehl et al. (2001) also measured demonstrated knowledge at prereading and postreading by asking participants to “jot down words, sentences, and phrases that tell what you know about each of the terms.” Responses were then coded according to a rubric based on the amount and accuracy of listed information. In addition, Buehl et al. (2001) assessed participants’ reactions to each article as a postreading task. Participants were asked to rate the article on six characteristics including presentation of a balanced perspective, source credibility, persuasiveness, readability, emotional reactions, and interestingness using the 10-point scale system.

Buehl et al. (2001) found that participants’ beliefs, knowledge, and interest were impacted in different ways after reading the two articles. First, analyses revealed that the one-sided text (Reform article) significantly influenced demonstrated knowledge and beliefs. With regard to the two-sided nonrefutation text (V-Chip article), perceived knowledge, demonstrated knowledge, and interest were significantly changed, but not beliefs. Buehl et al. concluded that one-sided and two-sided messages impact readers’ beliefs, knowledge, and interest differently depending upon text sidedness.

After examining the data for differential persuasiveness of the two text structures, Buehl et al. (2001) found that more participants changed their beliefs after reading the nonrefutational two-sided text than for the one-sided text. However, only 37% increased in their agreement with the position advocated by the author, while 37% decreased and 27% showed no change in beliefs. With regard to the one-sided text, 36% showed an increased agreement while only 18% decreased in agreement with the position advocated by the author and 47% reported no change in their beliefs. Buehl et al. concluded that although more readers changed their beliefs after reading the nonrefutational two-sided text (74%), half of them were persuaded toward the advocated view but half of them were persuaded against it. On the other hand, fewer readers changed their mind after reading the one-sided text (54%), but two-thirds of them were persuaded toward the view advocated by the author. In addition, almost half of the participants maintained their viewpoint after reading the one-sided text. Buehl et al. concluded that the one-sided text was more effective at maintaining or changing readers' beliefs toward the author's view.

Buehl et al. (2001) analyzed the profiles of more and less persuaded readers to further examine the possibility of case building. The researchers argued that if case building occurred that there would be no change or an increase in beliefs among those individuals with strong initial beliefs. When postreading views remained constant or increased, the researchers speculated that readers were engaged in case building. Of the 93 participants in this study, 26 that held strong beliefs before reading the V-Chip article either maintained their position at postreading or strengthened their position. Likewise, 26 participants that held strong beliefs before reading the Reform article maintained or strengthened their initial belief at postreading. Hence, participants with strong beliefs

appeared to engage in case building. In addition, these participants reported significantly more perceived knowledge about the V-Chip article than participants who decreased in agreement with the advocated view at postreading, implicating perceived knowledge as a factor in belief change.

Buehl et al. (2001) examined the differential impact of text structure on students' prereading and postreading knowledge and found significant differences in perceived and demonstrated knowledge. After reading, participants believed that they knew more about the two-sided subject (V-Chip) and actually demonstrated more knowledge of the subject compared to that of the one-sided text (Reform). In conclusion, Buehl et al. stated that while one-sided text was more persuasive, the two-sided nonrefutation impacted students' demonstrated knowledge of the issue more than the one-sided text. In addition, there was no significant difference in topic interest from prereading to postreading.

Buehl et al. (2001) also explored readers' reactions to the texts with regard to whether or not (a) the author presented a balanced argument, (b) the author was credible, (c) the arguments were persuasive, (d) the article was easy to comprehend, (e) the article was emotionally appealing, and (f) the article was interesting. The researchers found that participants reacted more favorably to the two-sided nonrefutation text. Participants found the article easier to comprehend, the argument balanced, the author more credible, and the arguments more persuasive.

Although Buehl et al.'s (2001) finding that one-sided text is more persuasive than two-sided nonrefutation was not consistent with Allen et al.'s (1990) previous analysis, results were consistent with Allen's (1991) findings. Both Buehl et al. and Allen found that one-sided text was significantly more persuasive than two-sided nonrefutation.

Allen's work (1991) focused on explaining attitude change by testing two preexisting hypotheses. The first hypothesis was based on the Elaboration Likelihood Model (ELM) proposed by Petty and Cacioppo (1981, 1986). This hypothesis holds that "permanent attitude change results from cognitive elaborations made by the audience after receiving a message" (Allen, 1991, p. 391). For example, audience favorableness toward a topic is considered a motivating factor for processing and evaluating information. The ELM predicts that a one-sided message will be more persuasive for a favorable audience because the message focuses on the agreeable arguments to the exclusion of counterarguments, thereby focusing the audience's attention on the opinion advocated by the message sender. The ELM also predicts that a two-sided message will be more persuasive for an unfavorable audience because the message content is informative, admits counterarguments, and provides reasoning for why they are unacceptable (Allen, 1991). Thus, the EML considers audience favorableness toward topic.

The second hypothesis was the Discounting hypothesis which argues that "a source who fails to meet an expectation or exceeds an expectation produces a reevaluation by an audience" (Allen, 1991, p. 392). For example, a source addresses an audience on a controversial issue but does not admit the existence of opposing viewpoints. As a result, the audience may "discount" the source's opinion. On the other hand, a two-sided message admits counterarguments which increase the effectiveness of the source by increasing source credibility. This hypothesis predicts that a refutational two-sided message is more persuasive than a one-sided message and a nonrefutational two-sided message based on the audience's reaction to content rather than audience favorableness or topic variables (Allen, 1991).

Allen (1991) obtained all empirical studies through 1985 that compared the persuasiveness of a one-sided and a two-sided message and coded each study for audience favorability (e.g., favorable, unfavorable, unknown) and type of two-sided message (refutational, nonrefutational). His statistical analyses indicated that overall, the two-sided message was slightly more persuasive than the one-sided message which suggested the presence of moderating variables as predicted by hypothesis one. However, when the two-sided messages were compared, Allen found that nonrefutational two-sided messages were significantly less persuasive than one-sided messages and refutational two-sided messages were significantly more persuasive than one-sided messages. Allen concluded that the results support hypothesis two, the Discounting hypothesis, and suggested that the results demonstrate the superiority of considering counterarguments on audiences. With regard to audience favorability as a moderating factor, neither favorable nor unfavorable audiences were consistently persuaded leaving hypothesis one unsupported by the analysis.

Research studies comparing text persuasiveness have revealed that refutational two-sided texts are more persuasive for adults than both one-sided and two-sided nonrefutation text and that one-sided text is more persuasive than two-sided nonrefutation text (Allen, 1991; Allen et al., 1990; Buehl et al., 2001). Hale, Mongeau, and Thomas (1991) suggested that the effectiveness of sidedness on adult readers may depend upon the perceived strength of the author's argument and that direct refutation may appear to strengthen an author's argument rendering it more persuasive. Regarding two-sided nonrefutation, Lord et al.(1979) found that when adults were presented with conflicting arguments on a topic, they strengthened their initial beliefs rather than being persuaded

toward the opposite view. Proponents were more in favor of capital punishment and opponents were more against it. Lord et al. described this phenomenon as “attitude polarization.” Their results indicate that two-sided nonrefutation strengthens previously held beliefs.

But little is known about the effectiveness of these three persuasive structures among middle-school students. It is possible that sidedness and the refutational nature of the text may play a similar role in persuading the middle-school reader. For instance, it is possible that for middle-school readers, the stronger the perceived argument is, the more persuasive the message, which is the case when adults read two-sided refutation. In any case, one cannot generalize work with adults to middle-school readers.

In addition, the relationship between text persuasiveness, comprehension, and argument evaluation is not clear among middle-school students. As I wrote earlier, research in the comprehension and evaluation of argument informed us that adults have trouble distinguishing between the parts of an argument and thus evaluating them (Larson et al., 2004; Kuhn, 1992; Kuhn et al., 1988). Research also indicated that children have difficulty identifying the basic elements of an argument and evaluating them (Chambliss & Murphy, 2001; Golder & Coirier, 1994; Kuhn et al., 1988).

Similarly, middle-school readers may not have a schema for argument, particularly complex argument or two-sided refutation and thus, may not be able to recognize counterarguments or be able to comprehend them. However, it may be possible that two-sided texts that contain direct refutation assist the reader in identifying and comprehending the author’s argument, which seems to be the case for adults in Murphy’s (2001) research reviewed next. It seems that a logical next step would be to explore the

influence of sidedness on the comprehension and evaluation of argument as well as its influence on belief change among middle-school students. Moreover, it seems essential to explore the influence of persuasive content on belief change among middle-school readers to further inform instructional design.

Content Affects Persuasiveness

The nature of the content of persuasive text is important in persuading the reader (Chambliss, 1994). Aristotle described three means of persuasion in which the speaker's language is indicative of his or her main appeal: appealing to the character and credibility of the speaker; appealing to the emotions of the audience; or demonstrating the truth of an idea (Brooks & Warren, 1987; Cooper, 1932; Chambliss, 1994; Voss & Van Dyke, 2001). These "artistic" proofs (Cooper, 1932) are created by the author to convince an audience. For example, an author may choose to use facts to prove the truth of a claim, personal experience that the audience will identify with, or quote several experts to strengthen author credibility and character.

Authors choose the nature of the information to be included in a persuasive message according to their purpose of convincing the audience toward their view. To what degree an audience is influenced will depend upon their critical reading competence as well as other factors, such as the presence of artistic proofs. Murphy's (2001) work illustrated for us which artistic proofs adult readers found most persuasive. Her main goal was to examine the persuasiveness of text content by comparing students' and experts' perceptions of persuasiveness relative to naturally occurring persuasive articles. Specifically, Murphy investigated what naturally occurring texts participants found persuasive, and what criteria they used to make such a determination.

Murphy (2001) selected two groups of participants, one student group and one expert group. The first group of 195 undergraduates was chosen from college juniors and seniors who were enrolled in an introductory educational psychology course at a large university. The second group consisted of seven nationally recognized experts in text-persuasion and conceptual change who would be familiar with characteristics of persuasive texts.

Murphy (2001) chose 21 naturally occurring persuasive articles that presented an argument on some contemporary issue from various major newspapers and news magazines. The 21 texts varied in length, topic, and argument style (e.g., one-sided, two-sided refutation, and two-sided nonrefutation). Of the 21 articles, Murphy used the two most persuasive and the two least persuasive articles.

The first of the two most persuasive articles argued for the creation of an AIDS vaccine to combat this growing epidemic (Global Epidemic). Global Epidemic relied heavily on statistical data but the author opened the article with a personal experience about a Kenyan mother of four who contracted HIV. The second of the two most persuasive articles argued that legalizing doctor-assisted suicides was unconscionable and will result in both voluntary and involuntary euthanasia (First and Last). First and Last contained emotionally appealing content suggesting that the readers' grandparent would likely be forced to die against their will. Overall, these two texts were similar in structure, content, and argument style. Both authors selected content that would appeal emotionally to readers, both employed two-sided refutational arguments, and both used nonscientific evidence to support the claim.

The first of the two articles rated as least persuasive argued that discovery of a human fossil could extend the age of the human family line more than 400,000 years (Jaws). Jaws provides detailed information on family lineage and offered alternative scientific perspectives. The second of the two articles rated as least persuasive discussed physics researchers trying to trap the elusive neutrino particle (Ghost Hunters) and attempts to persuade the reader that the sheer number of neutrinos is so large that their combined mass could determine the fate of the universe. The language and content is very scientific. Overall, these two texts were somewhat similar in structure, domain, and argument style. Both pertained to science-related domains, used two-sided nonrefutation, and used scientific evidence and language.

The initial procedure was to determine the two most and the two least persuasive texts. Murphy (2001) grouped students into 39 self-selected focus groups of five students each. Each group read and responded to four different articles individually and as a group. The Individual Report asked students to rate the persuasiveness of the article on a 5-point bi-polar scale ranging from unpersuasive to extremely persuasive. The form also asked students to determine the author's main point and to determine what made the article persuasive. The Group Report asked students to rank the articles from least to most persuasive based on group consensus. In addition, the report asked group members to provide the criteria they used to decide on their particular rankings. Group data was used to cross validate data from individual reports. Once the two most and two least persuasive articles were selected, experts were asked to complete the Individual Report form, to rate the persuasiveness of the four articles (similar to the Group Report) and to articulate the rationale for their expert ratings.

Murphy (2001) coded responses to determine if participants were able to identify the main idea or basic message of the text. Participants who were not able to identify the main idea were not included in the remaining analyses. The degree to which participants recognized the structure of the article was also coded depending on if the main idea was stated as a claim, a statement, or a topic. Murphy also coded participants' response to the question concerning what makes the article persuasive and came up with four categories of responses that were consistent with Aristotle's categories: (a) perceptions of author (e.g., structure and author language), (b) affect (e.g., emotions, interest, beliefs), (c) strength of supporting arguments (e.g., biased or balanced), and (d) evidence provided (e.g., facts, data, or diagrams).

After analyzing students' ratings for the 21 articles, Murphy (2001) found that students rated *Global Epidemic* ($M = 3.69$) and *First and Last* ($M = 3.68$) as significantly more persuasive than *Ghost Hunters* ($M = 1.83$) and *Jaws* ($M = 2.10$), which students rated as least persuasive. Murphy noted that these ratings are consistent with the persuasion literature in that two-sided refutation is more persuasive than two-sided nonrefutation. Similarly, experts rated *Global Epidemic* ($M = 3.79$) as the most persuasive and *Ghost Hunters* as the least persuasive ($M = 1.14$) but rated *First and Last* ($M = 3.00$) as only slightly more persuasive than *Jaws* ($M = 2.71$). In other words, experts found that the four articles fell along a continuum of persuasiveness, rather than either at opposite points on a scale.

Analyses of main idea responses revealed that a majority of students were able to identify the main idea of each article (>92%). By comparison, experts identified the main idea of each article with 100% accuracy (Murphy, 2001). Further analysis of the content

of main idea responses revealed that students were much more likely to report the main idea as a claim for the two most persuasive articles, *Global Epidemic* (62.9%) and *First and Last* (72.5%) and for the *Jaws* article (47.5%). In contrast, students were more likely to report the main idea as a statement (52.5%) or topic (17.5%) for the *Ghost Hunters* article. Likewise, students frequently reported statements (37.5%) or topics (15%) for main ideas for *Jaws*. The results suggested that students were more likely to report the main idea as a claim when reading the two-sided refutational texts, which they found more persuasive, and they were more likely to report the main idea as a statement when they read the two-sided nonrefutational articles, which they found to be the least persuasive (Murphy, 2001).

The results for experts were similar in that they reported the main idea of *Epidemic* and *First and Last* as claims (100% and 85.7%, respectively) and reported the main idea of *Jaws* and *Ghost Hunters* as statements (71.4 and 71.4%, respectively). Murphy drew two conclusions: (a) the more persuasive the article, the more likely participants were to represent the main idea as a claim, and (b) the less persuasive the article, the more likely participants were to represent the main idea as a statement or topic.

Murphy (2001) then coded participants' response to the question concerning what makes the article persuasive according to four categories: (a) perceptions of author (e.g., structure and author language), (b) affect (e.g., emotions, interest, beliefs), (c) strength of supporting arguments (e.g., biased or balanced), and (d) evidence provided (e.g., facts, data, or diagrams). Murphy found that participants rated multiple forms of evidence presented in support of a claim as the most persuasive factor across articles (40.8% to

86.6%). Affect was a significant factor as well with participants indicating the two most persuasive articles evoked their emotions (14.6% to 30.0%) while there was no indication of the two least persuasive articles influencing affect at all.

Participants' responses that fell into the argument category for the two most persuasive articles were between 2.4 % and 18.4 %. These results seem to indicate that participants rated the two-sided refutation as the most persuasive text based on the different forms of evidence provided in the articles, including evidence that was emotionally evoking, rather than on the refutational nature of the argument. In other words, it seems that when evidence and emotional appeals were present the refutational structure itself was not rated as a highly influential factor. Alexander et al.'s (2001) work sheds more light on the persuasiveness of content in two-sided refutation reviewed next.

The results of Murphy's (2001) research indicated that forms of evidence and emotional appeals in particular play powerful roles in persuasion among adults. Murphy's work helped us to understand that at least two factors must be present in order for adult readers to find a text highly persuasive: (a) multiple forms of evidence (e.g., examples, personal testimony, scenarios, expert opinion, statistics, graphs, etc.), and (b) personally involving information that appeals to reader emotions or beliefs. Overall, the results seem to give a hierarchical structure to Aristotle's artistic proofs with evidence presented in support of an argument at the top of the hierarchy, emotional appeals in the middle, and author perceptions and strength of argument at the bottom (Murphy, 2001).

Murphy's (2001) results revealed the influence of persuasive content. But according to Buehl et al. (2001), persuaded readers may focus on the more favorable evidence that is consistent with their views. Thus, it is possible that participants' beliefs

at prereading were already highly aligned with the positions advocated in the articles used in Murphy's study, making the articles containing emotional appeals seem less persuasive as Alexander et al. (2001) found in their work. Alexander et al. (2001) explored the interplay of affective variables, such as beliefs and knowledge, with the content of two-sided refutational texts.

Alexander et al.'s (2001) work examined the two factors that Murphy (2001) found must be present for text to be highly persuasive: multiple forms of evidence and emotionally appealing information. Alexander et al.'s goal was to extend previous research in factors which promote changes in readers' knowledge, beliefs, and interest after reading messages containing contentious content. Specifically, they explored the nature of naturally occurring persuasive text from magazine articles structured as two-sided refutation, each containing one of two artistic proofs: appealing to the emotions of the audience and demonstrating the truth in an idea. All participants were selected from one large urban university. Participants included 37 undergraduates who were mostly juniors and seniors enrolled in an upper level educational psychology course. Graduate student participants included 25 masters and doctoral students, most of whom sought degrees in human development. The 20 faculty member volunteers were employed in the colleges of education and were nationally recognized experts in their fields.

One article, the Same-Sex Marriage article, relied heavily on emotional appeals, such as personal experiences, to support a favorable stance on the legalization of same-sex marriages. The other article, Prenatal Similarities, relied more on facts to support the idea that human embryos and fetuses were similar to other animal embryos and fetuses. Both articles focused on controversial issues and contained contentious content. In

addition, both articles came from the same issue of Life magazine and were read directly from the magazine.

Participants completed prereading and postreading tasks to assess topic beliefs, topic knowledge, and topic interest. Topic beliefs were assessed by asking participants to indicate their position on a premise relative to each article at prereading and postreading. For example, participants were presented with the statement from the Same-Sex Marriage article, “The federal government should move to legalize same-sex marriages.” and participants responded by placing an X along a continuum running from “strongly disagree” to “strongly agree.” Participant interest was measured by asking participants to rate their interest in the topics at prereading and to rate how interesting the article was at postreading by placing an X along a line that ranged from “very disinterested” to “very interested.”

Alexander et al. (2001) also assessed alternate forms of knowledge. Perceived knowledge was assessed by asking participants to indicate how much they thought they knew about the topics at prereading and then how much they thought they knew at postreading. Participants placed an X along a continuum that ranged from “relatively nothing” to “a great deal” for each text topic. The researchers then measured demonstrated knowledge by asking participants what they already knew about the subject at prereading and what they specifically learned from reading the articles at postreading. Responses were then coded based on the number of information units provided by each participant at prereading and then summed with additional knowledge units provided at postreading.

Alexander et al. (2001) found that readers' beliefs, knowledge and interest all significantly increased after reading the two texts. Although readers' beliefs were more positive after reading the Same-Sex Marriage article, readers' initial beliefs toward same-sex marriage were more in keeping with the author's main premise at prereading, leaving limited room for persuasion to happen. In contrast, there was a more marked increase in beliefs toward the author's premise after reading the Prenatal Similarities article because more readers' were not in keeping with the author's main premise until postreading.

With regard to text effects, readers showed a significantly greater increase in demonstrated knowledge after reading the Prenatal Similarities article than for the Same-Sex Marriage article, probably because this text relied heavily on factual support to present its argument. However, the faculty was the source of the significant effect for demonstrated knowledge, probably due to their expertise in the field (Alexander et al., 2001).

Finally, Alexander et al. (2001) analyzed knowledge and interests of three statistically different persuasion groups: a less persuaded group, a moderately persuaded group, and a more persuaded group. The researchers determined that results for Prenatal Similarities demonstrated a significant overall effect for group. Analyses showed that for the Prenatal Similarities article, perceived knowledge was significantly different between the more and less persuaded groups. Those participants in the more persuaded group had significantly lower perceived knowledge scores before reading than those participants in the less persuaded group. Alexander et al. suggested that higher perceived knowledge before reading might present more of a challenge to the author wishing to change beliefs about prenatal similarities among mammals for several reasons. Maybe readers' stronger

perceptions of their knowledge promoted a more critical analysis of the authors' arguments. Domain experts may be more conservative in their judgments than others because of their deep understanding of the domain. It is also possible that higher perceived knowledge reduces the desire to process and elaborate the argument presented (Alexander et al., 2001).

For the Same-Sex Marriage article, however, readers' perceived knowledge and beliefs were significantly positively correlated at pre-reading and post-reading. Because the authors depended on the personal story of a gay couple more than factual content to support their argument, readers' perceived knowledge at prereading was probably not as challenged by the article's content (Alexander et al., 2001).

Alexander et al. (2001) concluded that perceived and demonstrated knowledge appears to influence the persuasion process in different ways and that further analysis is warranted. The researchers also concluded that the paths to persuasion not only depend upon topic knowledge but on whether an issue is framed more emotionally or more factually. Although Alexander et al. found that a refutational two-sided text that relied more on factual support was more persuasive in changing adult readers' beliefs than a refutational two-sided-sided text that relied more on emotional appeals, readers' prereading beliefs and perceived knowledge played a significant role in the persuasion process.

Likewise, the work of Alexander, Murphy, Buehl, and Sperl (1998) revealed similar results. Using the same methods and articles as Alexander et al. (2001), undergraduates, graduate students, and faculty were asked to indicate their stance on a statement derived from the premise of the articles and how much they knew at prereading

and postreading. Alexander et al. (1998) found that the Prenatal Similarities article was highly persuasive with an average change in prereading to postreading position of $M=28.59$ ($SD=5.40$), whereas the Same-Sex Marriage article was somewhat persuasive with an average change in prereading to postreading position of $M=8.88$ ($SD=2.17$). Also consistent was the finding that the more highly persuaded participants had lower position and knowledge ratings at prereading than less persuaded participants or participants who showed no change in their position.

Overall, Alexander and colleagues (Alexander, Murphy, Buehl, and Sperl, 1998; Alexander, Buehl, & Sperl, 2001) have demonstrated the importance of considering the nature of contentious content relative to readers' beliefs and topic knowledge. Research showed that adults rated two-sided refutation as the most persuasive text (Murphy, 2001). The same research revealed that the factors responsible for making the two-sided refutation articles highly persuasive were multiple forms of evidence and emotionally appealing information rather than the refutational structure of the argument (Murphy, 2001). Research also showed that when belief change was measured, two-sided refutation that relied heavily on facts as evidence was more persuasive than two-sided refutation that relied heavily on emotionally appealing information, such as personal scenarios (Alexander et al., 2001). But little is known concerning the influence of content characteristics of persuasive text among middle-school readers. It is likely that the same trend would be seen, but results with adults should not be generalized to younger students who have much less experience with persuasive text and probably much less topic knowledge than adults.

Examples of informal contentious argument are widespread (e.g. letters to the editor, magazine articles) are worthy of our attention, and need to be evaluated accordingly (Secor, 2003). However, research points out the need to explore how children in particular comprehend, analyze, and evaluate contentious argument. So far, researchers have explored children's argument comprehension and analysis by designing texts that focused on noncontentious argument (Chambliss, 1995; Chambliss & Murphy, 2001, Golder & Coirier, 1994). To be sure, researchers have explored how adults comprehend, analyze and evaluate persuasive messages and are persuaded by them (Allen, 1990; Alexander et al., 1998, 2001; Buehl et al., 2001; Hale et al, 1991; Kuhn, 1992; Larson et al., 2004; Lord et al., 1979; Murphy, 2001). But little is known concerning how well middle-school readers comprehend, analyze, and evaluate persuasive structures, including those containing contentious argument and appeals. Because readers are more likely to encounter argument containing contentious content than not (Chambliss, 1995), it seems essential to investigate how it might influence argument comprehension, analysis, and evaluation among middle-school readers prior to designing instructional approaches with persuasive texts.

Summary

The purpose of this research is to explore sixth-, seventh-, and eighth-grade readers' comprehension and critical reading of lengthy written persuasive text. This research specifically seeks to describe how text sidedness influences middle-school readers' comprehension, analysis, and evaluation of persuasive text. This research also seeks to describe how text sidedness and persuasive content contribute to text persuasiveness and perceived knowledge change among middle-school readers. Finally,

this study explores middle-school readers' rationales and strategies used in the comprehension and evaluation process. In the next chapter, I will describe the method of the present study in detail.

Chapter 3: Method

The present study was a 3 (Grade Level) x 3 (Text Sidedness) x 2 or 4 (Repeated Measure) mixed design. The three grade levels were sixth-, seventh-, and eighth-grade students. The three persuasive texts were structured as one-sided argument, two-sided refutation, and two-sided nonrefutation. The repeated measures with two levels were belief ratings and knowledge ratings at prereading and postreading and content-specific belief ratings during reading. The repeated measures with four levels were evaluative reasoning ratings on four premise statements derived from the texts read.

The present study also included nonparametric measures of text analysis and comprehension. In addition, Class could not be considered in the above mixed design due to unequal class sizes. However, this study included a preliminary study of ability level in a 3 (Class) x 2 (Repeated Measure) mixed design. The three classes were gifted reading, heterogeneous reading, and inclusion reading. The two repeated measures were belief ratings and knowledge ratings at prereading and postreading and content-specific belief ratings during reading. To compare classes, I used the random sampling procedure to form heterogeneous and inclusion reading class samples the same size as the gifted reading class. The present study also incorporated open-ended concurrent and retroactive verbal protocol analyses (Pressley & Afflerbach, 1995) to describe students' thinking processes during and after reading.

Participants

With the exception of pilot test participants, I invited approximately 552 students who attended one middle school to participate in the main study. The school was in a small rural town located in a mid-Atlantic state. I extended invitations to nine sixth-

grade, eight seventh-grade, and nine eighth-grade reading classes. A total of 379 students gained permission to participate. Twenty-two participants were absent and did not complete the reading tasks. I collected demographic characteristics from the remaining 357 participants as a prereading measure located in the “Before Reading” section of each reading task booklet. Demographic information revealed that 87% of participants identified themselves as White, 2% as African American, 2% as Hispanic or Latino, 2% as Asian, 1% as American Indian, and 6% as a combination of ethnicities. In addition, 44% percent of the students identified themselves as male and 56% as female. Students ranged in age from 11.5 years to 15.25 years with a mean age of 13.15 years.

I asked all students for their assent to participate in the study by explaining the reading task as a paper-and-pencil task or as a think aloud that I audio recorded. I asked students to indicate whether or not they agreed to be audio recorded during a think aloud as they read. I explained to the parent or guardian what students will be asked to do in a Parental Permission form and that they must indicate whether or not they agree to have their child audio recorded as their child thinks aloud during reading.

From the group of students with permission to be audio recorded, I asked reading teachers to select one female and one male in each class whose reading performance was representative of that class and who would be inclined to share their thinking about text. I chose 26 students to participate in the think aloud protocol analyses from the list of teacher recommendations, one student from each reading class. A total of 12 male and 14 female middle-school students completed the think aloud protocol tasks while the rest of their classmates completed the task booklet in their reading classroom.

Classroom Contexts

Reading classes were, for the most part, heterogeneous with two exceptions. Each grade level had one inclusion reading class, which consisted of some of the lowest performing readers and students with individual education plans in reading. Additionally, each grade level had one classroom of gifted students which consisted of the highest performing students with individual education plans in reading. Grade six had one homogeneously-grouped low performing reading class whereas the other grades did not. The middle-school reading specialist collaborated with sixth-grade teachers regarding instructional design for the lowest performing readers and worked with all students in the inclusion and the homogeneously-grouped reading classroom. All other reading classes were a heterogeneous mix of low-performing to high-performing readers. Reading classes met everyday for a 50-minute period.

Six different teachers taught reading classes in this middle school. Each teacher delivered instruction in argument or persuasive text using their own materials and approaches. Sixth-grade teachers explicitly taught the identification and interpretation of the parts of an argument, including concepts such as topic, author's viewpoint, main point, supporting evidence, opposing viewpoint, type of writing, author's purpose, and bias. Sixth-grade students practiced reading and identifying the parts of an author's argument in newspaper editorials, essays, seventh-grade student compositions, and Internet articles on a variety of issues. Students highlighted the parts of the author's argument in different colors and/or filled in a graphic organizer called an argument chart for each article.

One sixth-grade teacher, who taught both an inclusion reading class and a low

reading class, engaged his four reading classes in comprehending written argument over a three-week unit in persuasive reading. The other sixth-grade teacher engaged her four reading classes in comprehending argument over an eight day unit in persuasive reading.

Seventh-grade teachers integrated persuasive text with fiction and nonfiction reading units during the first and second marking periods. Student objectives were mainly to identify the main idea or the author's position and supporting details, author's purpose, compare and contrast, and to make inferences. Seventh-grade students read and discussed newspaper articles, magazine articles, editorials, Internet articles, and reviews of books, movies, music, and technology devices. Both seventh-grade teachers had their students read and discuss persuasive text once a week during a nine-week unit in fiction reading and every day during a three-week unit in persuasive reading.

One seventh-grade teacher also delivered the same instruction to two classes of eighth-grade students. The other eighth-grade teacher delivered explicit instruction in bias, balanced perspective, author's purpose, author's perspective, text structure, fact, opinion, making inferences, and summarizing. Students practiced identifying and using the above concepts in magazine articles, newspaper articles, and other nonfiction texts during a two-week persuasive reading unit. The persuasive reading units for each grade level took place during a nonfiction unit which began in December 2006 and ended in February 2007.

One teacher taught the gifted reading classes, which was called Seminar. Grade six Seminar students read several theories on the disappearance of the Mayan culture, chose a theory they thought made sense, built on it, and defended it. Students then voted on who made the best argument. Grade seven Seminar students participated in a

toxicology convention where they had to read articles on natural toxins and choose one on which to focus. They then had to create a poster project and a PowerPoint presentation to persuade the audience that the natural toxin they chose was by far the biggest danger. Grade eight Seminar students researched video surveillance and prepared a formal debate that was judged by the building principals and several teachers. The Seminar teacher also delivered lessons on participating in a formal debate. Seminar projects lasted from two weeks for grade six to four weeks for grade eight Seminar students.

Materials

Texts

Three types of persuasive text structures have been shown to influence adults' critical reading and beliefs: one-sided text, two-sided refutation, and two-sided nonrefutation (Alexander et al., 1998, 2001; Allen, 1991; Allen et al, 1990; Buehl et al, 2001, Lord et al., 1979; Murphy, 2001). The articles for this study adhered closely to each of these three persuasive text structures. Two types of artistic proofs have been shown to influence adults' critical reading and beliefs: multiple forms of evidence and emotional appeals (Alexander et al., 2001; Murphy, 2001). While the evidence itself was a key persuasive factor among adults, the combination of evidence and emotional appeals made text highly persuasive. To examine the effectiveness of emotional appeals on middle-school readers, I chose articles containing emotionally appealing evidence, such as examples of animal abuse by zoo keepers, as well as evidence in the form of scenarios, facts, and studies. Because lengthy written contentious argument was very difficult to obtain for the youngest and lower-performing middle-school readers, I chose to rewrite the articles on zoos that were originally written for older students or adults.

I rewrote three texts so that each contained nine or ten paragraphs: one introduction paragraph, one summary paragraph, and five or six body paragraphs. I also rewrote the passages to make the vocabulary more understandable to the youngest middle-school readers. All three texts had a grade level readability of between 7.0 and 7.2, plus or minus one-half grade level, using the Dale-Chall readability formula, indicating that the material was upper sixth grade to upper seventh grade level (Readability Calculations, 2004). The three rewritten articles are in Appendix A.

I rewrote three articles on the topic of zoos using information from three sources. One source appeared in a middle-school textbook series, *Introducing Issues with Opposing Viewpoints* titled *Animal Rights* (Dudley, 2006). The books in this series were written to teach middle-school students in grades seven to ten to analyze the strength of an argument and compare it to its opposition. They contained collections of articles on controversial topics written by various authors in various public forums; however, the editor revised the original sources to help middle-school reader's understand the argument that may not have been stated explicitly. For example, the editor added to each article prereading matter that explicitly stated the author's claim, gave source information, and/or the premise from which authors argued. I rewrote the articles so that the author's claim was explicitly stated within the body of the text. The second source that I used to rewrite articles for the study was a fact sheet on zoos obtained from The People for the Ethical Treatment of Animal's (PETA) website (August, 2006). The third source on keeping animals in zoos appeared on Galenet's Opposing Viewpoints Database (Hurley, October 2006).

I chose the topic of zoos for the study texts for two main reasons. First, this

middle school was geographically located within an hour of six zoos, giving students plenty of opportunity for exposure to zoos and increased background knowledge regarding animals in zoos. Second, the topic of zoos was the least controversial among persuasive texts written for older middle school students in grades seven to ten, yet retaining an issue for which opposing viewpoints exist and may be of interest to younger middle school students in grade six.

The one-sided (1S) text, titled *Zoos Harm Animals*, represented PETA's side of the issue on keeping animals in zoos. Figure 4 represents the one-sided argument for this article in graphic form. *Zoos Harm Animals* presented PETA's argument that zoos unjustly keep animals in captivity, away from their natural homes. This one-sided article provides PETA's evidence that captivity causes stress and mental problems for many animals as well as examples of how animals are mistreated in zoos. *Zoos Harm Animals* contains 1,080 words and included different forms of evidence (e.g., research, habitat scenarios, facts, and examples of animal abuse).

The two-sided refutation (2SR) text, titled *Zoos Are Cruel*, represented both sides of the issue, but used PETA's counterclaims and refutation to discount the claims made by advocates of zoos. For example, the counterclaim by Ironmonger, author of *The Good Zoo Guide*, that taking an animal away from its natural habitat is not always cruel was presented, supported, and then refuted by PETA. The counterclaim also made by Ironmonger that zoo keepers are true animal lovers was presented, supported, and then refuted by PETA. As you can see in Figure 5, this article presented PETA's argument that zoos unjustly keep animals in captivity, away from their natural homes. PETA provided evidence that captivity causes stress and mental problems for many animals, as

well as examples of animal abuse in zoos. *Zoos Are Cruel* contained 1,081 words and the same forms of evidence presented in the one-sided article.

The two-sided nonrefutational (2SNR) text, titled *Are Zoos Cruel?* presented both sides of the issue on keeping animals in zoos in a balanced format. This text stated and then explained that animal supporters and scientists disagreed on whether or not zoos help animals or harm animals. As you can see from the graphic representation of the argument in Figure 6, John Ironmonger, author of *The Good Zoo Guide*, offered information on how zoos help animals while PETA offered information on how zoos hurt animals. *Are Zoos Cruel?* contained 1,077 words and forms of evidence similar to the one-sided and two-sided refutation text. To keep the length of this text similar to the others, the evidence was not elaborated. For example, this text did not give as many details about the instances of animal abuse as did the one-sided and two-sided refutation texts.

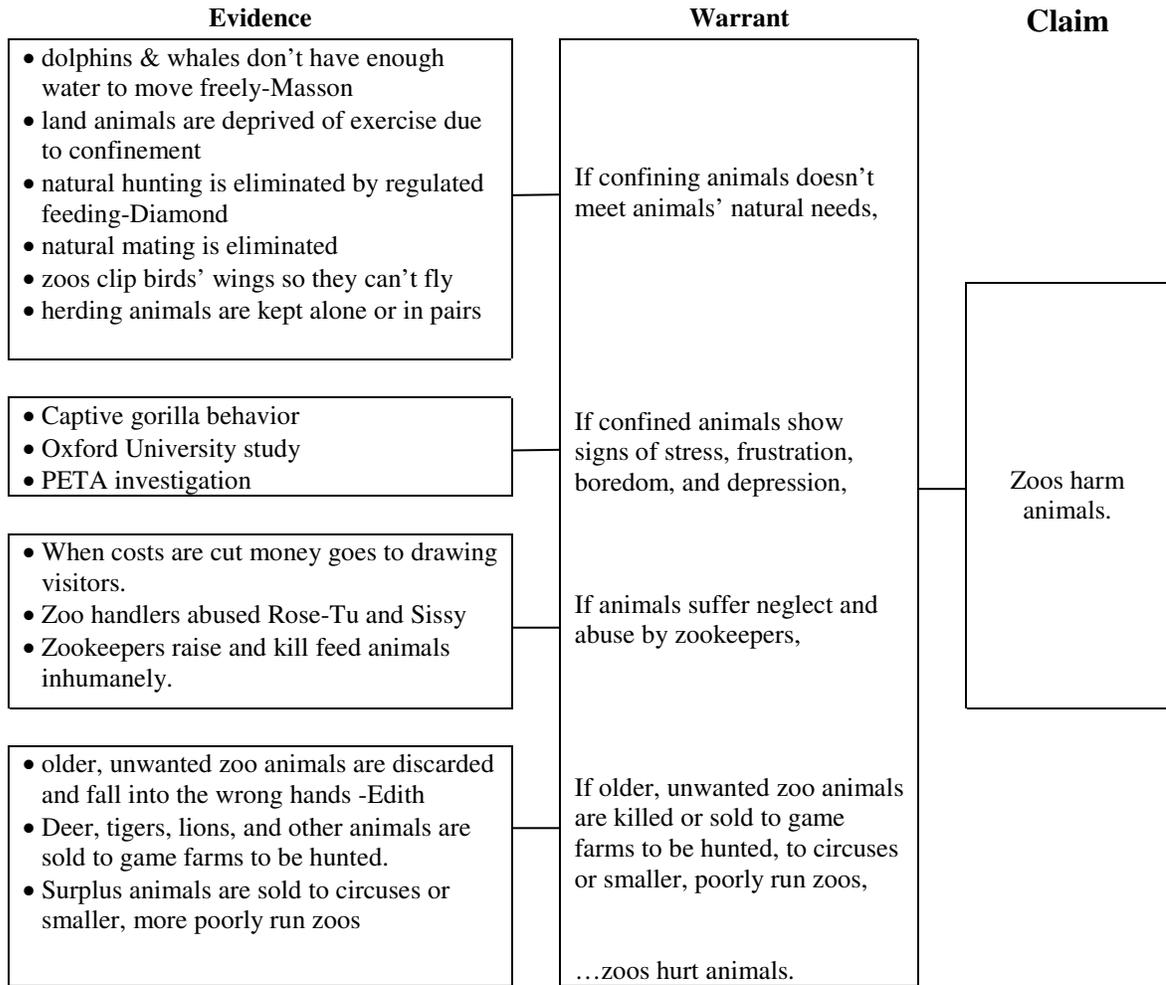


Figure 4. A Graphic Representation of the One-sided Argument in “Zoos Harm Animals”

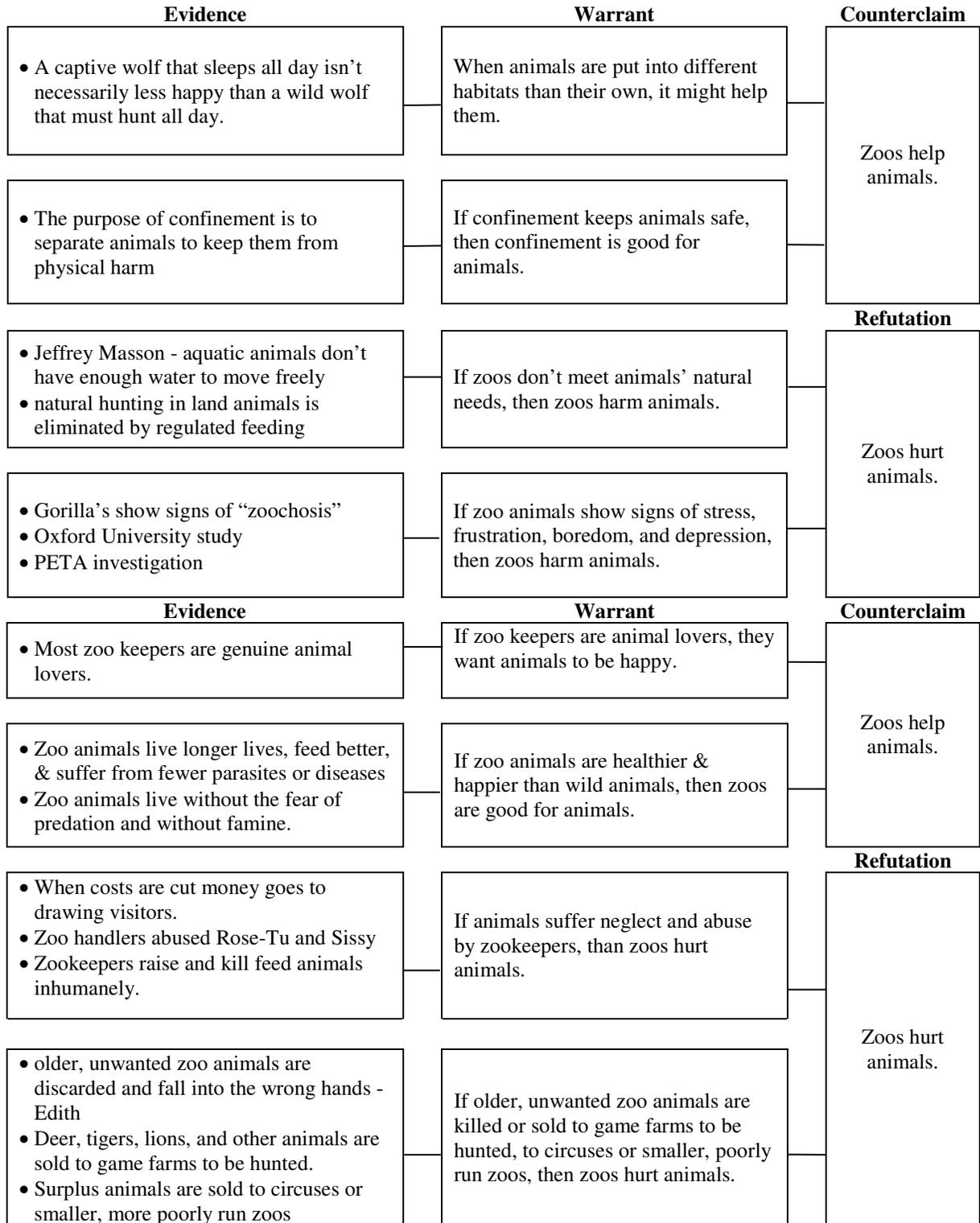


Figure 5. A Graphic Representation of the Two-sided Refutation Argument in "Zoos Are Cruel"

Main Claim – Experts disagree on whether animals should be kept in zoos.

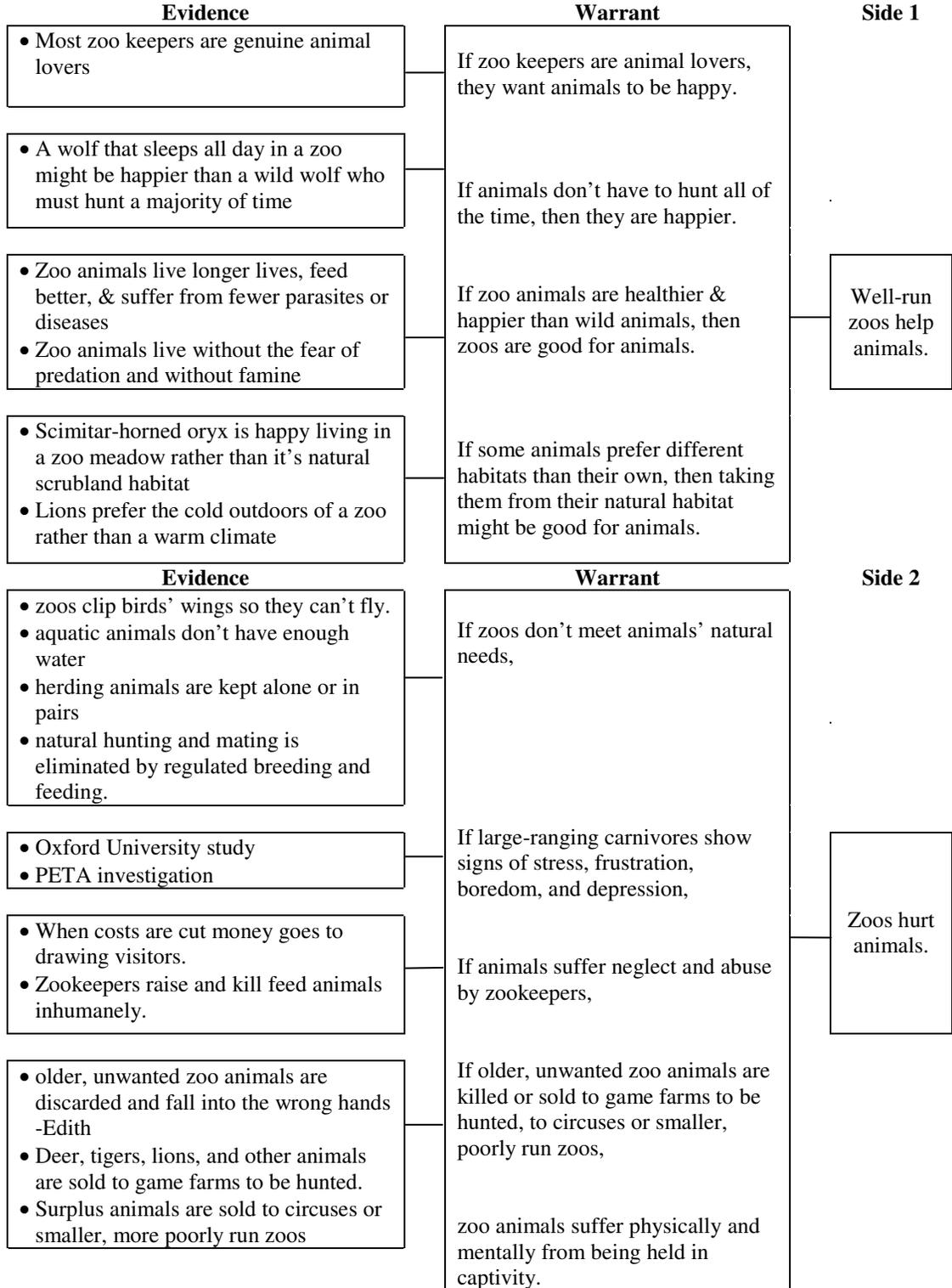


Figure 6. A Graphic Representation of the Two-sided Nonrefutation Argument in “Are Zoos Cruel?”

Response Tasks

I presented participants with two different types of paper-and-pencil tasks (e.g., ratings and multiple-choice questions) before, during, and after reading, to assess comprehension, evaluation, and changes in their beliefs and perceived knowledge. The comprehension questions were similar to those asked in previous research in the comprehension of written argument, but different in format (Chambliss, 1995; Chambliss & Murphy, 2002; Murphy, 2001). The ratings tasks were similar in answer format to measures applied in previous persuasion studies (Alexander et al., 1998, 2001; Buehl et al., 2001). In addition, I presented protocol students with concurrent and retroactive verbal tasks to explore reading processes (Pressley & Afflerbach, 1995). Reading tasks are described in more detail in the next several sections.

Reading Task Booklets. The articles and tasks were organized into reading task booklets, one for each of the three texts. The three reading task booklets are presented in Appendix B. Each booklet had three main sections: a Before Reading section, a During Reading section, and an After Reading section. Each section began with explicit directions for completion. The grade-level readability of instructions for the tasks was 5.5, plus or minus one-half grade level, using the Dale-Chall readability formula (Readability Calculations, 2004).

The Before Reading section contained sections A through C, which presented students with prereading tasks. Section A asked students for their sex, birth date, and ethnicity. Section B asked students to rate what they know about zoos. Section C asked students to rate their opinion of zoos. These measures are explained in more detail below and are displayed in the task booklets in Appendix B.

The During Reading section, Section D, instructed students to read the article and rate how much their mind changed after reading four selected paragraphs. This in-text measure is described in more detail below. I asked verbal protocol students to report verbally on what they were thinking as they read and as they completed the in-text ratings during reading.

The After Reading sections were labeled E through F. Section E instructed students to rate their knowledge of zoos. Section F instructed students to rate their opinion of zoos after reading the entire article and to indicate the basis for their evaluation. This section assessed how participants evaluated the argument presented in the text read and is described in more detail below. I asked verbal protocol students to report on what they were thinking as they completed the ratings and selected a basis for their evaluation. Section G instructed students to answer three multiple-choice comprehension questions. These questions assessed students' comprehension of written argument and are described in more detail below.

I assessed the comprehension of written argument in two ways. First, I assessed what author's purpose middle-school students assign to persuasive text relative to text sidedness. I refer to this measure as the Author's Purpose Identification measure. Second, I assessed what middle-school students identify as the main point and supporting detail of persuasive text relative to text sidedness by asking participants two multiple-choice questions after reading. I refer to these two multiple choice questions as the Argument Identification measure. Together, these three questions represented the Argument Comprehension measure.

Argument comprehension: Author's purpose identification. The Author's Purpose measure assessed how well participants recognized patterns in the article as argument written to persuade to address my first research question, *What author's purpose do middle-school students assign to persuasive text relative to text sidedness?* This question was designed to determine how many participants recognized the author's purpose to persuade, but also how many students recognized argument as text written to inform, to explain, or to entertain the reader. I asked participants to indicate the author's purpose for writing at postreading in one multiple-choice question followed by four answer choices: (a) to persuade, (b) to inform, (c) to explain, and (d) to entertain. I chose these four purposes because they were taught in the reading curriculum at this middle school. In addition, these four choices were consistent with the answer choices given on each quarterly district reading assessment at this middle school and on the state assessment in reading.

I hypothesized that middle-school students were more likely to accurately identify the author's intended purpose for writing after reading the one-sided text than after reading the two-sided refutation or two-sided nonrefutation based on the assumption that many high-school students and adults do not have an argument schema beyond a simple claim and its evidence (Chambliss, 1995; Larson et al., 2004). Furthermore, research shows that many middle-school students do not recognize text as "truly" argumentative when it contains complex argument structures, such as counterarguments and refutation, (Golder & Coirier, 1994). Additionally, many adults perceive two-sided nonrefutation as informational (Murphy, 2001), which I assumed might be the case for middle-school students as well.

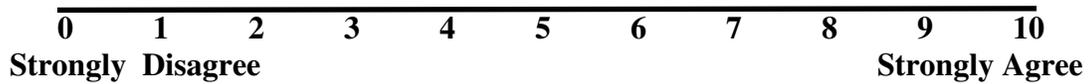
Argument comprehension: Argument identification. My second research question, *What do middle-school students identify as the main point and supporting detail of persuasive text relative to text sidedness?* was designed to determine how many students could identify the author's claim and evidence depending on which text they had read. I refer to this measure as the Argument Identification measure which assessed how well participants identified the parts of the author's argument by asking participants to identify the author's main point and supporting detail from a choice of five answers: (a) a topic statement, (b) the argument claim (i.e., the author's main claim for the one-sided and two-sided refutational text), (c) an instance of evidence presented in all three texts, (d) the nonrefutation claim (i.e., the author's main claim for the two-sided nonrefutational text), and (e) a counterclaim presented in the two-sided refutation article. For both questions, this pattern of answers would require that participants distinguish between the basic parts of an argument.

Based on past research, I hypothesized that middle-school students would be more likely to accurately identify the author's main point and supporting detail in the one-sided text containing simple argument structures than in the two-sided refutation which contained complex argument structures or in the two-sided nonrefutation text which contained a balanced argument structure. The work of several researchers revealed that many children, high school students and adults, do not have an argument schema beyond a simple claim and its evidence. Thus, adults and children have difficulty distinguishing between the parts of an argument and often confuse evidence, counterclaims or general topic statements with an argument's claim (Chambliss & Murphy, 2002; Kuhn, 1992; Kuhn et al., 1988, Larson, et al., 2004).

Argument evaluation. To answer my third research question, *How do middle-school readers evaluate argument in persuasive text relative to text sidedness?* I asked participants to indicate the basis for their after-reading ratings of four premise statements about zoos. I refer to this measure as the Evaluative Reasoning measure that assessed students' basis for evaluating each premise. The measure asked participants to choose from three options: (a) I rated the statement based mostly on the evidence presented in the article, (b) I rated the statement based mostly on what I already know about zoos, or (c) I rated the statement based mostly on what I believe or feel is true about zoos. I anticipated that middle-school students would respond in a number of ways depending on background knowledge and beliefs (Buehl et al., 2001; Kuhn et al., 1988; Lord et al., 1979; Stein & Miller, 1991, 1993), evaluative mindset (Stanovich & West, 1997) and metacognitive development in evidence weighing (Kuhn et al., 1988, 1989, 1991, 1992). I expected verbal protocol analyses to illustrate patterns in middle-school students' evaluating habits that could inform further analysis. Nonetheless, Kuhn et al. (1988) revealed that sixth-grade students showed a predominance of theory-based responses (e.g., which included responses that relied on prior knowledge, beliefs, or feelings) that vacillated between theory-based and evidence-based responses.

Belief change. My fourth research question, *How convincing is persuasive text to middle-school readers relative to text sidedness?* was designed to determine how persuasive the text structures were in changing readers' initial beliefs about keeping animals in zoos. I refer to this measure as the Belief Change measure which assessed participants' beliefs before and after reading one of three persuasive texts by instructing participants to indicate how strongly they agreed or disagreed with four premise

statements on keeping animals in zoos by placing an X above the number on a 130 mm. line that ran from “strongly disagree” to “strongly agree” as illustrated below.

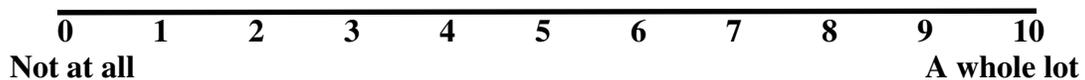


I recorded each participant’s response in millimeters to obtain a continuous measure of their beliefs with the higher number indicating stronger agreement with the articles premise. This measure was intended to indicate participants’ initial beliefs regarding the issue upon which postreading beliefs could be compared and changes could be determined. Participants’ initial beliefs are also important when examining results for evidence of biased evaluation or case building (Buehl et al., 2001; Lord et al., 2001) and when examining the relationship between beliefs and perceived knowledge (Alexander et al., 2001; Stein & Miller, 1991, 1993). In the present study, the Belief Change measure had good internal consistency with a Cronbach’s alpha coefficient for prereading and postreading belief ratings of .74.

I hypothesized that the one-sided persuasive text structure would be more successful in changing middle-school students’ initial beliefs about zoos than either of the two-sided texts based on several assumptions. First, many middle-school students do not recognize text containing complex argument structures, such as counterarguments and refutation, as highly argumentative (Golder & Coirier, 1994), and therefore, not very persuasive. Second, many adults perceive the two-sided nonrefutation structure as informational text and less persuasive than two-sided refutation (Murphy, 2001). In addition, research suggests that when readers are presented with evidence to support both

sides of an issue, readers' initial beliefs are strengthened because they selectively attend to the evidence, discounting the evidence that ran counter to their views (Lord et al., (1979). Third, according to Buehl et al. (2001), the Lord et al. (1979) study also suggests that presenting only one side of an issue to the reader will result in greater agreement with the advocated view. Also, according to Murphy (2001), adult readers rated emotionally appealing information as highly persuasive. Although all three texts in the present study contained the same instances of animal abuse, the one-sided text had the space to elaborate more on each instance whereas the two-sided refutation text had to include counterargument and refutation and the two-sided nonrefutation text had to include both sides of the issue within the same space. Thus, the one-sided text contained more emotional information than the two-sided texts.

Content-specific belief change. My fifth research question, *How convincing is the content of persuasive text to middle-school readers?* was designed to assess the effectiveness of two types of persuasive content, emotional appeals and multiple factual forms of evidence. I refer to this measure as the Content-Specific Belief Change measure. During reading, the Content-Specific Belief Change measure instructed participants to indicate how much their mind has changed about zoos after reading four specific paragraphs in each text by placing an X above the number on a 130 mm. line that ran from "not at all" to "a whole lot" as illustrated below. I recorded each participant's response in millimeters to obtain a continuous measure of their belief change with the higher number indicating greater belief change.

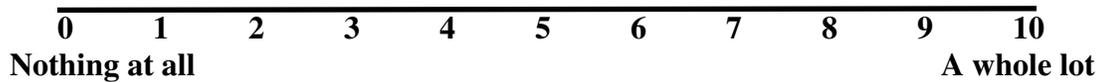


Two of the paragraphs contained different forms of factual evidence presented in support of the author's main point, such as study results and habitat scenarios. The other two paragraphs contained emotionally appealing information presented in support of the author's main point, such as negative words and instances of animal abuse in zoos. In assessing belief change during reading, I was able to measure the influence of different forms of persuasive content. This in-text measure was similar in format to that used in previous argument research (Chambliss, Torney-Purta, & Richardson, 2006). In the present study, the in-text belief ratings had good internal consistency, with a Cronbach's alpha of .88.

I hypothesized that middle-school readers would find emotionally appealing content more persuasive than different forms of factual evidence due to their inexperience with persuasive techniques. Based on Murphy's (2001) research in text persuasiveness, adults rated articles as highly persuasive when emotional appeals were present along with multiple forms of evidence and rated articles as least persuasive when they contained scientific evidence alone. But adults rated multiple forms of evidence as the most persuasive text characteristic.

Perceived knowledge change. My sixth research question, *What is the impact of sidedness on middle-school readers' perceived knowledge?* was designed to investigate how effective the persuasive texts were in changing readers' perceived knowledge. I refer to this measure as the Perceived Knowledge Change measure. The Perceived Knowledge Change measure assessed participants' perceived knowledge before and after reading one of three persuasive texts. The measure instructed participants to indicate how much they think they know about keeping animals in zoos at prereading and postreading by placing

an X above the number on a 130 mm. line that ran from “almost nothing” to “a whole lot” as illustrated below.



I recorded each participant’s response in millimeters to obtain a continuous measure of their perceived knowledge change with the higher number indicating greater perceived knowledge change. This rating scale is similar in format to that used in previous persuasion research (Alexander et al., 2001; Buehl et al., 2001). In the present study, the perceived knowledge ratings had good internal consistency with a Cronbach’s alpha of .69.

I hypothesized that the two-sided nonrefutation text structure would be more successful in changing middle-school students’ perceived knowledge about zoos because this text presented information on both sides of the issue rather than elaborating on only one side. According to Buehl et al. (2001), two-sided nonrefutation significantly increased adults’ perceived knowledge, whereas the one-sided text did not.

Beliefs relative to perceived knowledge. My seventh research question, *What is the relationship of perceived knowledge to belief change?* was designed to determine the association of perceived knowledge and students’ beliefs. Research has found that although both perceived and demonstrated knowledge are important when processing persuasion, the knowledge readers perceived to have was possibly more predictive of the persuasion process (Alexander et al, 2001) As I described earlier, the Belief Change measure and the Perceived Knowledge Change measure assessed participants’ beliefs and

perceived knowledge before and after reading and the Content-specific Belief Change measure assessed participants' beliefs during reading. The results of these three measures informed the analysis of relationships between perceived knowledge and beliefs.

I hypothesized that perceived knowledge levels would be associated with belief change (Alexander et al., 2001; Buehl et al, 2001; Kuhn et al, 1988; Stein & Miller, 1991; Stein & Miller, 1993). Researchers have found that among adults reading contentious argument structured as two-sided refutation and containing emotional appeals, perceived knowledge and beliefs were significantly positively correlated at pre-reading and post-reading (Alexander et al., 2001).

Verbal protocol tasks. My eighth research question, *How do middle-school readers process persuasive text?* was designed to describe the processes middle-school readers exhibited during and after reading to understand, analyze, and evaluate argument in persuasive text. This study conducted four verbal protocol analyses: (a) online processing, (b) author's purpose identification, (c) argument identification, and (d) evaluative reasoning.

During reading, the Online Processing measure assessed students' concurrent thought processes. I asked verbal protocol participants to report on what they were thinking as they read. Then, after reading, the Author's Purpose Identification measure assessed processes and strategies verbal participants used to figure out the author's purpose for writing. To accomplish this goal, I asked verbal protocol students to report on what they were thinking as they completed the question which asked them to identify the author's purpose for writing.

To describe how verbal protocol participants identified the author's argument, the Argument Identification measure assessed processes and strategies participants used to figure out the author's main point and a supporting detail after reading. I asked verbal protocol students to report on what they were thinking as they completed the two questions which asked them to identify the author's main point and supporting detail. Finally, the Evaluative Reasoning measure assessed how students' rated four premise statements related to the argument presented in the text read. I asked verbal protocol students to explain their thinking as they completed the after-reading ratings of four premise statements on zoos and as they selected an evaluative basis for each rating.

Procedures

I first conducted a pilot test of the articles and measures contained in the reading task booklets described earlier. I fine-tuned the measures and revised the texts and procedures, based on the results of the pilot test, and then conducted the main study.

Pilot Study

Initially, I conducted a pilot test of the reading tasks one month prior to the main study. I invited nine students, three from each grade, to participate in the pilot test per reading teacher recommendation. Six students, two in each grade, with permission to participate in the pilot and to be audio recorded, individually completed a think aloud protocol with me in the school reading center. I conducted concurrent verbal protocols with each pilot student (Pressley & Afflerbach, 1995). I used an open structure with four students by asking them to think aloud as they read. I gave explicit directions to two students to think aloud about the author's main idea. Then, I conducted retroactive verbal protocols with each student after reading using an open structure by asking students to

think aloud as they completed ratings (Pressley & Afflerbach, 1995). I used the outcomes from the pilot test to revise the articles and measures in the task booklets for the main study.

The specific goals of the pilot study were: (a) to practice the procedures designed for verbal protocol analyses to be used in the main study, (b) to revise the proposed verbal protocol procedures where necessary, (c) to determine what confusion the article, directions, or questions caused students and to revise accordingly, (d) to assess students' understanding of ratings and to revise accordingly, and (e) to determine the paragraphs students thought were more emotionally appealing or more factually appealing in each text to revise placement of in-text measures accordingly.

I observed during the pilot study that using the open approach to thinking aloud revealed more thought processes as they read than asking them to think aloud about the author's main point. Therefore, I decided to use the open approach with verbal protocols students in the main study. Because students were not familiar with the task to "think aloud," I changed the prompt wording to "report on what you are thinking as you read" and "report on what you are thinking as you complete the questions."

As a result of the pilot study, I repositioned two of the content-specific belief ratings because students found these two paragraphs to be either more factual or more emotional than paragraphs I had previously slated as such. To avoid students wanting to select more than one basis for evaluating premise statements, I changed the wording to "I rated the statement based **mostly** on ...". As a result of the pilot study, I also added verbal report symbols following each comprehension question to prompt students to report on what they were thinking. Pilot test verbal protocol students found the directions

understandable but the rating scales ambiguous Per student request, I placed numbers below the rating lines to help students better understand the rating tasks and effect less guessing.

Main Study

Once I gained consent from students and parents, I arranged a suitable schedule with reading teachers for administrating the reading tasks. I randomly ordered task booklets for reading teachers to distribute to participating students in each class while I met simultaneously with individual verbal protocol students in the middle-school reading center. Participants read one article on zoos structured as a one-sided persuasive text, a two-sided refutational text, or a two-sided nonrefutational text. Students without consent remained in the reading classroom and completed a persuasive reading practice test in preparation for their quarterly district assessment. Participants had the option of but were not required to make up the replaced classroom task.

Participants had 50 minutes to complete the reading task booklet. Before reading the article, participants rated themselves on what they knew about zoos and what they thought about zoos. During reading, participants rated how much their mind changed about zoos. After reading, participants rated themselves on what they knew and thought about zoos, indicated a basis for their ratings, and completed three multiple-choice comprehension questions.

I met with individual protocol students in the middle-school reading center to audio record verbal reports during and after reading. I asked Reading teachers to select one female and one male in each class whose reading performance was representative of that class and who were verbally inclined students or students who would be inclined to

share their thinking about text from the list of students who had parent permission to be audio recorded.

While I met with each verbal protocol student in the middle-school reading center, all other students completed the reading task booklets simultaneously as a paper-and-pencil task in their reading classrooms with their reading teacher. I arranged for administration of the reading tasks and verbal protocols with each reading teacher on consecutive days as illustrated in Table 1. Overall, it took a minimum of six days for teachers to administer the reading tasks to all students during reading classes while I simultaneously collected think-aloud protocols in the reading center.

Table 1. Reading Task Administration Schedule.

Reading Task Administration Schedule							
	Day 1:	Day 2:	Day 3:	Day 4:	Day 4:	Day 5:	Day 6:
Teacher:	T 1	T 2	T 3	T 4	T 4	T 5	T 6
Grade:	Grade 6	Grade 6	Grade 7	Grade 7	Grade 8	Grade 8	Gr 6-8
Team:	Team 1	Team 2	Team 1	Team 2	Team 1	Team 2	Gifted
Reading Period	Period 1	Period 2	Period 1		Period 1	Period 1	Period 1
	Period 3	Period 3	Period 2	Period 2		Period 2	Period 2
	Period 6	Period 6	Period 4	Period 3		Period 3	Period 3
	Period 7	Period 7	Period 5		Period 6	Period 4	
			Period 7		Period 7	Period 6	

Data Analysis

I analyzed the resulting data both quantitatively and qualitatively. I describe the data analyses for the paper-and-pencil tasks in the section, *Quantitative Data Analysis*.

This section is organized by research questions one through seven. I describe how I

analyzed students' verbal responses in the section, *Verbal Protocol Analysis*, to answer research question eight. This section is organized by verbal protocol task: online reading, author's purpose identification, argument identification, and evidence evaluation.

Quantitative Data Analysis

Once I scored student responses, I computed descriptive statistics for the Argument Comprehension, Evaluation, Belief Change, and Perceived Knowledge measures. I then analyzed the data using analyses of variance, chi-square tests, and correlation coefficients as appropriate for the measures and the research questions.

For example, to answer question one, *What author's purpose do middle-school students assign to persuasive text relative to text sidedness?* I computed descriptive statistics and frequencies with which students chose an author's purpose (e.g., to persuade, to explain, to inform, to entertain) depending on the structure of text that they had read. To describe what author's purpose sixth-, seventh-, and eighth-grade students identified for persuasive texts relative to sidedness, I conducted chi-square tests on Author's Purpose, Grade, and Text Sidedness. I also conducted a preliminary chi-square test on Author's Purpose and a random sample of Class to explore differences in the ability to identify the author's purpose between classes.

To answer question two, *What do middle-school students identify as the main point and supporting detail of persuasive text relative to text sidedness?* I computed descriptive statistics and frequencies of answer selections representing (a) a topic statement, (b) the argument claim, (c) evidence, (d) the nonrefutation claim, or (e) a counterclaim. To determine what sixth-, seventh-, and eighth-grade students identified as the parts of the argument in the persuasive text they read, I conducted chi square tests on

Argument Identification, Grade and Text Sidedness. I also conducted a preliminary chi-square test on Argument Identification and a random sample of Class to explore differences in the ability to identify the argument between reading classes.

To answer question three, *How do middle-school readers evaluate argument in persuasive text relative to sidedness?* I computed descriptive statistics and frequencies of responses to the Evaluative Reasoning measure according to the text read. I then computed mean frequencies and standard deviations for all students by Text Sidedness and Grade to compare how students reasoned across all four premise statements. I also computed mean frequencies and standard deviations for all students in the Class sample to compare how classes reasoned across all four premise statements. Finally, I conducted two mixed ANOVAs to analyze the influence of premise statements, grade, and text sidedness on students evaluative reasoning. For evidence-based reasoning, I conducted a 3 (Grade) x 3 (Text Sidedness) x 4 (Repeated Measures) mixed ANOVA with sidedness and grade as the between-subjects variables, and repeated measure as the within-subject variable using evidence-basis selections for premise statements as the dependent measure. I also conducted a 3 (Grade) x 3 (Text Sidedness) x 4 (Repeated Measures) mixed ANOVA with sidedness and grade as the between-subjects variables, and repeated measure as the within-subject variable using knowledge-basis together with belief-basis selections for premise statements as the dependent measure.

To answer question four, *How convincing is persuasive text to middle-school readers relative to text sidedness?* First, I computed means and standard deviations on the prereading and postreading belief ratings to determine whether or not there was an impact on readers' beliefs according to the text read. For belief change after reading, I conducted

a 3 (Grade) x 3 (Text Sidedness) x 2 (Repeated Measures) mixed ANOVA with sidedness and grade as the between-subjects variables, and repeated measure as the within-subject variable using prereading and postreading Belief ratings as the dependent measure. I also conducted a preliminary 3 (Class) x 2 (Repeated Measures) mixed ANOVA with a random sample of class as the between-subjects variable and repeated measure as the within-subject variable using prereading and postreading belief ratings as the dependent measure.

To answer question five, *How convincing is the content of persuasive text to middle-school readers?* I first computed means and standard deviations on the Content-Specific Belief ratings to determine whether or not there was an impact on readers' beliefs relative to persuasive content. I then conducted a 3 (Grade) x 3 (Text Sidedness) x 2 (Persuasive Content) mixed ANOVA with grade and text sidedness as the between-subjects variables and content type as the within-subject variable using Content-Specific Belief ratings as the dependent measure. I also conducted a preliminary 3 (Class) x 2 (Repeated Measure) mixed ANOVA with a random sample of class as the between-subjects variable and content type as the within-subject variable using content-specific belief ratings as the dependent measure.

To answer question six, *What is the impact of sidedness on middle-school readers' perceived knowledge?* I computed means and standard deviations on the prereading and postreading Perceived Knowledge ratings to determine whether or not there was an impact on readers' perceived knowledge according to the text read. Then I conducted 3 (Grade) x 3 (Text Sidedness) x 2 (Repeated Measure) mixed ANOVA with grade and text sidedness as the between-subjects variables and repeated measure as the

within-subject variable using prereading and postreading perceived knowledge ratings as the dependent measure. I also conducted a preliminary 3 (Class) x 2 (Repeated Measure) mixed ANOVA with a random sample of class as the between-subjects variable and repeated measure as the within-subject variable using prereading and postreading perceived knowledge ratings as the dependent measure.

To answer question seven, *What is the relationship of perceived knowledge to belief change?* I computed the Pearson product-moment correlation coefficient for pre- and postreading perceived knowledge, content-specific beliefs during reading, and prereading and postreading beliefs.

Verbal Protocol Analysis

To answer question eight, *How do middle-school readers process persuasive text?* I analyzed students' verbal responses using Bogden and Biklen's (2003) approach for working with and analyzing qualitative data. I transcribed all responses and developed a coding system for analysis based on Bogden and Biklen as I describe in the next sections.

Online reading processes. I analyzed protocol students' verbal reports during reading by coding and categorizing their responses. After transcribing the audio recordings and cross checking with my notes, I read through the grade six transcriptions and underlined words and phrases that repeated and stood out as representing the participants' ways of thinking. For example, the phrases "It says that...They're saying that...I didn't really know that...I don't think that...I think they should...I agree with the author that..." repeat throughout the verbal protocol data. To analyze the online verbal protocols, I began by listing these words and phrases as my preliminary coding categories. After generating the list, I tried to assign them as abbreviations to the units of

data, which consisted of phrases, clauses, and/or sentences. I modified them and then read through the data again, trying to assign the coding category abbreviations to units of data. After the coding categories proved to be useful, I further modified them using Pressley and Afflerbach's (1995) reading processes and Chambliss's (1995) strategies for understanding argument, by combining some and separating others. I refer to these coding categories as online-processing patterns. Table 2 shows the coding system I used to analyze online verbal protocols.

Table 2. Verbal Protocol Online-Processing Patterns, Codes, Descriptions, and Signals.

Online Reading Process, Code and Description	Signal
Repeating/restating text (R)	
Repeating/restating text just read to “explain” something	“It says that...”
Inference-making (Inf) -- Constructing an idea not presented in the text by combining the ideas in the text with prior knowledge of the topic	
Interpreting (I)	
Paraphrasing (P) parts of text	“They’re saying that...”
Visualizing (V) concepts inferable from a text	“I can sit here and see...”
Instantiating prior knowledge (PK)	“I saw some zoos...”
Empathizing (E) with the message in the text	“That’s sad that...”
Constructing interpretive conclusions (C)	“That’s one way of saying...”
Inducing generalizations based on the text (G)	
Macroprocessing (MP)	“You can tell that...”
Using topic-detail strategy (TS)	“The author is focusing on...”

Recognizing persuasive technique or bias (PT)	“That’s stereotyping.”
	“The author is against zoos.”
Using a structure strategy (SS)	“This shows the positive things about zoos.”
Monitoring (M)	
Whether content was previously known (MI)	“I didn’t know that...”
Source of information (MS)	“How does this guy know?”
Asking conscious questions (Q)	“What is this word? Why do the animals...?”
Evaluating (E)	
Showing approval/disapproval of content (AD)	“I disagree with...”
	“I think that’s wrong...”
Evaluating plausibility based on what the reader already knows (EA)	“I know it’s true because I’ve seen...”
Revising evaluations as text is processed (RE)	“At first I thought...but now I think...”
Suggesting alternatives (SA)	“I think they should...”
Stating personal opinion (SO)	“That’s kind of weird.”
Reacting emotionally (AR)	e.g., name calling

After finalizing the online-processing codes, I proceeded to analyze the online verbal protocols for grade seven and eight, bracketing data units and assigning processing codes. After assigning codes to all units of data, I summed processes for each student by category and text for an overall picture of what processes middle-school students exhibited as they read persuasive text. Finally, I analyzed processes by text read.

Identifying the author's purpose. After transcribing verbal protocol students' audio recordings, I analyzed responses for patterns in reasoning by coding students' responses using Chambliss' (1995) patterns for good readers as a guide and adding processes and strategies as patterns occurred in the data. I refer to these coding categories as Author's-Purpose Identification Patterns. Table 3 shows the coding system I used to analyze Author's Purpose verbal reports.

Table 3. Verbal Protocol Author's-Purpose Identification Patterns, Codes, Descriptions, and Signals.

Author's Purpose Strategy or Process	Signal
Macroprocessing (MP)	
Induces a claim from details presented	"He was giving all these examples about..."
Using topic-detail strategy (TS)	
Uses a topic/detail relationship	"It gives a lot of facts about zoos."
Recognizing persuasive technique (PT)	
Refers to persuasion	"He uses persuasion."
Using a structure strategy (SS)	
Uses claim/evidence relationship	"The author is arguing...and provides

	evidence as support.”
Identifies claim presented	“It’s arguing that zoos are harmful to animals.”
Identifies sides in the text	“It tells us one side of the story” “It presented two sides”
Recognizes importance of text content (TC)	
Refers to presence or absence of opinion	“Some of them are opinions.”
Refers to the presentation of true facts	“They give true facts about...”
Refers to important unknown information	“It provided you with facts that some people wouldn’t know”
Eliminating answers (E)	
Eliminates answers to make a selection	“He wasn’t trying to persuade or entertain or provide an explanation.”

Identifying the author’s argument. After transcribing verbal protocol students’ audio reports regarding identifying the author’s argument, I analyzed responses for patterns in reasoning by coding students’ responses using Chambliss’ (1995) patterns for good readers as a guide and adding strategies or processes as they occurred in the data. I refer to these coding categories as Argument Identification Patterns. I used this coding scheme to analyze verbal reports on identifying the main point and a supporting detail. Table 4 shows the coding system I used to analyze argument identification verbal reports.

Table 4. Argument Identification Processing Patterns, Codes, Descriptions, and Signals.

Argument Identification Process or Strategy	Signal
Macroprocessing (MP)	
Induces a claim from details presented	“He was giving information about...” “It’s mostly telling you about...”
Using topic-detail strategy (TS)	
Uses a topic/detail relationship	“It talks a lot about...”
Recognizing persuasive technique (PT)	
Refers to author’s bias	“I don’t think it’s biased because...”
Using a structure strategy (SS)	
Uses claim/evidence relationship	“The author is arguing...and provides evidence as support.”
Identifies claim presented	“It’s arguing that zoos are harmful.”
Identifies sides in the text	“It tells us one side/two sides of the story”
Recognizes importance of text content (TC)	
Refers to presence or absence of opinion	“Some of them are opinions.”
Refers to the presentation of true facts	“They give true facts about...”
Selects statement remembered	“In the passage it said...”
Selects statement they agree with	“...because animals don’t really need to be in zoos...”
Eliminating answers (E)	
Eliminates answers to make a selection	“...well that could be it, but it’s not...”

Evaluative reasoning. Recall that the Evaluative Reasoning measure assessed how students' rated four premise statements related to the argument presented in the text read. I asked verbal protocol students to explain their thinking as they completed the after-reading ratings of four premise statements on zoos and as they selected an evaluative basis for each rating. After transcribing verbal protocol students' audio recordings, I analyzed responses for patterns in reasoning by coding students' responses using Kuhn et al.'s (1988) patterns for evaluating evidence. I refer to these coding categories as Evaluative Basis Patterns. Table 5 shows the coding system I used to analyze evaluative reasoning verbal reports.

Table 5. Verbal Protocol Evaluative Basis Patterns, Codes, Descriptions, and Signals.

Evaluative Basis Pattern	Description	Signal
Evidence-based response	Uses the evidence presented to rate the premise statement	"...because they might be abused, neglected, or depressed..."
Knowledge-based response	Uses prior knowledge to rate the premise statement	"...like if a wolf is left alone without any other wolves..."
Belief-based response	Uses beliefs or feelings to rate the premise statement	"So I think that....It would be nice to....I believe that....I feel it's horrible..."

If the verbal response included any reference to the presented evidence, I classified the response as an evidence-based response. If the verbal response referred to the student's prior knowledge, I categorized the response as knowledge-based. If the verbal response referred to what the student believed or felt, I categorized the response as belief-based. If participants' responses made reference to presented evidence, this was an indication that they evaluated the premise statement using text-based information. If participants' responses made reference to their beliefs, feelings, or prior knowledge and experiences, this would be an indication that they used nontext-based sources to evaluate the premise statement.

Chapter 4: Results and Discussion

This study investigated four aspects of middle-school students' critical reading in persuasive text. First, the study investigated what middle-school students identify as the author's intended purpose for writing, the author's main claim, and the supporting evidence after reading text. I have labeled this facet of the study *Comprehending Written Argument in Persuasive Text*. Second, this study investigated how middle-school students analyze and evaluate argument in persuasive text. I have labeled this facet of the study *Evaluating Argument in Persuasive Text*. Third, this study explored how middle-school students' beliefs and knowledge are influenced by text sidedness and persuasive content. I have labeled this facet of the study *Changing Beliefs and Perceived Knowledge in Persuasive Text*. Finally, this investigation explored middle-school students' reading processes during and after reading persuasive text. The verbal protocol results from this facet of the investigation are explicated in Chapter 5. This chapter reports the results of the first three facets of the study organized by research questions subsumed by each of the three facets.

To analyze the data, I chose chi-square tests, analyses of variance, and bivariate correlation, as appropriate for the measures. The assumptions of random samples, independent observations, and cell frequency have been met for all analyses. Additionally, the assumptions of homogeneity of variance and practical significance have been met or addressed in all cases where analysis of variance was the appropriate statistical test. I did not include gender or class as a variable in any analyses because exploratory analyses revealed no statistically significant differences for gender or class. In addition, for each of the analyses of variance, I did not include the between subjects

variable of class because class sizes were not comparable, and cell sizes for the gifted classes in each grade were too small to meet the assumptions for running ANOVA.

To examine the data for differences between reading ability levels, I conducted preliminary analyses by drawing two random samples of 19 students from participants in heterogeneous and inclusion reading classes to compare with the 19 students in the gifted reading classes. Then, I conducted chi-square tests and analyses of variance on the data with class as a variable. The assumptions of random samples, independent observations, homogeneity of variance, and practical significance have been met or addressed where analysis of variance was the appropriate statistical test.

Comprehending Written Argument in Persuasive Text

In this section, I report on the results of middle-school students' comprehension of persuasive text. First, I report on what middle-school readers identified as the author's purpose for writing. Then I report on what middle-school readers identified as the author's main point and supporting detail in each text.

Identifying the Author's Purpose

My first research question, *What author's purpose do middle-school students assign to persuasive text relative to text sidedness?* was designed to determine how many participants recognized the author's purpose to persuade (or to inform, explain, or entertain) relative to text sidedness. The Author's Purpose Identification measure assessed how well students recognized patterns in the article by asking them to indicate the author's purpose for writing in one multiple-choice question with four answer choices: (a) to persuade, (b) to inform, (c) to explain, and (d) to entertain. I hypothesized that middle-school students were more likely to accurately identify the author's intended

purpose after reading the one-sided text than after reading the two-sided refutation or two-sided nonrefutation persuasive texts (Chambliss, 1995; Golder & Coirier, 1994).

To evaluate whether students between the ages of 11.5 and 15.25 years in the present investigation identified argument patterns in the text as characteristic of text written to persuade, I first computed the chi-square statistic for Author's Purpose Identification for all students. The analysis revealed that overall students tended to select the author's purpose to inform more often than to persuade, to explain, or to entertain, $X^2(3) = 250.22, p < .01$. To evaluate the difference between the means to persuade and to inform I computed an additional chi-square which revealed statistical significance, $X^2(1) = 12.6, p < .01$. A majority of students did not appear to recognize patterns in the texts as argument written to persuade. Table 6 presents the frequency with which students chose particular author's purposes and the percent of all of the students who made a particular choice.

To identify and evaluate associations between Author's Purpose Identification and Text Sidedness, I computed the chi-square statistic, which was not statistically significant. Students were as likely to identify the author's purpose as to inform after reading the one-sided text as they were after reading the two-sided refutation text and the two-sided nonrefutation text. In addition, students were as likely to accurately identify the author's purpose to persuade after reading the one-sided text as they were after reading the two-sided refutation text and the two-sided nonrefutation text (See Table 6). These findings indicate that most middle-school students were just as familiar or unfamiliar with the argument structure and persuasive techniques used in one-sided text as they were with the argument structures and persuasive techniques used in the two-sided texts.

To explore whether grade was associated with student accuracy, I conducted a chi-square analysis between Grade and Author's Purpose Identification. The chi-square revealed no statistically significant relationship between grade and author's purpose. Students in grades six, seven, and eight responded similarly (See Table 6). It appears that more schooling over the middle-school years did not increase students' familiarity with argument structure and persuasive techniques in text written to persuade.

To investigate whether ability level was associated with student accuracy, I conducted a chi-square analysis between Class and Author's Purpose Identification. The analysis revealed that overall students tended to select the author's purpose to inform more often than to persuade, to explain, or to entertain, $X^2(2) = 27.26, p < .01$. This finding is consistent with the large group analysis. The chi-square also revealed no statistically significant relationship between class and author's purpose. Students in gifted, heterogeneous, and inclusion reading classes responded similarly to the author's purpose question. Ability level did not appear to make a significant difference when the task at hand was to identify the author's purpose in text written to persuade. Table 7 presents the frequency with which students in each reading class chose particular author's purposes and the percent of all students sampled who made a particular choice.

Table 6. Frequencies and Percents for the Author's Purpose Identification by Text Sidedness and Grade.

	Author's Purpose Identified			
	Persuade	Inform	Explain	Entertain
All Students	126	189	34	2
(<i>N</i> = 351)	35.9%	53.8%	9.7%	0.6%
Text				
One-sided Text	39	75	12	1
(<i>N</i> = 127)	30.7%	59.1%	9.4%	0.8%
Two-sided Refutation	47	54	12	0
(<i>N</i> = 113)	41.6%	47.8%	10.6%	0%
Two-sided Nonrefutation	40	60	10	1
(<i>N</i> = 111)	36%	54.1%	9.0%	0.9%
Grade				
Six	51	61	12	0
(<i>N</i> = 124)	41.1%	49.2%	9.7%	0%
Seven	40	64	13	2
(<i>N</i> = 119)	33.6%	53.8%	10.9%	1.7%
Eight	35	64	9	0
(<i>N</i> = 108)	32.4%	59.3%	8.3%	0%

Table 7. Frequencies and Percents for Author’s Purpose Identification by Class.

	Author’s Purpose Identified			
	Persuade	Inform	Explain	Entertain
All Students	17	36	4	0
(n = 57)	29.8%	63.2%	7.0%	0%
Class				
Gifted	4	14	1	0
(n = 19)	21.1%	73.7%	5.3%	0%
Heterogeneous	8	8	3	0
(n = 19)	42.1%	42.1%	15.8%	0%
Inclusion	5	14	0	0
(n = 19)	26.3%	73.7%	0%	0%

Because middle-school students, regardless of grade or ability level, appear to be unfamiliar with the argument structures and persuasive techniques authors use to persuade the reader, it is likely they have difficulty identifying the parts of the author’s argument. The next section reports on this likelihood.

Identifying the Author’s Argument

My second research question, *What do middle-school students identify as the main point and supporting detail of persuasive text relative to text sidedness?* was designed to determine how many students could identify the author’s main point and supporting detail statement depending on the structure of the persuasive text they had read. The Argument Identification measure assessed how well participants identified the argument’s claim (i.e., Main Point Identification investigation) and evidence (i.e., Supporting Detail Identification investigation) by asking them to identify the author’s

main point and a supporting detail from a choice of five answers: (a) a topic statement, (b) the argument claim (i.e., the author's main claim for the one-sided and two-sided refutational text), (c) an instance of evidence presented in all three texts, (d) the nonrefutation claim (i.e., "Experts disagree on keeping animals in zoos."), and (e) a counterclaim presented in the two-sided refutation text. I hypothesized that middle-school students would be more likely to accurately identify the author's main point and supporting detail statement in the one-sided text than in the two-sided refutation or the two-sided nonrefutation text.

The work of several researchers revealed that many children, high-school students, and adults do not have an argument schema beyond a simple claim and its evidence leading readers to have difficulty distinguishing between the basic parts of an argument, often confusing evidence, counterclaims, and general topic statements with an argument's claim (Chambliss, 1995; Chambliss & Murphy, 2002; Kuhn, 1992; Kuhn et al., 1988, Larson, et al., 2004). To evaluate how middle-school students in the present investigation identified the author's main point, I first computed the chi-square statistic for Main Point for all students. The analysis revealed that overall middle-school students tended to select the topic statement more often than the argument claim statement, the evidence statement, the nonrefutation claim, or the counterclaim to represent the author's main point, $X^2(4) = 290.60, p < .01$. Whereas some middle-school students were able to identify the author's main point in persuasive text as a claim, a majority of students could not. Table 8 presents both the frequency with which students chose a main point statement and the percent of all of the students who made a particular choice.

To identify and evaluate associations between Main Point Identification and Text Sidedness, I used the chi-square test which revealed statistically significant differences relative to text sidedness, $X^2(8) = 51.52, p < .01$. Only those students who read the two-sided refutation text accurately identified the argument claim statement for the author's main point more often than selecting any of the other choices. Those students who read the one-sided text or the two-sided nonrefutation text were more likely to choose a topic statement for the author's main point than those students who read the two-sided refutation text (See Table 8). It appears from the analysis that two-sided refutation may aid middle-school students in identifying the author's claim.

To explore whether grade was associated with student accuracy, I conducted a chi-square analysis between Grade and Main Point Identification. The chi-square showed no statistically significant relationship between these variables. Students in grades six, seven, and eight were similar in their responses (See Table 8). More schooling in the middle grades did not seem to increase students' familiarity with the author's claim in persuasive text.

Table 8. Frequencies and Percents for the Main Point Identification by Text Sidedness and Grade.

	Main Point Identified				
	Topic	Argument Claim	Evidence	Nonrefutation Claim	Counter Claim
All Students	160	129	1	50	10
(<i>N</i> = 350)	45.7%	36.9%	0.3%	14.3%	2.9%
Text Sidedness					
One-sided	62	55	0	8	1
(<i>N</i> = 126)	49.2%	43.7%	0%	6.3%	0.8%
Two-sided Refutation	37	57	1	17	1
(<i>N</i> = 113)	32.7%	50.4%	0.9%	15.0%	0.9
Two-sided Nonrefutation	61	17	0	25	8
(<i>N</i> = 111)	55.0%	15.3%	0%	22.5%	7.2%
Grade					
Six	58	46	0	16	4
(<i>N</i> = 124)	46.8%	37.1%	0%	12.9%	3.2%
Seven	52	42	1	19	4
(<i>N</i> = 118)	44.1%	35.6%	.8%	16.1%	3.4%
Eight	50	41	0	15	2
(<i>N</i> = 108)	46.3%	38%	0%	13.9%	1.9%

To investigate whether ability level was associated with student accuracy, I conducted a chi-square analysis between Class and Main Point. The analysis revealed that overall students tended to select the argument claim more often than the topic statement, the nonrefutation claim, the evidence statement, or the counterclaim, $X^2(3) = 25.60, p < .01$. This finding is not consistent with the large group analysis where overall, students selected the topic statement more often than any other statement. The chi-square revealed no statistically significant relationship between class and main point. Students in gifted, heterogeneous, and inclusion reading classes responded similarly to the main point question. Reading ability level did not appear to make a difference when the task was to identify the author's main point in persuasive text. Table 9 presents the frequency with which students in each reading class chose a particular main point and the percent of all of the students sampled who made a particular choice

Table 9. Frequencies and Percents for the Main Point Identification by Class.

	Main Point Identified				
	Topic	Argument Claim	Evidence	Nonrefutation Claim	Counter Claim
All Students	22	25	0	8	2
(<i>n</i> = 57)	38.6%	43.9%	0%	14.0%	3.5%
Class					
Gifted	8	9	0	2	0
(<i>n</i> = 19)	42.1%	47.4%	0%	10.5%	0%
Heterogeneous	6	8	0	4	1
(<i>n</i> = 19)	31.6%	42.1%	0%	21.1%	5.3%
Inclusion	8	8	0	2	1
(<i>n</i> = 19)	42.1%	42.1%	0%	10.5%	5.3%

As I wrote earlier, readers of all ages have difficulty distinguishing between the parts of an argument, often confusing evidence, counterclaims, and general topic statements with an argument's claim (Chambliss, 1995; Chambliss & Murphy, 2002; Kuhn, 1992; Kuhn et al., 1988, Larson, et al., 2004). So far, the large group results of the Main Point Identification investigation seemed to support this finding. To evaluate how middle-school students in the present investigation identified the evidence presented in support of the author's claim, I first conducted the chi square test for Supporting Detail Identification for all students. The statistical analysis revealed that overall middle-school students tended to select the argument claim statement more often than any other answer choice, $X^2(4) = 52.28, p < .01$. Overall, students in the present study appeared to confuse the argument's claim statement most often with the evidence statement, followed by the nonrefutation claim, the topic statement, and the counterclaim. Table 10 presents the frequency with which students chose a supporting detail statement and the percent of all students who made a particular choice.

As I reported earlier, the Main Point Identification investigation revealed that middle-school students were more successful at identifying the author's main point in the two-sided refutation text. To identify and evaluate associations between Supporting Detail and Text Sidedness, I computed the chi-square statistic, which revealed a statistically significant relationship, $X^2(8) = 42.62, p < .01$. Students who read the one-sided text and the two-sided refutation text were more likely to accurately select the evidence statement for the supporting detail than those students who read the two-sided nonrefutation text, but only students who read the two-sided refutation text accurately identified the supporting detail statement more frequently than any of the other choices

(See Table 10). The two-sided refutation text seemed to assist middle-school students in identifying the author's claim and evidence more often than the other texts.

To explore whether grade was associated with accuracy, I conducted a chi-square analysis between Grade and Supporting Detail Identification. The chi-square revealed no overall relationship. Students responded similarly across the three grades (See Table 10). Once more, further schooling in the middle grades did not appear to make a developmental difference in the comprehension of written argument in persuasive texts.

To investigate whether ability level was associated with student accuracy in identifying the evidence statement, I conducted a chi-square analysis between Class and Supporting Detail Identification. The analysis revealed that overall students tended to select the argument claim more often than the evidence statement, the topic statement, the nonrefutation claim, or the counterclaim, $X^2(4) = 17.82, p < .01$. This finding is consistent with the large group analysis where overall, students selected the argument claim more than any other statement. Although the chi-square revealed no statistically significant relationship between class and supporting detail, students in gifted reading classes were more likely to select the evidence statement for the supporting detail than students in heterogeneous and inclusion classes. Reading ability level appeared to make a difference when the task was to identify the supporting detail in persuasive text. Table 11 presents the frequency with which students in each reading class chose a particular supporting detail statement and the percent of all of the students sampled who made a particular choice.

Table 10. Frequencies and Percents for the Supporting Detail Identification by Text Sidedness and Grade.

	Supporting Detail Identified				
	Topic	Argument Claim	Evidence	Nonrefutation Claim	Counter Claim
All Students	57	107	91	73	24
(<i>N</i> = 352)	16.2%	30.4%	25.9%	20.7%	6.8%
Text Sidedness					
One-sided Text	15	49	40	25	0
(<i>N</i> = 129)	11.6%	38.0%	31.0%	19.4%	0%
Two-sided Refutation	13	28	35	29	8
(<i>N</i> = 113)	11.5%	24.8%	31.0%	25.7%	7.1%
Two-sided Nonrefutation	29	30	16	19	16
(<i>N</i> = 110)	26.4%	27.3%	14.5%	17.3%	14.5%
Grade					
Six	19	37	36	23	8
(<i>N</i> = 123)	15.4%	30.1%	29.3%	18.7%	6.5%
Seven	20	39	27	26	9
(<i>N</i> = 121)	16.5%	32.2%	22.3%	21.5%	7.4%
Eight	18	31	28	24	7
(<i>N</i> = 108)	16.7%	28.7%	25.9%	22.2%	6.5%

Table 11. Frequencies and Percents for the Supporting Detail Identification by Class.

	Supporting Detail Identified				
	Topic	Argument Claim	Evidence	Nonrefutation Claim	Counter Claim
All Students (<i>n</i> = 57)	7 12.3%	20 35.1%	18 31.6%	8 14.0%	4 7.0%
Class					
Gifted (<i>n</i> = 19)	2 10.5%	4 21.1%	10 52.6%	3 15.8%	0 0%
Heterogeneous (<i>n</i> = 19)	2 10.5%	9 47.4%	5 26.3%	2 10.5%	1 5.3%
Inclusion (<i>n</i> = 19)	3 15.8%	7 36.8%	3 15.8%	3 15.8%	3 15.8%

Summary: Comprehending Written Argument

The results of the Author’s Purpose Identification investigation revealed that most students did not recognize the texts as written to persuade, and therefore identified the author’s purpose as to inform rather than to persuade. Further, the results did not vary by text sidedness. Consequently my first hypothesis, that middle-school students would be more likely to accurately identify the author’s intended purpose to persuade after reading the one-sided text, was not supported by the results of this investigation. Middle-school students were no more familiar with the argument pattern in the one-sided text than they were with the argument patterns the author used to persuade the reader in the two-sided refutation text.

Because middle-school students appeared to be quite unfamiliar with the argument structures and persuasive techniques used in these texts, it is no surprise that

they had difficulty identifying the parts of the author's argument. Some middle-school students were able to identify the author's main point and a supporting detail statement in the text read, however, a majority of students could not. Students appeared to confuse the evidence statement with the argument's claim statement, the nonrefutation claim, the topic statement, or the counterclaim.

Although the results revealed that students had difficulty identifying the author's argument, results varied depending on the text read. Only those students who read the two-sided refutation text accurately identified the argument claim and evidence statement for the author's main point and supporting detail more often than selecting any of the other choices. As a result, my second hypothesis that middle-school students would be more likely to accurately identify the author's main point and supporting detail statement in the one-sided text was not supported. Further, higher reading ability and more schooling across the middle grades did not guarantee a more developed argument schema or familiarity with persuasive techniques in persuasive texts.

Evaluating Argument in Persuasive Text

To answer my third research question, *How do middle-school readers evaluate argument in persuasive text relative to text sidedness?* I asked participants to indicate the basis for their after-reading ratings of four premise statements on keeping animals in zoos. Participants chose from three options: (a) I rated the statement based mostly on the evidence presented in the article, (b) I rated the statement based mostly on what I already know about zoos, or (c) I rated the statement based mostly on what I believe or feel is true about zoos. I anticipated that middle-school students would respond in a number of ways depending on background knowledge and beliefs (Buehl et al., 2001; Kuhn et al.,

1988; Lord et al., 1979; Stein & Miller, 1991, 1993), evaluative mindset (Stanovich & West, 1997) and metacognitive development in evidence weighing (Kuhn et al., 1988; Kuhn, 1989, 1991, 1992). I expected verbal protocol analyses to illustrate patterns in middle-school students' evaluating processes that could inform further analysis.

To analyze the Evaluative Reasoning data for patterns, I computed mean frequencies and standard deviations for all students by Text Sidedness and by Grade. Overall, mean frequencies indicated that students rated the premise statements based mostly on the evidence presented in the text than on nontext sources, such as their prior knowledge or beliefs. Table 12 presents the mean frequencies with which students selected an evaluative basis for their ratings of the four premise statements.

Mean frequencies for Evaluative Reasoning by Text Sidedness revealed a similar pattern in the one-sided and two-sided refutation texts where students' indicated that they based their ratings mostly on the evidence presented. Students who read the two-sided nonrefutation text indicated that they based their ratings mostly on their prior knowledge and beliefs, sources outside the text. Mean frequencies for Evaluative Reasoning by Grade revealed that students responded similarly across grades by indicating that they used mostly the evidence presented to evaluate the premise statements.

Mean frequencies for the Class sample closely resembled mean frequencies for the large group. Overall, students indicated that they used the evidence presented in the text more often than evaluating the premise statements based mostly on their beliefs or prior knowledge. Table 13 presents the mean frequencies with which students in the Class sample selected an evaluative basis after rating the premise statements.

Table 12. Mean Frequencies and Standard Deviations for the Evaluative Reasoning Measure (0-4).

	Evaluative Reasoning Selections			
	Evidence-Based Reasoning	Knowledge-Based Reasoning	Belief-Based Reasoning	Knowledge and Belief-Based Reasoning
All Students (<i>N</i> = 341)	2.23 (1.30)	.62 (.83)	1.12 (1.19)	1.76 (1.30)
Text Sidedness				
One-sided (<i>N</i> = 125)	2.62 (1.20)	.56 (.80)	.79 (1.06)	1.37 (1.20)
Two-sided Refutation (<i>N</i> = 109)	2.10 (1.28)	.57 (.77)	1.31 (1.18)	1.87 (1.29)
Two-sided Nonrefutation (<i>N</i> = 107)	1.90 (1.31)	.75 (.91)	1.33 (1.26)	2.09 (1.32)
Grade				
Six (<i>N</i> = 122)	2.25 (1.35)	.57 (.81)	1.13 (1.27)	1.71 (1.37)
Seven (<i>N</i> = 116)	2.23 (1.30)	.61 (.81)	1.14 (1.15)	1.73 (1.29)
Eight (<i>N</i> = 103)	2.18 (1.26)	.71 (.88)	1.10 (1.15)	1.83 (1.24)

Mean frequencies for Evaluative Reasoning by Class revealed that students in gifted and heterogeneous classes responded similarly by indicating that they used the evidence presented to evaluate the premise statements more often than using their prior knowledge or beliefs. In contrast, students in the inclusion-reading classes indicated that they used their beliefs or feelings to rate the premise statements more often than using the

evidence presented in the text and their prior knowledge (See Table 13). These results suggest that reading ability influences how middle-school students evaluate argument in persuasive text. Although students with the lowest reading ability used their prior knowledge as often as gifted-reading students, they relied far more on their beliefs and feelings when evaluating argument than did gifted readers.

Table 13. Mean Frequencies and Standard Deviations for the Evaluative Reasoning Measure (0-4) by Class.

	Evaluative Reasoning Selections			
	Evidence-Based Reasoning	Knowledge-Based Reasoning	Belief-Based Reasoning	Knowledge and Belief-Based Reasoning
All Students (<i>n</i> = 57)	2.07 (1.45)	0.58 (0.86)	1.30 (1.40)	1.88 (1.46)
Class				
Gifted (<i>n</i> = 19)	2.47 (1.47)	0.68 (.82)	0.84 (1.17)	1.53 (1.47)
Heterogeneous (<i>n</i> = 19)	2.27 (1.32)	0.39 (.92)	1.28 (1.18)	1.74 (1.28)
Inclusion (<i>n</i> = 19)	1.53 (1.47)	0.63 (0.83)	1.79 (1.55)	2.37 (1.57)

To evaluate how middle-school students' in the present study evaluated the premise statements, I conducted two separate 3 (Grade) x 3 (Text Sidedness) x 4 (Repeated Measure) mixed ANOVAs with grade and text sidedness as the between-subjects variables and premise statements as the within-subject variable with evaluative

reasoning selections as the dependent measures. Both mixed ANOVAs resulted in two statistically significant outcomes that address how middle-school students evaluated. Tables 14 and 16 present means and standard deviations for each variable. ANOVA results for main effects and interaction effects of grade and text sidedness on Evaluative Reasoning are presented in Tables 15 and 17.

First, the mixed ANOVA for evidence-basis ratings revealed a statistically significant main effect for Premise Statement, $F(1, 332) = 67.02, p < .01$, which suggests significant differences in mean evidence-basis ratings between premise statements. Mean evidence-basis ratings were higher for premise statements 1, 2 and 3 than mean evidence-basis ratings for premise statement 4 (See Table 14). The actual difference in mean evidence-basis ratings between premise statements was very large (Cohen, 1988). The effect size, calculated using partial eta squared, was .17. The results indicated that students used mostly evidence-based reasoning to evaluate the first three premise statements.

The mixed ANOVA for evidence-basis ratings also revealed a statistically significant main effect for Text Sidedness, $F(2, 332) = 10.00, p < .01$, which suggests significant differences in mean evidence-basis ratings between texts. Mean evidence-basis ratings were higher for the one-sided text than for the two-sided refutation text and the two-sided nonrefutation text (See Table 14). The actual difference in mean scores between texts was moderate (Cohen, 1988). The effect size, calculated using partial eta squared, was .06. Post-hoc comparisons (Tukey's HSD, $p < .05$) were statistically significant indicating that mean ratings for the one-sided text were significantly different than mean ratings for the two-sided refutation text and two-sided nonrefutation text. The

difference in mean ratings between the two-sided texts was not statistically significant. Differences between texts may have been due to the differences in the amount of emotional content included in each text, which I investigate in a later section.

Second, the mixed ANOVA for knowledge- and belief-based ratings revealed a statistically significant main effect for Premise Statement, $F(1, 336) = 48.87, p < .01$, which suggests significant differences between premise statements. Mean knowledge- and belief-basis ratings were higher for premise statement 4 than mean knowledge- and belief-basis ratings for premise statements 1, 2 and 3 (See Table 16). The actual difference in mean knowledge- and belief-basis ratings across premise statements was moderate to large (Cohen, 1988). The effect size, calculated using partial eta squared, was .13.

Students appeared to use reasoning that was mostly nontext-based for premise statement four which stated, “We don’t need zoos to learn about wild animals when we have TV and the Internet.” Verbal reports revealed that although students may have disagreed with keeping animals in zoos based on the evidence presented, they believed that animals should still be kept in zoos for other reasons. Verbal reasoning is illustrated in Chapter 5.

The mixed ANOVA for Knowledge- and Belief-basis ratings also revealed a statistically significant main effect for Text Sidedness, $F(2, 336) = 10.74, p < .01$, which suggests significant differences in mean knowledge- and belief-basis ratings between texts. Mean knowledge- and belief-basis ratings were lower for the one-sided text than for the two-sided texts (See Table 16). The actual difference in mean scores between texts was moderate (Cohen, 1988). The effect size, calculated using partial eta squared, was .06. Post-hoc comparisons (Tukey’s HSD, $p < .05$) were statistically significant indicating that mean ratings for the one-sided text were significantly different than mean

ratings for the two-sided refutation text and two-sided nonrefutation text. The difference in mean ratings between the two-sided texts was not statistically significant. Again, the amount of emotional content in each text may have influenced the impact of sidedness in students' premise evaluations.

Table 14. Means and Standard Deviations for Evidence-Basis Selections (0-1) by Premise Statements for Grade and Text Sidedness.

	Evidence-Basis Selections				Total
	Premise 1	Premise 2	Premise 3	Premise 4	
Grade					
Six	.58 (.50)	.66 (.48)	.64 (.48)	.38 (.49)	.56 (.37)
Seven	.60 (.49)	.70 (.46)	.58 (.50)	.35 (.48)	.56 (.32)
Eight	.62 (.49)	.66 (.48)	.58 (.50)	.32 (.47)	.55 (.32)
Text Sidedness					
One-sided	.76 (.43)	.72 (.45)	.67 (.47)	.46 (.50)	.65 (.30)
Two-sided refutation	.55 (.50)	.65 (.48)	.58 (.50)	.32 (.47)	.52 (.32)
Two-sided nonrefutation	.47 (.50)	.64 (.48)	.54 (.50)	.25 (.44)	.47 (.33)
Total	.60 (.49)	.67 (.47)	.60 (.49)	.35 (.48)	.56 (.32)

Table 15. Analysis of Variance Results for Main Effects and Interaction Effects of Grade and Text Sidedness on Evidence-Basis Selections.

Variable	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>
Between subjects				
Grade	2	.19	.09	.23
Text	2	8.12	4.06	10.00**
Grade * Text	4	.24	.06	.15
Error between	332	134.90	.41	
Within subjects				
Premise	1	11.22	11.22	67.02**
Premise * Grade	2	.31	.16	.94
Premise * Text	2	.12	.06	.35
Premise * Grade * Text	4	.10	.02	.14
Error within	332	55.57	.17	

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

Table 16. Means and Standard Deviations for Knowledge- and Belief-Basis Selections (0-1) by Premise Statements for Grade and Text Sidedness.

	Knowledge- and Belief-Basis Selections				
	Premise 1	Premise 2	Premise 3	Premise 4	Total
Grade					
Six	.42 (.50)	.34 (.48)	.36 (.48)	.57 (.50)	.42 (.34)
Seven	.40 (.49)	.30 (.46)	.42 (.50)	.62 (.49)	.44 (.32)
Eight	.40 (.49)	.34 (.48)	.41 (.49)	.67 (.47)	.45 (.31)
Text Sidedness					
One-sided	.25 (.43)	.28 (.45)	.33 (.47)	.50 (.50)	.34 (.29)
Two-sided refutation	.45 (.50)	.35 (.48)	.42 (.50)	.66 (.47)	.47 (.32)
Two-sided nonrefutation	.55 (.50)	.36 (.48)	.45 (.50)	.72 (.45)	.52 (.33)
Total	.41 (.49)	.33 (.47)	.39 (.49)	.62 (.49)	.44 (.32)

Table 17. Analysis of Variance Results for Main Effects and Interaction Effects of Grade and Text Sidedness on Knowledge- and Belief-Basis Selections.

Variable	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>
Between subjects				
Grade	2	.36	.18	.45
Text	2	8.55	4.28	10.74**
Grade * Text	4	.26	.06	.16
Error between	336	133.76	.40	
Within subjects				
Premise	1	8.52	8.52	48.87**
Premise * Grade	2	.46	.23	1.32
Premise * Text	2	.12	.06	.34
Premise * Grade * Text	4	.16	.04	.22
Error within	336	58.58	.17	

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

Changing Beliefs and Perceived Knowledge in Persuasive Text

Stein and Miller (1991, 1993) found that the developmental difference in decision making is the result of a difference in prior knowledge and experience. They argued that if the difference in prior knowledge is controlling the support for a particular position, then taking a stance in an argument and bringing evidence to bear on that position is a function of knowledge and beliefs about the domain of the argument, rather than a matter of development in argumentative skill. In the next section, I investigated middle-school students beliefs about zoos and rate their perceived knowledge relative to text sidedness and persuasive content and then examine the relationship of perceived knowledge and beliefs.

Belief Change

My fourth research question, *How convincing is persuasive text to middle-school readers relative to text sidedness?* was designed to determine how persuasive sidedness was at changing readers' initial beliefs about zoos. The Belief Change measure assessed participants' beliefs before and after reading one of three persuasive structures (e.g., one-sided, two-sided refutation, and two-sided nonrefutation) by asking them to rate how strongly they agreed or disagreed with four premises about zoos. I hypothesized that the one-sided persuasive text structure would be more successful in changing middle-school students' initial beliefs about zoos than either of the two-sided persuasive structures (Chambliss & Murphy, 2002; Buehl et al., 2001; Golder & Coirier, 1994; Murphy, 2001).

While research demonstrated that two-sided refutation was the most persuasive text among adults (Allen, 1991; Allen et al., 1990; Buehl et al., 2001; Hale et al., 1991; Murphy, 2001), Golder and Coirier (1994) found that many students between the ages of

10 and 16 did not recognize text containing complex argument structures, such as counterarguments and refutation, as argumentative as text that expressed only a viewpoint. In addition, Murphy (2001) found that many adults perceived the two-sided nonrefutation structure as informational and, therefore, not as persuasive. To evaluate how middle-school students' in the present study changed their beliefs after reading persuasive text, I conducted a 3 (Grade) x 3 (Text Sidedness) x 2 (Repeated Measure) mixed ANOVA with grade and text sidedness as the between-subjects variables and prereading and postreading belief ratings as the within-subject variable. This mixed ANOVA resulted in four statistically significant outcomes that address how convincing persuasive text was to middle-school students. Table 18 presents means and standard deviations for each variable. ANOVA results for main effects and interaction effects of grade and text sidedness on Belief Change are presented in Table 19.

First, the mixed ANOVA revealed a statistically significant main effect for Belief Change, $F(1, 344) = 304.32, p < .01$, which suggested significant differences in mean ratings from prereading to postreading. The actual difference in mean ratings from prereading to postreading was very large (Cohen, 1988). The effect size, calculated using partial eta squared, was .47. Mean postreading belief ratings were significantly higher than mean prereading belief ratings.

Second, the mixed ANOVA revealed a significant main effect for Text Sidedness, $F(2, 344) = 13.01, p < .01$, which suggested significant differences in mean belief ratings between texts. Mean ratings were higher for the one-sided text and the two-sided refutation text than for the two-sided nonrefutation text. The actual difference in mean scores between texts was moderate (Cohen, 1988). The effect size, calculated using

partial eta squared, was .07. Post-hoc comparisons (Tukey's HSD, $p < .05$) were statistically significant indicating that mean ratings for the one-sided and two-sided refutation texts were significantly different than mean ratings for the two-sided nonrefutation text. The difference in mean ratings between the one-sided and two-sided refutation texts was not statistically significant.

Third, the mixed ANOVA revealed a significant main effect for Grade, $F(2, 344) = 3.03$, $p < .05$, which suggested that there were significant differences between student ratings by grade. Sixth-grade students showed higher belief ratings than seventh-grade students or eighth-grade students. Despite reaching statistical significance, the actual difference in mean scores between the grades was quite small (Cohen, 1988) suggesting that the difference between the groups may be of little practical significance. The effect size, calculated using partial eta squared, was .02. Post-hoc comparisons using the Tukey HSD test ($p < .05$) indicated that the mean scores were not significantly different between pairs of grade levels.

Finally, the mixed ANOVA revealed a statistically significant Belief Change by Text Sidedness interaction, $F(2, 344) = 30.18$, $p < .01$, which suggested that differences in mean ratings from prereading to postreading were not the same across texts. Means for belief ratings for all students were relatively equal before reading. However, the means for belief ratings after reading showed considerable differences between the three texts. The line graph in Figure 7 shows this interaction.

Table 18. Means and Standard Deviations for Belief Ratings (0-130) Before and After Reading for Grade and Text Sidedness.

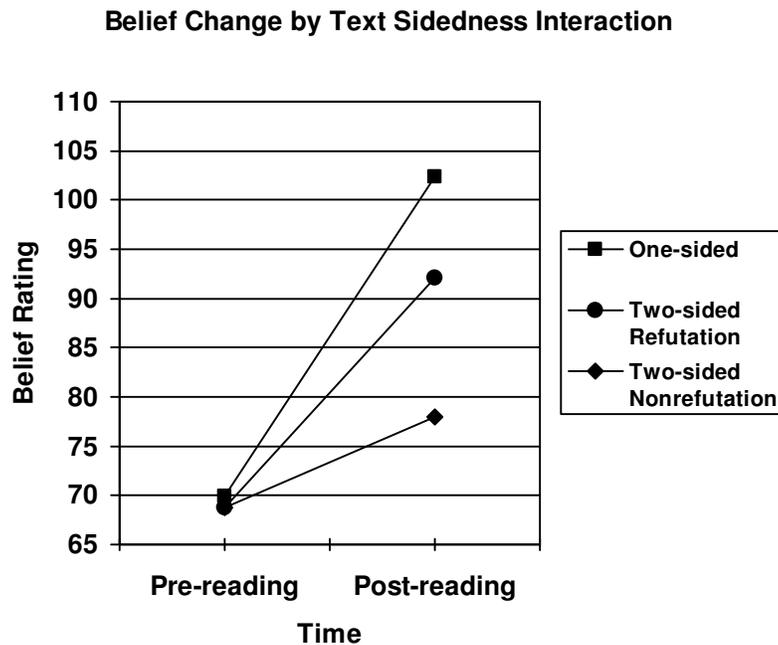
	Belief Rating		
	Before Reading	After Reading	Total
Grade			
Six	71.69 (21.63)	94.49 (26.60)	83.09 (20.50)
Seven	67.07 (18.81)	87.43 (25.53)	77.24 (18.96)
Eight	68.71 (21.62)	92.79 (27.07)	80.75 (21.04)
Text Sidedness			
One-sided	69.92 (20.67)	102.32 (24.52)	86.12 (18.71)
Two-sided refutation	68.81 (20.62)	92.12 (26.50)	80.47 (20.58)
Two-sided nonrefutation	68.76 (21.07)	77.94 (22.78)	73.44 (19.65)
Total	69.21 (20.73)	91.55 (26.48)	80.38 (20.24)

Table 19. Analysis of Variance Results for Main Effects and Interaction Effects of Grade and Text Sidedness on Belief Change.

Variable	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>
Between subjects				
Grade	2	4723.45	2361.73	3.07*
Text	2	19,980.14	9,990.07	13.01**
Grade * Text	4	214.60	53.65	0.07
Error between	344	264,152.60	767.89	
Within subjects				
Belief Change	1	80,567.88	80,567.88	304.32**
Belief Change * Grade	2	454.63	227.32	0.86
Belief Change * Text	2	15,980.97	7,990.48	30.18**
Belief Change * Grade * Text	4	2198.93	549.73	2.08
Error within	344	91,074.18	264.75	

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

Figure 7. Belief Change by Text Sidedness Interaction.



Whereas all students rated their initial beliefs similarly before reading each text, postreading beliefs increased toward the advocated claim more dramatically after reading the one-sided text, then the two-sided refutation text, and finally the two-sided nonrefutation text. These findings suggest that among middle-school students, presenting one side of an issue may be more persuasive than text containing refutation. However, these results were also impacted by differences in the amount of emotional information included in each text. A closer look at how the emotional content of these texts affected readers' beliefs in the next facet of the study may help to further demonstrate the persuasive nature of these texts among middle-school students.

To evaluate how middle-school students' in the class sample changed their beliefs after reading persuasive text, I conducted a 3 (Class) x 2 (Repeated Measure) mixed ANOVA with class as the between-subjects variable and prereading and postreading

belief ratings as the within-subject variable. This mixed ANOVA resulted in one statistically significant outcome, a main effect for Belief Change, $F(1, 54) = 33.16, p < .01$, which suggested significant differences in mean ratings from prereading to postreading. The actual difference in mean ratings from prereading to postreading was very large (Cohen, 1988). The effect size, calculated using partial eta squared, was .38. Mean postreading belief ratings were significantly higher than mean prereading belief ratings, a finding which was consistent with large group results. There was no significant difference in belief change by class suggesting that reading ability level did not influence students' beliefs after reading persuasive text. Table 20 presents means and standard deviations for each variable. ANOVA results for main effects and interaction effects of class on belief change are presented in Table 21.

Table 20. Means and Standard Deviations for Belief Ratings (0-130) Before and After Reading for Class.

	Belief Rating		
	Before Reading	After Reading	Total
Class			
Gifted	65.41 (23.76)	93.40 (28.38)	79.40 (20.75)
Heterogeneous	76.65 (20.77)	93.53 (28.76)	85.08 (22.31)
Inclusion	78.63 (21.97)	95.07 (30.82)	86.85 (23.74)
Total	73.56 (22.58)	94.00 (28.82)	83.78 (22.13)

Table 21. Analysis of Variance Results for Main Effects and Interaction Effects of Class on Belief Change.

Variable	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>
Between subjects				
Class	2	1151.94	575.97	0.58
Error between	54	53713.62	994.70	
Within subjects				
Belief Change	1	11902.93	11902.93	33.16**
Belief Change * Class	2	813.30	406.65	1.13
Error within	54	19380.90	358.91	

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

Content-Specific Belief Change

My fifth research question, *How convincing is the content of persuasive text to middle-school readers?* was designed to assess the persuasiveness of two types of content authors use in persuasion. The Content-Specific Belief Change measure assessed participants' belief change after reading specific paragraphs within each text. Students rated how much their mind changed after reading each of four specific paragraphs, two containing emotionally appealing evidence and two containing factual evidence. Given their unfamiliarity with persuasive techniques, such as emotional appeals, I hypothesized that middle-school readers would be more readily influenced by emotionally appealing content than multiple forms of factual evidence, particularly in the one-sided text which elaborated more on instances of animal abuse (Alexander et al., 2001; Murphy, 2001).

Based on Murphy's (2001) research in text persuasiveness, adults rated articles as highly persuasive when emotional appeals and various forms of supporting evidence were present and rated articles as least persuasive when they relied heavily on scientific evidence and no emotional appeals. To evaluate the persuasiveness of emotionally appealing evidence versus factual evidence, I conducted a 3 (Grade) x 3 (Text Sidedness) x 2 (Persuasive Content) mixed ANOVA with grade and text sidedness as the between-subjects variables and repeated measure as the within-subject variable using Content-Specific Belief ratings as the dependent measure. The mixed ANOVA resulted in two statistically significant outcomes. Table 22 presents means and standard deviations for each variable. ANOVA results for main effects of grade and text sidedness on Content-Specific Beliefs are presented in Table 23.

The mixed ANOVA revealed a significant main effect for Content-Specific Beliefs, $F(1, 344) = 61.98, p < .01$, and a main effect for text sidedness, $F(2, 344) = 7.04, p < .01$. Text sidedness and content type did not interact. The main effect for content-specific belief change suggested that there was a meaningful difference in beliefs after reading factual evidence compared to emotionally appealing evidence presented by the author. Mean emotional content ratings were higher than mean factual content ratings (See Table 11). The actual difference in mean ratings between factual content and emotional content was large (Cohen, 1988). The effect size, calculated using partial eta squared, was .15. Overall, middle-school students appeared to change their beliefs considerably more after reading emotional content than after reading factual content.

Table 22. Means and Standard Deviations for Content-Specific Belief Ratings (0-130) During Reading for Grade and Text Sidedness.

	Content-Specific Belief Ratings		
	Factual Content	Emotional Content	Total
Grade			
Six	68.78 (36.22)	82.06 (40.41)	75.42 (36.33)
Seven	68.06 (32.27)	75.58 (36.76)	71.82 (32.73)
Eight	69.60 (35.09)	82.85 (45.32)	76.22 (37.18)
Text Sidedness			
One-sided	75.04 (35.44)	90.07 (39.69)	82.60 (34.78)
Two-sided refutation	68.32 (34.43)	78.07 (40.22)	73.20 (13.51)
Two-sided nonrefutation	61.68 (32.09)	70.16 (40.36)	65.92 (33.96)
Total	68.78 (34.46)	80.06 (40.81)	74.42 (35.35)

The main effect for text sidedness suggested that there was a meaningful difference in content-specific beliefs between texts. Students' mean belief ratings as they read across both types of content were higher for the one sided text than for the two-sided refutation and the two-sided nonrefutation text. The actual difference in mean scores between texts was small (Cohen, 1988) suggesting that the difference between the groups may be of little practical significance. The effect size, calculated using partial eta squared, was .04. Post-hoc comparisons using the Tukey HSD test ($p < .05$) indicated that the mean scores were significantly different between the one-sided and two-sided nonrefutation texts. There was no significant difference in mean scores between the one-

sided and two-sided refutation text. The emotional content in the one-sided text and the two-sided refutation text was found to be more highly successful at changing middle-school readers' beliefs than the emotional content mentioned in the balanced argument structure of the two-sided nonrefutation text. This difference between texts was probably impacted by the difference in how much the emotional content was elaborated within each text. Recall that emotional content was significantly more convincing than factual content. Using the same number of words, the one-sided text elaborated more on instances of animal abuse, whereas the two-sided texts either refuted counterclaims or presented the other side of the issue. Thus, it is impossible to know whether any effects among the text types are the result of text sidedness or emotional content. Structure and content are confounded.

To evaluate how middle-school students' in the class sample changed their beliefs relative to persuasive content, I conducted a 3 (Class) x 2 (Repeated Measure) mixed ANOVA with class as the between-subject variable and content-specific belief ratings as the within-subjects variable. This mixed ANOVA resulted in no statistically significant outcomes. Table 24 presents means and standard deviations for each variable. ANOVA results for main effects and interaction effects of Class on Content-specific Belief Change are presented in Table 25.

Table 23. Analysis of Variance Results for Main Effects and Interaction Effects of Persuasive Content on Belief Change During Reading by Text Sidedness and Grade.

Variable	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>
Between subjects				
Grade	2	2699.64	1349.82	0.55
Text	2	34,302.07	17,151.04	7.04**
Grade * Text	4	4264.52	1066.13	0.44
Error between	344	838,652.01	2437.94	
Within subjects				
Content Type	1	21,779.35	21,779.35	61.98**
Content Type * Grade	2	1434.35	717.18	2.04
Content Type * Text	2	1482.64	741.32	2.11
Content Type * Grade * Text	4	810.54	202.63	0.58
Error within	344	120,875.69	351.38	

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

Table 24. Means and Standard Deviations for Content Specific Belief Ratings (0-130) During Reading for Class.

	Content Specific Belief Ratings		
	Factual Content	Emotional Content	Total
Class			
Gifted	63.05 (41.16)	64.67 (46.33)	63.86 (42.07)
Heterogeneous	59.08 (34.42)	65.55 (44.02)	62.32 (32.28)
Inclusion	66.16 (35.34)	73.79 (43.76)	69.97 (35.38)
Total	62.76 (36.54)	68.00 (44.11)	65.38 (38.12)

This ANOVA revealed no main effect for class, suggesting that reading ability did not influence students' content-specific beliefs in persuasive text. Furthermore, the results revealed no main effect for content-specific belief change suggesting that the persuasive content did not influence students' belief in the class sample. These results were not consistent with large group results which revealed a significant difference in content-specific belief change during reading.

Table 25. Analysis of Variance Results for Main Effects and Interaction Effects of Persuasive Content on Belief Change During Reading by Class.

Variable	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>
Between subjects				
Class	2	1246.25	623.13	0.21
Error between	54	161543.68	2991.55	
Within subjects				
Content Type	1	782.91	782.91	2.04
Content Type * Class	2	193.40	96.70	0.25
Error within	54	20748.79	384.24	

The large group data analyses showed that the content of persuasive text influences middle-school readers' beliefs on the issue at hand. In the next section I investigate the influence of sidedness on middle-school students' perceived knowledge.

Perceived Knowledge Change

My sixth question, *What is the impact of sidedness on middle-school readers' perceived knowledge?* was designed to investigate how effective sidedness was in

changing readers' perceived knowledge. The Perceived Knowledge Change measure assessed participants' level of perceived knowledge before and after reading one of three persuasive texts. I asked participants to rate how much they thought they knew about keeping animals in zoos. I hypothesized that two-sided nonrefutation would be more successful in changing middle-school students' perceived knowledge about zoos (Buehl et al., 2001).

I conducted a 3 (Grade) x 3 (Text Sidedness) x 2 (Repeated Measure) mixed ANOVA with grade and text sidedness as the between-subjects variables and repeated measure as the within-subject variable using prereading and postreading Perceived Knowledge ratings as the dependent measure to evaluate change in middle-school students' perceived knowledge. The mixed ANOVA resulted in three statistically significant outcomes that addressed how effective the three texts were in changing students' perceived knowledge. Table 26 presents means and standard deviations for each variable. ANOVA results for main effects and interaction effects of grade and text sidedness on Perceived Knowledge are presented in Table 27.

First, there was a statistically significant main effect for Perceived Knowledge, $F(1, 346) = 358.18, p < .01$, which suggested that there was a difference in mean ratings from prereading to postreading. Mean postreading perceived knowledge ratings were significantly higher than mean prereading perceived knowledge ratings. The actual difference in mean ratings from prereading to postreading was very large (Cohen, 1988). The effect size, calculated using partial eta squared, was .50.

Table 26. Means and Standard Deviations for Knowledge Ratings (0-130) Before and After Reading for Grade and Text Sidedness.

	Perceived Knowledge Rating		
	Before Reading	After Reading	Total
Grade			
Six	70.88 (25.02)	101.00 (19.66)	85.94 (18.45)
Seven	75.27 (22.59)	100.76 (21.42)	88.02 (18.50)
Eight	74.88 (24.91)	100.65 (20.01)	87.76 (16.76)
Text Sidedness			
One-sided	75.17 (25.82)	106.01 (18.73)	90.59 (17.74)
Two-sided refutation	70.17 (22.44)	98.51 (20.88)	84.34 (17.42)
Two-sided nonrefutation	75.18 (23.75)	96.96 (20.49)	86.07 (18.23)
Total	73.59 (24.19)	100.82 (20.33)	87.20 (17.95)

Second, the mixed ANOVA revealed a significant main effect for Text Sidedness, $F(2, 346) = 3.79, p < .05$, that suggested a difference in mean ratings between texts. Mean perceived knowledge ratings were higher for the one-sided text and the two-sided nonrefutation text than for the two-sided refutation text. The actual difference in mean scores between texts was small (Cohen, 1988) suggesting that the difference between the texts may be of little practical significance. The effect size, calculated using partial eta squared, was .02. Post-hoc comparisons (Tukey's HSD, $p < .05$) were statistically significant indicating that mean knowledge ratings for the one-sided and two-sided nonrefutation texts were significantly different than mean ratings for the two-sided refutation text. The difference in mean ratings between the one-sided and two-sided nonrefutation texts was not statistically significant. This particular main effect was

probably due to the higher rating students reading the nonrefutation text gave to their before-reading perceived knowledge causing the average perceived knowledge rating to look higher than the case might be for the nonrefutation text.

Table 27. Analysis of Variance Results for Main Effects and Interaction Effects of Grade and Text Sidedness on Perceived Knowledge Change.

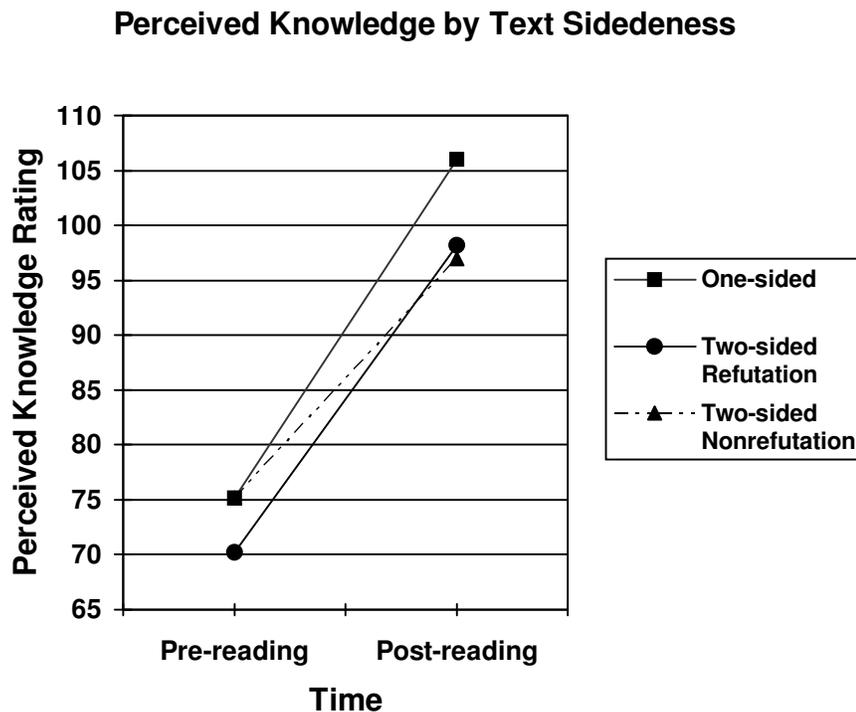
Variable	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>
Between subjects				
Grade	2	357.22	178.61	0.28
Text	2	4852.70	2426.35	3.79*
Grade * Text	4	827.01	206.75	0.32
Error between	346	221,765.36	640.94	
Within subjects				
Perceived Knowledge	1	125,680.97	125,680.97	358.18**
Perceived Knowledge * Grade	2	906.13	453.06	1.29
Perceived Knowledge * Text	2	2708.00	1354.00	3.86*
Perceived Knowledge * Grade * Text	4	460.70	115.18	0.33
Error within	346	121,405.91	350.88	

• $p < .05$, ** $p < .01$

Finally, the mixed ANOVA revealed a statistically significant Perceived Knowledge change by Text interaction, $F(2, 346) = 3.86, p < .05$, which suggested that changes in perceived knowledge from prereading to postreading were not the same between texts. Means for perceived knowledge ratings for all students were relatively

similar before reading. However, the means after reading showed a considerable difference between texts. The line graph in Figure 8 shows this interaction. Whereas all students rated their initial perceived knowledge similarly before reading, postreading perceived knowledge ratings rose to the highest level after reading the one-sided text. It appeared that the middle-school students who read the one-sided and two-sided refutation texts perceived to gain more knowledge than those students who read the two-sided nonrefutation text. This finding is not consistent with what Buehl et al. (2001) found where adults had significantly more perceived and demonstrated knowledge after reading two-sided nonrefutation than after reading one-sided text.

Figure 8. Perceived Knowledge Change by Text Sidedness Interaction



To evaluate how middle-school students' in the class sample changed their perceived knowledge, I conducted a 3 (Class) x 2 (Repeated Measure) mixed ANOVA

with class as the between-subjects variable and prereading and postreading perceived knowledge ratings as the within-subject variable. This mixed ANOVA resulted in one statistically significant outcome. Table 28 presents means and standard deviations for each variable. ANOVA results for main effects and interaction effects of Class on Perceived Knowledge change are presented in Table 29.

The mixed ANOVA for Class revealed a statistically significant main effect for Perceived Knowledge Change, $F(1, 54) = 83.10, p < .01$, which suggests significant differences in mean ratings from prereading to postreading. The actual difference in mean ratings from prereading to postreading was very large (Cohen, 1988). The effect size, calculated using partial eta squared, was .61. Mean postreading perceived knowledge ratings were higher than mean prereading perceived knowledge ratings. These results are consistent with large group results. There was no significant difference in perceived knowledge change by class suggesting that reading ability did not influence students' perceived knowledge change in persuasive text.

Table 28. Means and Standard Deviations for Perceived Knowledge Ratings (0-130) Before and After Reading for Class.

	Perceived Knowledge Ratings		
	Before Reading	After Reading	Total
Class			
Gifted	72.33 (20.96)	99.78 (19.93)	86.05 (17.28)
Heterogeneous	65.42 (21.07)	97.22 (20.74)	81.32 (17.58)
Inclusion	69.78 (30.63)	104.86 (25.41)	87.32 (23.03)
Total	69.18 (24.36)	100.62 (21.99)	84.90 (19.30)

Table 29. Analysis of Variance Results for Main Effects and Interaction Effects on Perceived Knowledge Change by Class.

Variable	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>
Between subjects				
Class	2	760.11	380.06	0.50
Error between	54	40972.45	758.75	
Within subjects				
Perceived Knowledge	1	28178.42	28178.42	83.10**
Perceived Knowledge * Class	2	277.93	138.96	0.41
Error within	54	18309.98	339.07	

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

The results of the Perceived Knowledge change investigations revealed that perceived knowledge ratings increased significantly from prereading to postreading in persuasive text, particularly after reading the one-sided and two-sided refutation texts. In the next section, I analyzed the relationship between students' prereading and postreading perceived knowledge and their beliefs in persuasive text.

Beliefs Relative to Perceived Knowledge

My seventh research question, *What is the relationship between perceived knowledge to belief change?* was designed to determine if perceived knowledge relates to changes in students' beliefs. I hypothesized that perceived knowledge would be associated with belief change (Alexander et al., 2001; Buehl et al., 2001).

Researchers have found that among adults reading contentious argument structured as two-sided refutation containing emotional appeals, perceived knowledge and beliefs were significantly positively correlated at prereading and postreading

(Alexander et al., 2001). To analyze the relationship between perceived knowledge and beliefs among middle-school students reading persuasive text, I used Pearson product-moment correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity and homoscedasticity. Correlation coefficients revealed a significant, small positive correlation between postreading perceived knowledge and postreading beliefs ($r = .26$, $n = 353$, $p < .01$), with postreading perceived knowledge levels related to levels of postreading belief. Prereading perceived knowledge among middle-school students was not related to prereading beliefs, content-specific beliefs, or postreading beliefs about zoos.

Summary: Changing Beliefs and Perceived Knowledge in Persuasive Text

The results of the Belief Change investigation revealed that mean postreading belief ratings were significantly higher than mean prereading belief ratings. In addition, the results varied by text sidedness. Whereas all students rated their initial beliefs similarly before reading each text, postreading beliefs increased toward the advocated claim more dramatically after reading the one-sided text, then the two-sided refutation text, and finally the two-sided nonrefutation text. Consequently my third hypothesis, that one-sided persuasive text structure would be more successful in changing middle-school students' initial beliefs about zoos than either of the two-sided persuasive structures, was tentatively supported by the results of this investigation. Middle-school students seem to respond differently than adults to the persuasiveness of text sidedness. Adults found two-sided refutation to be the most persuasive text structure whereas middle-school students found the one-sided text to be most persuasive. The present finding seems to support Goldier and Coirier's (1994) hypothesis that middle-school-age students expect "truly

argumentative” text to express certainty rather than negotiation consisting of counterarguments. However, differences in the amount of emotional content may have impacted the influence of text sidedness.

The results of the Content-Specific Belief Change investigation revealed that there was a meaningful difference in beliefs after reading factual evidence compared to emotionally appealing evidence presented by the author and that this difference was large. Mean emotional content ratings were significantly higher than mean factual content ratings. Consequently, my fourth hypothesis that middle-school readers would find emotionally appealing content more convincing than factual evidence was supported by the results. The emotional content in the one-sided text and the two-sided refutation text was found to be more highly successful at changing middle-school readers’ beliefs than the emotional content mentioned in the balanced argument structure of the two-sided nonrefutation text. However, structure and content were confounded.

The results of the Perceived Knowledge Change investigation revealed that mean postreading knowledge ratings were significantly higher than mean prereading knowledge ratings and that the actual difference in mean ratings from prereading to postreading was very large. Overall, these persuasive texts seemed to be very effective at changing readers’ perceived knowledge. A statistically significant Perceived Knowledge change by Text interaction revealed that all students rated their initial perceived knowledge similarly before reading, but postreading perceived knowledge ratings rose to the highest level after reading the one-sided text, then the two-sided refutation text, and finally the two-sided nonrefutation text. As a result, my fifth hypothesis that the two-sided nonrefutation text structure would be more successful in changing middle-school

students' perceived knowledge about zoos was not supported. It seemed that argumentative text that expresses certainty, rather than negotiation consisting of counterarguments or the presentation of both sides of an issue, may have impacted the perceived knowledge of middle-school students as well as their beliefs. Structure and content were confounded. The amount of emotional content contained in each text may have impacted students' perceived knowledge. It seemed that the more the emotional content the higher the perceived knowledge ratings. Recall that emotional content was significantly more convincing than factual content. Using the same number of words, the one-sided text elaborated more on instances of animal abuse, whereas the two-sided texts either refuted counterclaims or presented the other side of the issue. Thus, it is impossible to know whether any effects among the text types are the result of text sidedness or emotional content.

Finally, the results of the correlation investigation revealed a significant, small positive correlation between postreading perceived knowledge and postreading beliefs, with postreading perceived knowledge levels related to levels of postreading belief. Prereading perceived knowledge among middle-school students was not related to prereading beliefs, content-specific beliefs, or postreading beliefs about zoos. Thus, my sixth hypothesis that perceived knowledge would relate to beliefs was partially supported. It seems that the more knowledge middle-school students perceived to gain, the more their beliefs rose toward the author's advocated view.

Summary

This chapter reported the quantitative results of the first three facets of the study, *Comprehending Written Argument in Persuasive Text, Evaluating Argument in*

Persuasive Text, and Changing Beliefs and Perceived Knowledge in Persuasive Text. In Chapter 5, I will describe and illustrate middle-school students' verbal reports relative to comprehending and evaluating argument structures in persuasive text. Chapter 5 reveals the thought processes of middle-school students as they read, as they identified the author's purpose and argument, and as they evaluated the evidence presented.

Chapter 5: Verbal Protocol Results

In this facet of the study, I attempt to answer research question eight, *How do middle-school readers process persuasive text?* by describing the processes that were evident in verbal protocol responses during and after reading persuasive text. First, I describe what processes were evident in verbal protocol responses during reading in the section, *Online Reading Processes in Persuasive Text*. Then, I describe processes that were evident in verbal protocol responses after reading as they analyzed the author's purpose and argument in the sections, *Postreading Processes: Identifying the Author's Purpose* and *Postreading Processes: Identifying the Author's Argument*. Finally, I describe the processes that were evident in verbal protocol responses as students evaluated premises after reading persuasive text in the section, *Postreading Processes: Evaluating Argument*.

Use of the term "postreading" throughout this chapter does not indicate that the reading process has ended. In fact, one way of thinking about the reading process is that reading begins when the reader starts thinking about the topic and continues until the reader is finished thinking about the topic. For ease of writing, I divide the reading process into three parts: (a) prereading, (b) during reading or online reading, and (c) after reading or postreading. In using these terms, I do not attempt to draw lines between the beginning and end points in the reading process. In the present study, students continued to think about what they read during postreading tasks. Thus, by using the term "postreading," I am not making reference to the end of the reading process where the reader is finished thinking about the topic. When used, this term refers to the period of

time where students are completing comprehension questions, ratings, and evaluating premise statements.

Online Reading Processes in Persuasive Text

The Online Processes measure assessed verbal protocol participants' thought processes while reading one persuasive text. I asked verbal protocol participants to report on what they were thinking as they read while I audio recorded responses and recorded notes. After I transcribed all responses and cross-checked recordings with my notes, I developed a coding system for analysis based on Bogdan and Biklen's (2003) approach as I described in Chapter 3. In the following sections, I describe the most common processes that emerged from students' online verbal reports and take account of typical responses to further illustrate students' thought processes.

Online Evaluating Processes

The most common process evident in verbal protocol students responses during reading was evaluating. Pressley and Afflerbach (1995) found that expert readers evaluate the style and content of the text as they read. The verbal protocol students in the present study, on the other hand, focused solely on evaluating the content of the text during reading. Of the many evaluative processes described by Pressley and Afflerbach as occurring among expert readers, the verbal protocol students in the present study showed the most evidence of one: showing approval or disapproval of the content by stating that they agreed or disagreed with the author. In addition, verbal protocol students typically evaluated the content of the text they were reading by stating personal opinion and by suggesting alternatives to the situations presented.

A majority of verbal protocol students' evaluative processes showed approval or disapproval of the content in the text. Students evaluated what was happening in the text by stating whether they agreed or disagreed with what they read, or whether they thought or believed it was right or wrong, bad or good, and true or false. Student 1 gave a typical evaluative response expressing disapproval of the feed-animal situation and agreement with the author while reading the one-sided text.

S1: “**I don’t think it’s right** just to kill them and sell them to other zoos just because they don’t want them anymore....**I agree with the author** that we shouldn’t put animals in cages if we could just click on the Internet and watch TV as much as we do that in America.”

The second most common evaluative process evidenced by almost every protocol student was suggesting alternatives to the situations in the text. Student 15 gave a typical response suggesting an alternative to keeping animals confined to small areas where they have little opportunity for exercise, for socializing, and for hunting, but have plenty of opportunity to become bored. The words in bold indicate the student’s suggestion.

S15 “For zoos, maybe **they should have an open area that’s somewhat closed off but pretty big with plants and wildlife in there so that they can run around and actually do something** instead of just sitting in a cage.”

The third most prevalent evaluative process evidenced by verbal protocol students was stating personal opinion regarding the content of the text they were reading. Student 1 gave a typical response among verbal protocol students by stating his opinion of raising and killing feed animals in zoos.

S1 **“It’s kind of cruel to put an animal in a plastic bag and slam it against a hard surface to kill it just to give one animal something to eat, which is barely any food.”**

Expressing agreement or disagreement, suggesting alternatives, and stating personal opinion were the typical thought processes of verbal protocol students while reading persuasive text. Whereas protocol students most often evaluated the content of the text they were reading, they interpreted what they were reading almost as frequently.

Online Interpreting Processes

Verbal protocol students reported a variety of interpreting processes located in the literature on good-reader comprehension. Chambliss (1995) described at least two text processes advanced seniors used to get the gist of lengthy written argument: macroprocessing and the structure strategy. Macroprocessing involves inducing the main idea of a text based on the details or patterns presented in the text. The structure strategy involves using knowledge of the argument structure to identify the main point and supporting evidence. Chambliss and Murphy (2002) found fourth and fifth graders to use versions of the same two processes, one of which was the topic strategy. The topic strategy involves inducing a general topic that subsumes the details in the text.

In addition, Pressley and Afflerbach (1995) described 12 categories of interpretive processes adult expert readers used to construct meaning from text.

1. Paraphrasing parts of text into more familiar terms
2. Visualizing concepts, relations, emotions specified in (inferable from) a text
3. Identifying “symbols” or “symbolic language” and translating the meaning of the symbols

4. Instantiating prior knowledge schemata that are activated by information in the text
5. Empathizing with messages in the text
6. Making claims about “what the author really wanted to say” instead of what he or she actually said
7. Constructing interpretive conclusions
8. Constructing interpretive categorizations
9. Physically or mentally doing what the text instructs and then confirming the expected outcome
10. Constructing alternative interpretations of what is going on in the story
11. Constructing alternative perspectives on a story from the perspectives of different characters in the take
12. Pretending to deliberate with others while reading the text. (p.55-57)

However, verbal protocol responses in the present study typically showed evidence of three interpreting processes: (a) paraphrasing, (b) activating prior knowledge, and (c) empathizing with the message.

Verbal protocol students appeared to engage to the greatest extent in paraphrasing parts of the text into more familiar terms. For instance, most verbal protocol students paraphrased what the author was saying in their own words, reflecting their understanding of the content presented. Student 19 gave a typical response using paraphrasing to interpret regulated breeding in paragraph four of the one-sided text.

Text 1: “Zoo animals also suffer from not being able to socialize with other animals. For example, zoos do not allow animals to mate naturally,

controlling carefully how they breed. And many animals who live in large herds or family groups in nature are kept alone or, at most, in pairs. As a result, zoo animals cannot take part in normal, social activities.”

S19: “In a way **the zoo kind of takes their social life away because they don’t let them mate naturally and they control their breeding...**”

Verbal protocol students engaged to a lesser extent in activating prior knowledge from information in the text. Typical responses involved students remembering what they had seen or experienced in zoos, on television, or in the movies as they read the text, using their knowledge to interpret and verify the information read. Student 7 gave a typical response indicating what he remembered seeing on TV and in zoos.

S7: “**I’m thinking what you see on TV and in zoos**, they are in small areas....When I read the first two sentences **I thought of the movie Madagascar and how they were shipped on a big boat back to their habitat.**”

Similarly, verbal protocol students engaged to a lesser extent in empathizing with the zoo animals and their circumstances referred to in the text. Student 5 gave a typical response of empathizing with zoo animals.

S5: “Stuck in a little zoo, I mean **I’d get just like the gorillas**. They get kind of mad and mean and meaner by being in there because they have nothing to do. **I would get mean too.**”

Whereas verbal protocol students reported interpreting the text, they rarely engaged in macroprocessing or the structure strategy (Chambliss, 1995; Chambliss & Murphy, 2002) to make sense of the argument in the text they had read. When verbal protocol students

were not evaluating or interpreting the text at hand, they were restating the text or making inferences.

Restating Text and Inference-Making

Verbal protocol students typically engaged in restating text and inference making though not to the extent they evaluated and interpreted what they were reading. Verbal protocol students often restated parts of the text read, but they did so a majority of the time to explain their interpretations and not merely to repeat what was written in the text. Student 2 provided a typical response involving restating the text to explain an idea.

S2: **“It even says here that it’s a little better for them because they get more food [the idea being explained]. They feed better, they live longer lives, and they’re healthier [restated text].”**

Verbal protocol students typically made inferences as they read, adding to the text what they already knew about zoos. Student 4 responded with an inference regarding why zoos might be considered cruel to animals.

S4: **“I think that sometimes the zoos could be cruel because they don’t attempt to make their lives like they normally do. But with all the people around the tigers and other animals, they’re not used to having people around them, so when they see people coming to stare at them they’re harming the animals.”**

So far, I have described the typical processes verbal protocol students engaged in during reading to comprehend the persuasive text at hand and illustrated their use. Although verbal protocol students’ thought processes typically made use of these particular reading processes, various students also engaged in drawing conclusions,

monitoring, and so forth, though much less frequently. Furthermore, their reading processes did not occur as isolated events but in a more interwoven fashion. By including examples of students' complete thought processes, I hope to illustrate how reading proceeded in a connected manner with the text they were reading.

Connected Processing During Reading

The reading processes that I categorized for analysis occurred in a connected fashion in each text. For instance, Student 7 evaluated text content (**Ev**), empathized with the animals (**Em**), restated parts of the text to explain (**R**), paraphrased (**P**), and monitored (**M**) his understanding while reading paragraph two in the one-sided text.

Text 1: "Kept in cramped areas, zoo animals cannot move around freely. A dolphin in the ocean, for example, travels fifty miles a day. That's the same as five hundred laps around a typical marine zoo pool. According to animal supporter, Jeffrey Masson, dolphins and whales are animals that normally live in the entire ocean. To confine them in marine zoos where space is very limited is, basically, to put them in prison. Land animals, most of whom are used to running great distances, also suffer from being confined. Birds' wings may be clipped so that they cannot fly. Because captive animals cannot move around freely, they don't get the exercise they need."

S7: "It's not good (**Ev**). The animals get bored (**P**) and stuff. Dolphins and whales must feel really cramped (**Em**) because if they lived in the whole ocean and then get put in a pool it must be kind of like being put in prison (**R**). It's a good point that it's kind of like putting them 'in prison

(E_v).’ The birds’ wings get clipped (R). That must really feel like the birds are like in prison (E_m). From what I read so far it does seem like the animals don’t get the exercise they need (M).”

Student 16 evaluated the content (E_v), paraphrased (P), restated text (R) to explain, and made an inference (Inf) while reading paragraphs four and five in the two-sided refutation text.

Text 2: “Even the most “natural” zoo exhibits fail to provide the most important element of nature: Zoo animals do not hunt for their food. Writer, Jared Diamond, summarizes how this affects animals’ lives: In the wild, animals spend most of their time on food: searching for it, capturing it, processing it, and eating it, often in many small amounts at many different places...In zoos, though, food traditionally consists of prepared chow that requires no capturing or processing, placed in a pan that requires no finding, and provided once a day. The animal gobbles down the chow in 5 minutes, leaving it 23 hours and 55 minutes a day to be bored. Because zoo animals cannot exercise, hunt for food, or socialize with other animals, they spend their time pacing back and forth and develop abnormal, self-destructive behaviors, or “zoochosis.” For example, captive gorillas often vomit and reswallow their food. They may also eat their feces, become abnormally aggressive, or groom themselves far more than any wild animal would.”

S16: “I also agree that an animal’s instinct is to hunt for their food (E_v) and when they’re in the zoo they don’t have to hunt for their food (R). They’re just given it (P), which I think is something they shouldn’t be doing (E_v),

but they do need to be fed and they can't hunt for their food so **(Ev)**....I think that the food that they give them, they should like put them in different places and they'll be able to hunt for their food and will give them something to do **(Ev)**...I think they should also give the animals more to do **(Ev)**. It says captive gorillas vomit and reswallow their food **(R)**. They must not have much to do if they have to do that **(Inf)**."

Similarly, Student 4 displayed the interwoven processes of interpreting the text using empathizing **(Em)**, evaluating **(Ev)**, restating content **(R)** to explain, and making inferences **(Inf)** while reading the two-sided nonrefutation text.

Text 3: "PETA has a different view pointing out that zoo animals suffer because their natural needs are rarely met. For example, birds' wings may be clipped so that they cannot fly. Aquatic zoo animals, like dolphins and whales, are often without enough water to move freely. Many aquatic and land animals who live in large herds or family groups in nature are kept alone or in pairs in zoos. Their natural hunting and mating behaviors have been replaced by regulated feeding and breeding schedules so that zoo animals cannot hunt and mate naturally. Because zoo animals are kept in small areas where their natural needs cannot be met, they often develop abnormal and self-destructive behaviors, or "zoochosis."

S4: "I believe that what PETA is saying is true **(Ev)** because they're saying that zoos might clip the birds wings off so that they cannot fly **(R)** and dolphins and whales, [they] don't give them enough water to move freely **(R)** and they have mating schedules **(R)**. So I don't think that is fair to the

animals (**Ev**), but I can understand why they have to do breeding schedules (**Em**) because they don't have a lot of space (**Inf**) and they can't always have as many animals as the animals want to (**Inf**).”

These examples illustrate how verbal protocol students thinking processes were interrelated, using several processes to make sense of what they were reading. Although verbal protocol students obviously engaged in processing the text for understanding and used a variety of processes to get there, the processes that they used were not the most effective for comprehending and analyzing persuasive text.

Verbal reports did not expose any differences in the way middle school students in grades six, seven, and eight thought about persuasive text because they rarely thought about the author's argument in the persuasive text as they read. Similarly, Kuhn (1992) found that the systematic differences in argumentative reasoning ability between grades six and nine did not exist. The verbal reports collected in the present study seemed to support Kuhn's findings.

Online Processing Relative to Text Sidedness and Content

Verbal protocol analyses revealed some differences between texts read in the online processes just illustrated. For instance, students reading the one-sided and two-sided refutation texts activated their prior knowledge more often than students who read the two-sided nonrefutation text. Protocol students who read one-sided text and two-sided refutation also made many more evaluations as they read than students who read the two-sided nonrefutation text. Verbal protocol students who read the nonrefutation text suggested a few alternatives, whereas students who read the one-sided text and the two-sided refutation text suggested many alternatives. It is possible that the content of the

one-sided and two-sided refutation texts prompted more evaluative processing in middle-school students. As we have seen in previous studies, persuasive content influenced adult readers (Alexander, et al., 2001; Murphy, 2001).

I reported in Chapter 4 that the one-sided text and the two-sided refutation text elaborated more on the emotional content presented in support of the author's claim and that the means for students' emotional-content ratings were significantly higher than the means for their factual-content ratings. In other words, middle school students in the large group appeared to change their beliefs considerably more after reading emotional content than after reading factual content. As students read emotional content, verbal protocol students used the evaluating processes previously illustrated more often than they used typical interpreting processes. Similarly, they evaluated the emotional content more often than they evaluated the factual content in the texts read. To be specific, verbal protocol students typically expressed approval or disapproval of the emotional content by agreeing or disagreeing with it or by expressing that it was wrong. The verbal protocol results for content type appear to be similar to the overall verbal protocol results for online reading. It may be that the emotional content in each text triggered more evaluative thinking during reading than interpreting.

Summary

Students reported engaging mostly in evaluative processes followed closely by interpretive processes, restating the text to explain, and making inferences. To evaluate as they read, students typically expressed approval or disapproval, suggested alternatives, and stated personal opinion. They did not, however, evaluate the author's argument. When interpreting the text, students typically paraphrased, empathized with the message,

or activated their prior knowledge of animals in zoos. Otherwise, students commonly restated text to explain and made inferences to process the text during reading. There was no indication that verbal protocol students were processing the author's argument or persuasive techniques presented in the texts read.

The most obvious difference in students' online processes between texts was that verbal protocol students who read the one-sided and two-sided refutation text evaluated the content more than students who read the two-sided nonrefutation text. Similarly, verbal protocol students evaluated the emotional content of the texts much more than the factual content presented by the author.

In the previous sections, I described and illustrated the processes verbal protocol students used to understand the text as they read, reporting differences relative to text sidedness and content type. I describe and illustrate in the next section the processes and strategies verbal protocol students used to analyze and comprehend the author's purpose and argument after reading persuasive text.

Postreading Processes: Identifying the Author's Purpose

The author's purpose identification measure assessed processes and strategies verbal protocol students used to identify the author's purpose for writing. Verbal protocol students reported on what they were thinking as they completed a comprehension question that asked them to identify the author's purpose for writing. I asked participants to indicate the author's purpose for writing at postreading in one multiple-choice question followed by four answer choices: (a) to persuade, (b) to inform, (c) to explain, and (d) to entertain. After transcribing the audio recordings, I analyzed verbal responses for patterns in reasoning by coding students' responses using Chambliss and Murphy's (2002)

strategies as a guide and adding strategies and processes as patterns occurred in the data. Table 3 in Chapter 3 shows the coding system I used to analyze Author's Purpose verbal responses.

As I reported in Chapter 4, the results of the large group Author's Purpose Identification measure revealed that most students did not recognize the argument patterns in the three persuasive texts, and therefore identified the author's purpose as to inform rather than to persuade. Verbal protocol students' thought processes and strategy-use for identifying the author's purpose provide some insight into why.

Students' verbal reports showed the most evidence of engaging in four main processes and strategies for identifying the author's purpose: (a) the structure strategy, (b) the topic strategy, (c) macroprocessing, and (d) importance of text content (Chambliss 1995). To reiterate, macroprocessing involves inducing the main idea of a text based on the details or patterns presented in the text. The structure strategy involves using knowledge of the argument structure to identify the main point and supporting evidence. Chambliss and Murphy (2002) found fourth and fifth graders to use versions of the same two processes, one of which was the topic strategy. The topic strategy involves inducing a general topic that subsumes the details in the text. Processing the importance of text content involved noting the presence of opinions, true facts, unknown information important for people to know, information remembered from the text, or content the reader agrees with. Although these are the four main processes and strategies students most commonly demonstrated, many verbal protocol students simultaneously engaged in the process of elimination to select the author's purpose.

Verbal protocol students employed the structure strategy often for finding the

author's purpose. Students using a structure strategy either identified the sides in the text or identified the author's claim to determine the author's purpose for writing. However, identifying the sides in the text was much more common than identifying the author's claim. Some verbal protocol students who recognized sidedness as a characteristic of persuasive writing accurately chose the author's purpose to persuade. Student 11 demonstrated using sidedness to identify the author's purpose to persuade.

S11: "I think it should be the first one [to persuade] because **it gives opinion between two different things, good or bad**, and it gives facts about each of the things."

Other students identified the sides presented and selected the author's purpose as to inform. These students recognized sides as a characteristic of informational text. They indicated that the text was written to inform because the author presented lots of facts on both sides. Student 4 demonstrated using sidedness to identify the author's purpose to inform.

S4: "I think that he informed the reader of something by presenting lots of facts because **he showed the good zoos and the bad**, so he wasn't trying to persuade us, or entertain us, or provide an explanation about it."

Only two verbal protocol students identified the author's claim to determine the author's purpose after reading, but only Student 20 used it to successfully identify the author's purpose for writing.

S20: "**It's arguing that zoos are harmful to animals**, so that's why I picked that one [to persuade]."

Verbal protocol students employed the topic strategy to find the author's purpose after reading almost as often as the structure strategy. These students based their answer selection on the details in the text that were subsumed by the topic statement they selected. Student 10 demonstrated using the topic strategy by relying on the facts in the text that were subsumed by the topic of zoos.

S10: "I think the author's purpose was to inform the reader of something by presenting a lot of facts. They did try and persuade you but not as much as trying **to inform you about zoos and how they are getting old and outdated** if we have to keep the animals in there and **they're not happy. And they're presenting a lot of facts by telling us how we do have TV and Internet and we can just switch those on instead of running to zoos** and looking at animals that are sad and depressed and lazy."

Verbal protocol students who relied on the topic strategy identified the author's purpose to inform rather than to persuade.

Verbal protocol students used macroprocessing and the importance of text content more often than they used the topic strategy for finding the author's purpose. Students who engaged in macroprocessing to determine the author's purpose induced the claim from the evidence presented in the text to identify the author's purpose to persuade. Student 15 demonstrated macroprocessing by using the details presented to induce the author's purpose.

S15: "Basically the author was **trying to persuade you into not liking zoos like he did because he kept on presenting the same facts over and over on how they're abusive to animals, and how they're not feeding**

correctly and they don't get enough exercise with lots of backup support to that."

Verbal protocol students typically used the importance of text content to determine the author's purpose for writing as much as they used macroprocessing. When they used the content of the text, students pointed out the presence or absence of opinion, or they indicated that the information presented was true or important facts. Student 19 relied solely on the importance of the content.

S19: "... I think the author's main purpose for writing this article was to inform us about the facts **because a lot of people don't know what happens behind the scenes at zoos.** They think it's just animals that get fed every day and not hurt. But **they don't know that the animals are really getting hurt.**"

Other students did not rely on the content of the text exclusively. They considered the content in conjunction with the strategies and processes I previously described.

Author's Purpose Processing Relative to Text Sidedness

I reported in Chapter 4 that large group results did not vary by text sidedness for author's purpose identification. Middle-school students seemed to be no more familiar with the argument pattern in the one-sided text than they were with the argument patterns the author used to persuade the reader in the two-sided texts. Verbal protocol analyses revealed the processes and strategies that students typically engaged in depending upon which text they had read. For example, verbal protocol students who identified a one-sided text as having the purpose to persuade typically engaged in macroprocessing. Student 7 gave a typical response using macroprocessing in the one-sided text.

S7: “1 [to persuade] because **he was giving all these examples and telling about animals that were getting hurt in these zoos. That’s why I think he’s against something and he’s arguing that there shouldn’t be zoos.**”

Verbal protocol students who read the two-sided refutation text typically engaged in the topic strategy and identified the author’s purpose as to inform. Student 17 surmises the author’s purpose for writing the two-sided refutation text based on the details presented by the author.

S17: “2 [to inform] to inform us and to tell us like facts **about zoos** so we have a better picture of zoos and **that they’re not just a wonderful place where animals live but almost like a jail.**”

Those students who read the two-sided nonrefutation text typically identified sides in the text to determine the author’s purpose as to inform and to persuade. Student 11 demonstrated using sidedness in the two-sided nonrefutation text to identify the author’s purpose to persuade.

S11: “I think it should be the first one [to persuade] because **it gives opinion between two different things, good or bad**, and it gives facts about each of the things.”

Student 4 demonstrated using sidedness in the two-sided nonrefutation text to identify the author’s purpose to inform.

S4: “I think that he informed the reader of something by presenting lots of facts because **he showed the good zoos and the bad so he wasn’t trying to persuade us**, or entertain us, or provide an explanation about it.”

Summary

Verbal protocol students employed several different strategies and processes to determine the author's purpose for writing: identifying sides, the topic strategy, macroprocessing, and using text content. Verbal protocol students reading the one-sided text typically employed macroprocessing to induce the author's claim, which led them to identify the author's purpose as to persuade. Verbal protocol students who read the two-sided refutation text typically employed the topic strategy and identified the author's purpose as to inform. Those students who read the two-sided nonrefutation text typically recognized the sides in the text and identified the author's purpose as to inform or to persuade. Only two students identified the author's claim as a means to determining the author's purpose, but only one student connected the claim with the author's purpose to persuade.

Postreading Processes: Identifying the Author's Argument

The Main Point Identification measure assessed processes and strategies verbal protocol participants used to figure out the author's main claim, and the Supporting Detail Identification measure assessed processes and strategies that verbal protocol students used to figure out the detail that supported the author's main point. After reading, verbal protocol students reported on what they were thinking as they identified the author's claim and a supporting detail from a choice of five answers: (a) a topic statement, (b) the argument claim (i.e., the author's main claim for the one-sided and two-sided refutational text), (c) an instance of evidence presented in all three texts, (d) the nonrefutation claim (i.e., "experts disagree on keeping animals in zoos"), and (e) a counterclaim presented in the two-sided refutation text. After transcribing the audio

recordings and crosschecking with my notes, I analyzed verbal responses for patterns in processes by coding students' responses using Chambliss and Murphy's (2002) patterns for comprehending argument as a guide and adding processes and strategies as patterns occurred. Table 4 in Chapter 3 displays the codes, descriptions, and qualifiers I used to analyze Main Point and Supporting Detail Identification verbal protocols.

Main Point Processing

The large group data revealed in Chapter 4 that middle-school students had difficulty identifying the author's main point in the persuasive texts they had read. Some students were able to identify the author's main point; however, a majority of students could not. Instead of selecting the author's claim for the main point, most students selected the topic statement. Students' verbal reports illustrated how they attempted to identify the author's main point and why they may have had a difficult time.

Students' verbal reports showed that they typically used the same four processes and strategies for identifying the author's main point as they did to determine the author's purpose for writing: (a) the topic strategy, (b) macroprocessing, (c) the structure strategy, identifying sidedness, and (d) using the importance of text content. Students who typically chose the topic statement as the author's main point used either the topic strategy or the structure strategy. The topic strategy was most commonly used by verbal protocol students to find the author's main point. These students based their answer selection on details (information, facts, or examples) in the text subsumed by the topic statement. Student 7 demonstrated the use of the topic strategy based on text details that could be subsumed by the topic statement, "zoos and their treatment of animals."

S7: **“He gave a lot of points about ‘zoos and their treatment of animals’ like different zoos and what they did to their animals. The elephant gets hurt at one zoo, the other one was at another, a monkey at another zoo, how and what zoos do what to their animals and how bad it is.”**

Verbal protocol students who used the structure strategy typically identified the topic statement as the author’s main point. Students’ responses referred to the author giving both sides, “good” treatment and “bad” treatment, and the author not showing bias or “picking a side.”

S4: **“I believe that the main point was ‘zoos and their treatment of animals’ because he said that he was showing the good side of zoos and the bad. So he wasn’t really picking a side.”**

These students seemed to identify the balanced argument in the two-sided nonrefutation text as a characteristic of informational text. As a result, verbal protocol students selected the topic statement to represent the author’s main point.

Verbal protocol students who used macroprocessing and the text content to determine the author’s main point typically identified the argument claim as the author’s main point. All verbal protocol students who used macroprocessing induced the author’s claim that “zoos do not treat animals fairly,” from the evidence presented in the text to identify the author’s main point. Student 9 demonstrated macroprocessing using the text details to induce the author’s main point.

S9: **“I think the author’s main point in this article is that ‘zoos do not treat animals fairly’ because he was giving many, many information about**

what they did wrong and what they could have done better and how they harm the animals in zoos.”

Verbal protocol students using the content of the text to determine the author’s main point either selected the statement that they agreed with or remembered as stated in the text. Student 3 demonstrated selecting the nonrefutation claim, “experts disagree on keeping animals in zoos,” for the author’s main point that he agreed with.

S3: “...**because animals really don’t need to be in zoos because you can go out and see them like Jeff the Crocodile Hunter.** He used to go out and find the crocodiles, or the snakes or iguanas. He used to go out and find them all the time.”

Student 21 demonstrated selecting the argument claim, “zoos do not treat animals fairly,” for the author’s main point that she remembered as stated in the text she read.

S21: “**In the last paragraph it does say how the animals are abused and neglected.**”

Recognizing the importance of text content typically did not help verbal protocol students to accurately identify the author’s main point for the text they had read.

Main-Point Processing Relative to Text Sidedness

Although the large group results revealed that students had difficulty identifying the author’s main point, results varied depending on the text read. According to the large group data, only those students who read the two-sided refutation text accurately identified the argument claim for the author’s main point more often than selecting any of the other choices. I have described the strategies verbal protocol students used to determine the author’s main point, but exploring strategies relative to text sidedness

provides insight into how text sidedness influenced students' main point thought processes and strategy use and possibly student outcomes.

For example, verbal protocol students reading the one-sided text typically used the topic strategy to determine the author's main point. Student 1 demonstrated use of the topic strategy to determine the author's main point of the one-sided text.

S1 “1 [topic statement] I put ‘zoos and their treatment of animals’ because it **talks a lot about their treatment and how they were abused and neglected.**”

If students in the large group relied on this strategy to determine the author's main point in the one-sided text, they would have had difficulty identifying the main point as the author's claim.

Verbal protocol students reading the two-sided refutation text typically used the topic strategy or macroprocessing to determine the author's main point. Student 10 demonstrated using the topic strategy to determine the author's main point in the two-sided refutation text.

S10: “1 [topic statement] because **the author's main point was saying how zoos treat their animals and if it's good treatment, bad treatment, otherwise treatment, and what's happening from the treatment of their animals, how they get depressed and how they can actually get health problems from that.**”

Student 26 demonstrated using macroprocessing to determine the author's main point in the two-sided refutation text.

S26: “2 [argument claim] because **in mostly every paragraph they gave a reason like they don’t have enough space**, and any other reason why the animals aren’t being treated fairly. **Some of the paragraphs did have some of the good facts that a zoo had but most of them were against the zoos.**”

As I wrote earlier, all verbal protocol students who used macroprocessing accurately identified the author’s main point. If students who read the two-sided refutation text in the large group were using macroprocessing, large group results would have shown that students were more successful at selecting the argument claim statement for the author’s main point.

Verbal protocol students reading the two-sided nonrefutation text typically identified sides (a structure strategy) to determine the author’s main point, which seemed to lead them to select the topic statement for the author’s main point. Student 11 demonstrated using the structure strategy to determine the author’s main point in the two-sided nonrefutation text.

S4: “I believe that the main point was ‘zoos and their treatment of animals’ [topic statement] because he said that he was showing **the good side of zoos and the bad side**, so he **wasn’t really picking a side.**”

If students in the large group recognized the sides in this text as indicative of informational text, it makes sense that they selected the topic statement more often to represent the author’s main point.

Identifying the Supporting Detail

The large group data revealed in Chapter 4 that middle-school students had difficulty identifying the supporting detail statement in the persuasive texts they had read. Some students were able to identify the supporting detail statement; however, a majority of students could not. Instead of selecting the evidence statement for the supporting detail, most students selected the argument claim statement. Students' verbal reports illustrated how they attempted to identify the supporting detail statement and why the task may have been challenging.

An analysis of students' verbal reports while attempting to identify the supporting detail statement showed that most students engaged in three main processes and strategies: (a) macroprocessing, (b) using the topic strategy, and (c) referring to the importance of text content. Using these processes and strategies, verbal protocol students typically selected the argument claim as the supporting detail.

To identify the supporting detail, verbal protocol students used macroprocessing to induce the author's claim from the evidence presented in the text they had read. For instance, Student 16 selected the argument claim statement, "zoos do not treat animals fairly," for the supporting detail by inducing the author's claim after reading.

S16: I think it was clear that the author doesn't approve of the way the animals are treated, frankly **because she puts different times that they're beaten with different things and the author expresses feelings of why it's wrong that they get beaten and sold sometimes just to be killed.**"

Macroprocessing to induce the gist of the author's claim did not help students to accurately identify the supporting detail regardless of the text they read. It did, however,

help students to identify the author's claim. All students using macroprocessing selected a claim statement, either the argument claim or the nonrefutation claim, for the supporting detail statement.

Verbal protocol students also employed the topic strategy to identify the author's supporting detail after reading. These students based their answer selection on the gist of the text they had read. Student 6 demonstrated the use of the topic strategy to determine the supporting detail statement. He selected the nonrefutation claim, "experts disagree on keeping animals in zoos," based on what the author talked mostly about.

S6: **"In the whole article they talked about the experts and how they didn't like the animals in there because they needed bigger space or they needed to be in their habitat."**

Students who relied on the topic strategy identified the author's supporting detail as any of the five answer choices given (e.g., topic statement, argument claim, evidence statement, counterclaim, or nonrefutation claim).

Verbal protocol students typically referred to the importance of the content of the text to identify the supporting detail statement, choosing the statement with which they agreed or remembered was stated in the text. After reading, Student 3 agreed with the argument claim statement, "zoos do not treat animals fairly," and selected it as the supporting detail statement.

S3: **"... because zoos don't treat the animals fairly because all they do is hurt them and they just let them die."**

Verbal protocol students generally searched for the main idea using macroprocessing, the topic strategy, or used the importance of the content to find the supporting detail

statement among the answer choices. As a result, they typically selected a claim statement as the supporting detail.

Supporting-Detail Processes Relative to Text Sidedness

The large group results for the Supporting Detail by Text Sidedness investigation revealed that a statistically significant relationship existed. Students who read the one-sided text and the two-sided refutation text were more likely to accurately select the evidence statement for the supporting detail than those students who read the two-sided nonrefutation text, but only students who read the two-sided refutation text accurately identified the supporting detail statement more frequently than any of the other choices. Although none of the processes and strategies that verbal protocol students used to determine the supporting detail statement were effective, analyzing them relative to text sidedness may help to explain the large group data.

Verbal protocol students who read the one-sided and two-sided refutation texts typically relied on the importance of the content of the text to identify the author's supporting detail. Typically, if they agreed with the statement, found it stated in the text, or believed it to be true, they selected it as the supporting detail statement. After reading the one-sided text, Student 19 gave a typical response agreeing with the nonrefutation claim she selected, "experts disagree on keeping animals in zoos."

S19: "...**because experts disagree on keeping animals in zoos. I think that they do disagree because animals in zoos isn't right.** They can get hurt and killed. There are other animals like mice that are fed to them that are getting killed and I don't think that it's right either."

After reading the two-sided refutation text, Student 24 selected the evidence statement as the supporting detail that she remembered reading in the passage.

S24: **“Because it stated in page 7 the paragraph that reads... “An Oxford University research team...”** and also the one above it too states that animals cannot exercise.”

There was no indication in verbal reports that students used a more successful strategy or process in the two-sided refutation text to determine the supporting detail as the large group data suggested.

Verbal protocol students reading the two-sided nonrefutation text used the topic strategy and macroprocessing to determine the supporting detail. Student 6 demonstrated using the topic strategy to select the nonrefutation claim, “experts disagree on keeping animals in zoos,” for the supporting detail in the nonrefutation text.

S6: **“In the whole article they talked about the experts and how they didn’t like the animals in there** because they needed bigger space or they needed to be in their habitat.”

Student 12 demonstrated using macroprocessing to select the argument claim as the supporting detail after reading the two-sided nonrefutation text.

S12: **“...because they gave me more reasons of them treating the animals unfairly than fairly.”**

The topic strategy and macroprocessing were the least effective processes and strategies used with zero accuracy for identifying the supporting detail statement. If students in the large group who read the two-sided nonrefutation text used the topic strategy or

macroprocessing to determine the supporting detail, they would be the least successful at identifying the supporting detail in this text structure.

Summary

Verbal protocol students employed several different strategies and processes to determine the author's argument: identifying sides, the topic strategy, macroprocessing, and using the importance of text content. When selecting the author's main point, verbal protocol students typically employed the topic strategy and selected the topic statement as the main point. However, when students used macroprocessing, all students were able to induce the author's main point based on the details presented, particularly in the one-sided and two-sided refutation texts. Verbal protocol students appeared to be less familiar with the two-sided nonrefutation text. Although students recognized the sides in this text, they seemed to recognize the structure as a balanced presentation of information and, therefore, written to inform the reader.

When identifying the supporting detail statement, protocol students were most comfortable relying on the importance of text content (e.g., what they agreed with, believed to be true, or was stated in the text), but they had limited success. Students attempted to use the topic strategy and macroprocessing to determine the supporting detail statement as well, but neither of these strategies helped them to determine the supporting detail statement.

In the last two sections, I described and illustrated verbal protocol students' postreading strategy use for identifying the author's purpose and argument. In the next section, I explore verbal protocol students' evaluative reasoning in persuasive text.

Postreading Processes: Evaluating Argument

The Evaluative Reasoning measure assessed verbal protocol students' basis for ratings of premise statements after reading persuasive text. I asked verbal protocol students to report on what they were thinking as they rated four premise statements on keeping animals in zoos and as they selected a basis for each rating. Verbal protocol students chose from three sources for rating each premise statement, one text-based source and two nontext-based sources: (a) I rated the statement based mostly on the evidence presented in the text, (b) I rated the statement based mostly on what I already know about zoos, or (c) I rated the statement based mostly on what I believe or feel is true about zoos. After transcribing the audio recordings and cross-checking with my notes, I analyzed verbal responses for patterns in reasoning by coding students' verbal responses as evidence-based, prior-knowledge-based, or belief-based. Evidence-based reasoning means students used text-based information to evaluate the premise statements. Knowledge- or belief-based reasoning means students used information from other than the text to evaluate the premise statements, namely from either their prior knowledge or their beliefs about zoos. I refer to these coding categories as Evaluative Reasoning codes. Table 5 in Chapter 3 shows the coding system I used to analyze Evaluative Reasoning verbal reports.

As reported in Chapter 4, students in the large group rated the four premise statements mostly on the evidence presented in the text rather than on their prior knowledge or their beliefs or feelings. This held true even when prior knowledge- and belief-based selections were combined into one nontext evaluative reasoning category.

The middle school students in the present study indicated that they used the evidence to evaluate the premise statements considerably more than they used nontext sources, such as their prior knowledge and beliefs, which suggests that they thought about the evidence presented in the text when rating premises on zoos. Contrary to these findings, Kuhn et al. (1988) found that students in grade six did not make good use of the evidence as a basis, relying more on their beliefs and prior knowledge when asked to consider evidence in light of a scientific theory, often vacillating between their beliefs or prior knowledge and evidence-based evaluating. Middle-school students' verbal responses revealed patterns which were not entirely consistent with either large group data or with Kuhn et al.'s (1988) findings.

Analyses of students' verbal rationales revealed a more balanced use of evidence, prior knowledge, and beliefs as a basis for rating the premise statements than the large group outcomes indicated. Typically, verbal protocol students' responses indicated that they reasoned from both text-based and nontext-based sources. This phenomenon can be illustrated by describing students' rationales for rating the premise statements.

Although verbal protocol students indicated in their task booklet that they used either the evidence presented, their prior knowledge of zoos, or their beliefs concerning zoos to rate the premise statements, their verbal rationales frequently indicated that they reasoned from both text-based and nontext-based sources. For example, if verbal protocol students indicated that their evaluative reasoning selection was 1, "I rated the above statement based mostly on the evidence presented in this article," they typically reported on what they already knew or on what they believed about zoos. Student 23 demonstrated the type of rationale that verbal protocol students typically gave. Although he indicated in

his task booklet that he used mostly the evidence presented in the text to rate premise statement 2, Student 23 verbally reported using his prior knowledge in addition to his beliefs to rate the premise, “Animals have a better life in zoos than in their natural environments.”

S23: “Rating 3 [disagree] because like I said in the last one, they might be abused, neglected, or depressed [**evidence-basis**], like if a wolf is left alone without any other wolves who travel in packs, it would be lonely and depressed [**knowledge-basis**]. It could be abused [**evidence-basis**] and it could die from starvation [**knowledge-basis**] because zoos put visitors first [**evidence-basis**]. So I think that they have better lives in the wild with their own kind, and they don’t have to worry at all about starving to death or anything [**belief-basis**].”

The reverse was also evident. When verbal protocol students selected evaluative reasoning basis 3, “I rated the above statement based mostly on what I believe or feel is true about zoos,” they often reported on using the evidence presented or their prior knowledge of zoos, the Internet, TV and so on. For example, Student 3 indicated in his task booklet that he used mostly his beliefs or feelings to rate the premise, “Animals shouldn’t be kept in zoos because zoos are harmful to animals.” However, he reported that his beliefs were based on the evidence presented in the text.

S3: I put a 10 [strongly agree] and a 3 [**belief-basis**]. Animals should not be kept in zoos because they’re harmful [**belief-basis**]. All they do is beat the animals [**evidence-basis**], they don’t feed them right [**evidence-basis**], they feed them from animals that they don’t really hunt [**evidence-basis**].”

Verbal reports reveal that students did not differentiate well between reasoning based on evidence, prior knowledge, and their beliefs. As these responses illustrate, verbal protocol students used a combination of the evidence, their beliefs and/or their prior knowledge to rate the premise statements even though they indicated that they used one or the other.

Verbal reports also revealed that evaluative reasoning selections were impacted by the premise statements themselves. Many verbal protocol students evaluated premise statement 1, “Animals should be kept in zoos to entertain and educate people,” and premise statement 4, “We don’t need zoos to learn about wild animals when we have TV and the Internet,” mostly using their prior knowledge and beliefs regarding zoos. For these two premise statements, verbal protocol students brought up issues not mentioned in the text, such as the need for zoos to help endangered species, Internet access and Internet site trust issues, and a personal preference to seeing live animals at zoos. Student 6 reported using prior knowledge of zoos to disagree with premise statement 1, “Animals should be kept in zoos to entertain and educate people,” but selected answer choice 2 indicating that he used mostly his prior knowledge of zoos.

S6: “[Rating 3 – disagree] No, because **sometimes they go into zoos because they’re endangered species.** [Answer choice 2 - knowledge basis]

Because it didn’t tell me in the article.”

Student 20 reported using prior knowledge of zoos to disagree with premise 4, “We don’t need zoos to learn about wild animals when we have TV and the Internet,” although she selected answer choice 3 indicating that she used mostly her beliefs.

S20: “[Rating 2 – disagree] ...**on the Internet they could put any picture and then put a caption for the wrong reason. But in a zoo you could**

actually see the animals and it's real. So I'd have to say that it's really close to almost completely wrong for me but not all the way.

Student 24 reported using her beliefs about zoos to rate premise statement 4.

S24: “[Rating 5 – neutral] **I believe the real thing would be much better than TV and the Internet because if you actually experience it I think you'd learn more.** [Answer choice 3 - belief basis].

These responses may indicate that middle-school students know when to use the evidence presented and when to use their prior knowledge and beliefs to evaluate an argument although at times in biased ways, such as when the premise statement conflicted with their beliefs. Verbal protocol results seem to support Kuhn et al.'s (1988) idea that students have the ability to evaluate evidence but lack the skill. Thus, there is a gap between performance and competence.

Summary

Verbal protocol results revealed that middle-school students reason from both text-based and nontext-based source and that they do not always clearly differentiate between sources. Verbal protocol analyses also revealed that middle-school students' use of sources depended on the premise they were evaluating and whether or not they agreed or disagreed with it. Results support Kuhn et al.'s (1988) idea that students have the ability to evaluate evidence but lack the skill.

Chapter 6: Conclusion and Implications for Research and Instruction

This study investigated sixth-, seventh-, and eighth-graders' comprehension, analysis, and evaluation of lengthy written persuasive text. First, this research specifically investigated what middle-school readers identify as the author's purpose and argument. Second, this study examined the influence of text sidedness and persuasive content on middle-school readers' beliefs and perceived knowledge. Third, this work explored how middle-school students evaluate argument. Finally, this research described how middle-school readers process persuasive text relative to text sidedness and content.

Previous research in comprehension, evaluation, and persuasion supports several hypotheses. First, research supports the hypothesis that one-sided text would be most comprehensible, with middle-school students more likely to accurately recognize and identify the simple argument structure than the complex argument structure in two-sided refutation (Chambliss, 1995; Chambliss & Murphy, 2002; Golder & Coirier, 1994; Kuhn, 1992; Kuhn et al., 1988, Larson, et al., 2004; Murphy, 2001). Second, research in evaluating argument suggests a number of hypotheses. Research indicates that a number of reader variables impact evidence weighing: background knowledge and beliefs (Buehl et al., 2001; Kuhn et al., 1988; Lord et al., 1979; Stein & Miller, 1991, 1993), evaluative mindset (Stanovich & West, 1997) and metacognitive development in evidence weighing (Kuhn et al., 1988; Kuhn, 1989, 1991, 1992). With regard to evaluating evidence, I anticipated that middle-school students would respond in a number of ways, depending on these reader variables. I expected verbal protocol analyses to illustrate patterns in middle-school students' evaluating processes.

Third, research in persuasion suggests that the one-sided text structure would be most successful at changing middle-school students' initial beliefs (Buehl et al., 2001; Golder & Coirier, 1994; Lord et al., 1979; Murphy, 2001), and that emotional appeals would be highly convincing, especially in conjunction with multiple forms of evidence (Alexander et al., 2001; Murphy, 2001). Regarding perceived knowledge change, I hypothesized that the two-sided nonrefutation text structure would be most facilitative at changing middle-school students' perceived knowledge about zoos (Buehl et al., 2001) and that perceived knowledge levels would be associated with belief change in persuasive text (Alexander et al., 2001; Buehl et al., 2001). This chapter summarizes the findings according to these hypotheses and compares the outcomes for middle-school students with findings from other research. The chapter concludes with implications for research and instructional practice.

Summary of Major Findings

Research supports the hypothesis that one-sided text would be most comprehensible to middle-school students, but most students in the present study did not recognize the text they had read as text written to persuade regardless of text sidedness. Although there was no significant difference in author's purpose selections between texts, verbal reports revealed that students typically engaged in either a structure strategy, macroprocessing, or the topic strategy depending upon text sidedness. Likewise, most middle-school students could not accurately identify the basic parts of the author's argument in the text they had read, although there were differences among texts. Those students who read the two-sided refutation text identified the claim and evidence statements more often than students who read the one-sided and two-sided nonrefutation

texts, who were more likely to select the topic statement for the main point and the claim statement as a supporting detail. Verbal reports revealed differences in thought processes and strategy use between texts read.

Although most students could not identify the author's argument, most students indicated that they used the evidence presented when evaluating premises on zoos. Evaluative reasoning selections were significantly impacted by the premise statements, text sidedness, and the amount of emotional content in the text read. Verbal protocol analyses revealed that students used both text-based and nontext-based sources to evaluate the premise statements depending upon the premise statement being evaluated.

Students' beliefs regarding zoos were also impacted by sidedness and the emotional content in the text read. Their mean belief ratings suggested that changes in their beliefs after reading varied by the amount of emotional content presented and by text sidedness. Postreading beliefs increased toward the argument claim more dramatically after reading the one-sided text, followed by the two-sided refutation text, and rose less dramatically after reading the two-sided nonrefutation text. Students were also highly persuaded by the emotionally appealing support presented by the author, more so than by the factual content, particularly in the one-sided text which elaborated more on instances of animal abuse. However, differences between texts were small.

Likewise, middle-school students' perceived that their knowledge regarding zoos increased significantly after reading, particularly after reading the one-sided text. All students rated their perceived knowledge similarly before reading, but postreading perceived knowledge ratings rose to the highest level after reading the one-sided text, then the two-sided refutation text, and finally the two-sided nonrefutation text. There was

a small, positive relationship between middle-school students' postreading perceived knowledge about zoos and their postreading beliefs on the issue. However, prereading perceived knowledge among middle-school students was not significantly related to prereading beliefs, content-specific beliefs, or postreading beliefs about zoos.

These findings either support or extend the existing literature in comprehending argument, argumentative reasoning, and persuasion. In the following sections, I discuss the present findings in light of past research. I end the discussion with implications for research and instruction

Comprehending Argument in Persuasive Text

In Chapter 2, I described a model of argument comprehension that Chambliss (1995) devised from her work with high school seniors who were good readers. The model was comprised of three stages. In stage one of comprehending an argument, good readers recognize the claim-evidence structure in the text and identify the text as argument. In stage two, good readers go on to identify the argument's claim and evidence in the text. If the claim is not explicitly stated in the text, they induce the claim from the introduction and evidence presented in the passage. In stage three, good readers mentally construct an argument representation of the author's message.

By interpreting the present findings in light of Chambliss' (1995) model, it becomes apparent that a majority of middle-school students did not fully comprehend the persuasive text they had read. First, most middle-school students did not recognize patterns in the texts as argument written to persuade regardless of the text read. Students were as likely to identify the author's purpose as to inform after reading the one-sided text containing a simple argument structure as they were after reading two-sided

refutation containing a complex argument structure and two-sided nonrefutation containing a balanced argument structure. Because they similarly identified simple argument, complex argument, and unbiased argument as text written to inform, most middle-school students seemed to have no argument schema to which argument structures could be matched.

Because students were for the most part unaware of the author's purpose to persuade, they did not proceed to step two to identify the author's claim and evidence. The findings from the present study support this likelihood. In the present study, a majority of middle-school students could not accurately identify the author's main point as the author's claim in the persuasive text they had read. For the most part, students confused a topic statement and counterclaim for the author's main point. This finding is consistent with past research where children through adults confused evidence, counterclaims, and general topic statements with the author's main claim (Chambliss & Murphy, 2002; Kuhn, 1992; Kuhn et al., 1988, Larson, et al., 2004).

Middle-school students did not do any better at identifying the supporting detail statement. Overall, middle-school students selected a claim statement for the supporting detail. They most often confused the argument claim statement for the supporting detail, followed by the nonrefutation claim, the topic statement, and the counterclaim. Just as with the main point results, this finding is consistent with past research where readers confused evidence, counterclaims, and general topic statements with an argument's claim (Chambliss & Murphy, 2002; Kuhn, 1992; Kuhn et al., 1988, Larson, et al., 2004).

As Chambliss' (1995) work showed, good readers comprehend argument by first recognizing patterns in the text as argument, and then by identifying the author's

argument so that they may mentally represent the author's message. Although some students in the present study did recognize the author's purpose to persuade and could identify the author's argument in the text they had read, verbal protocols revealed that they did not use knowledge of persuasion, argument structure or the claim-evidence relationship to identify the parts of the argument. For instance, although the author's claim was explicitly stated in the introductory and concluding paragraphs of each text, a majority of verbal protocol students who selected the correct claim statement for the text they had read induced the claim from the details presented rather than identifying the exact claim presented in the text. This finding is consistent with what Chambliss and Murphy (2002) found among fourth- and fifth-grade students who read and recalled argument. Students' identification of argument structures was very limited, whereas inferred arguments, or claims that were not exact statements or close paraphrases of the claim in the text, were much more likely (Chambliss & Murphy, 2002). Furthermore, most verbal protocol students in the present study, who accurately induced the claim, previously identified the author's purpose as to inform. These findings seem to indicate that most middle-school students do not have knowledge of argument structure or its purpose to persuade even though they have been instructed in how to compose persuasive essays in their writing classes.

Chambliss and Murphy (2002) suggested a possible developmental sequence among fourth- and fifth-grade students reading argument where children represent argument as a list of details at one end of a continuum and represent the accurate argument structure at the other end of a continuum with different levels of partial representations in between. Findings from the present study indicate that middle-school

readers fall somewhere in between the extremes. First, a majority of middle-school students identified the author's purpose as to inform and identified the argument as a topic-detail structure rather than a claim-evidence structure. Second, verbal protocols revealed that students who could identify the author's main point and a supporting detail commonly used macroprocessing (Kintsch & van Dijk, 1978) rather than argument structure (Meyer, 1985; Meyer, Brandt, & Bluth, 1980; Meyer & Freedle, 1984) to identify the author's argument. Evidently, middle-school students do not have a well developed schema for argument or persuasive text. According to past research, an undeveloped schema for argument and persuasive text will impact how students evaluate the evidence presented (Kuhn, 1989, 1991, 1992; Kuhn et al., 1988; Stein & Miller 1991, 1993).

Evaluating Argument in Persuasive Texts

The work of Kuhn and colleagues (Kuhn, Amsel, & O'Loughlin, 1988) revealed that students in grades three through adults have limited ability in weighing evidence against a scientific theory or problem. Kuhn found that younger children in particular do not weigh evidence spontaneously but reason with their own beliefs and prior knowledge suggesting that they do not differentiate between evidence and their own theories. By contrast, a majority of students in the present study indicated that they relied mostly on the evidence presented in the text they had read to rate premise statements on zoos. However, verbal protocol analyses revealed discrepancies between the sources students selected in their booklets and the sources their verbal responses were indicative of to rate the premises on zoos.

Verbal protocol students who indicated in their task booklet that they used mostly the evidence presented in the text, simultaneously reported using their prior knowledge and/or their beliefs to rate the premise statements. The reverse was also true. It seemed clear that students in the present study did not differentiate between reasoning based on evidence in the text and reasoning based on their prior knowledge and beliefs, sources outside the text read.

Furthermore, findings from the supporting detail investigation indicated that most students could not distinguish the author's claim from supporting evidence when asked to identify the supporting detail. This finding suggests that middle-school students did not clearly differentiate between what is a claim and what is evidence. Yet, they indicated in their task booklets for the evaluative reasoning measure that they used mostly the evidence presented. Students may have selected "evidence" as the basis for their ratings because they have learned in school that evidence should be used to support their answers, and when supporting an answer, anything in the text counts as supporting evidence.

If students lacked the ability to differentiate between claims and evidence, then their ability to evaluate the premise statements may have been hindered. The results of the comprehension investigation indicated that middle-school students did not fully understand what evidence is and how it is used to support a claim in persuasive text. According to Kuhn (1989), this lack of differentiation hinders the ability to weigh evidence and control belief bias (Kuhn, 1989). Results indicated that students evaluated the premise statements in biased ways. Verbal reports revealed that when students were in disagreement with the premise statement they were rating, they used their beliefs or

and/or their prior knowledge to evaluate it. Further verbal protocol analyses of students' evaluative reasoning could investigate occurrences of biased reasoning among middle school students.

Moreover, recall that verbal protocol students' thought processes during reading largely consisted of evaluating processes, such as agreeing or disagreeing with the author and the circumstances in the text, suggesting alternatives to the situations encountered, or stating their opinion of circumstances in the text. Verbal protocol students did not evaluate the argument in the text they had read, weighing the evidence presented against the author's claim. Rather, verbal protocol students appeared to take an anticipatory stance toward the content in the texts, where they expressed their thoughts about the circumstances in the text based on their beliefs, feelings or prior knowledge (Pressley & Afflerbach, 1995).

Nevertheless, Kuhn (1989; 1991; 1992; Kuhn et al., 1988) argued that evaluating evidence is a matter of skill, not competence. Kuhn et al. (1988) found that sixth-graders made very little use of the evidence in justifying their opinions, with many students weighing the evidence selectively, suggesting that they had the competence to explicitly evaluate evidence. Thus, Kuhn et al. suggested a gap between performance and competence and concluded that students lacked evidence evaluation skills. First, they lacked the ability to encode and represent evidence and theory as separate entities. Second, they lacked the ability to think about a theory rather than with a theory and thus lacked the ability to evaluate the bearing of evidence upon theory. Third, they lacked the ability to temporarily set aside their own views in order to evaluate how the evidence relates to the presented view. A majority of middle-school students in the present study

seemed to mirror the lack of argumentative thinking skills Kuhn et al. observed among children and adult participants. ANOVA results and verbal protocol analyses revealed that students considered the evidence when evaluating certain premise statements and relied more on their beliefs when evaluating others, indicating that they have the competence to reason but probably lack the skill with written persuasion.

In Chapter 2, I described and illustrated Kuhn's (1989, 1991, 1992) developmental framework of argumentative skill. At the lower end of the developmental continuum, mental representations of evidence are not differentiated from theory, and evidence weighing does not exist. At the other end of the continuum, mental representations of evidence are differentiated from theory and can therefore be acted on and evaluated relative to mental representations of alternative theories. Kuhn's work revealed that young children and many adolescents and adults exhibited characteristics from the lower end of the developmental continuum. They did not sufficiently differentiate the evidence from theory, and therefore they were unable to weigh evidence (Kuhn, 1989, 1991, 1992; Kuhn et al., 1988). Aside from the finding that a majority of middle-school students in the present study identified the text read as written to inform, a majority of students could not clearly discriminate between the claim and evidence. According to Kuhn's model, most middle-school students in the present study exhibited characteristics from the lower end of the developmental continuum.

Kuhn (1989, 1991, 1992; Kuhn et al., 1988) argued that evaluating argument requires thinking about the evidence rather than simply being influenced by it. Students in the present study not only exhibited characteristics from the lower end of Kuhn's developmental continuum, they were, for the most part, not aware of the author's purpose

to persuade the reader, nor were they aware of the author's use of emotional appeals. It was not surprising that their initial beliefs were highly influenced by the evidence presented in the persuasive texts they had read under these circumstances.

Changing Beliefs and Knowledge in Persuasive Text

As I explained in Chapter 2, Stein and Miller (1991, 1993) argued that background knowledge about the content, structure, and functions of argument, domain knowledge, and prior held beliefs regulate support for a particular position. They suggested that if differences in background knowledge and beliefs regulate support for a particular position, then taking a position in an argument and presenting supporting evidence is a function of knowledge and beliefs, rather than a matter of development in argumentative skill. Thus, Stein and Miller hypothesized that background knowledge and beliefs control how people mentally represent argument and how they will be persuaded. In the next section, I discuss belief change relative to prior held beliefs, prereading perceived topic knowledge, and persuasive content and how the findings confirm or extend the existing literature.

According to Stein and Miller's (1993) theory, if students' prereading beliefs held that zoos were educational and that they did more good than harm, then any argument to the contrary may be seen as irrelevant when choosing their position and selecting evidence to support it. Moreover, sixth and ninth-graders in Kuhn's (1988) study appeared to be less able to weigh evidence when the evidence conflicted with their own theoretic views than when evidence supported their views. When students' theories conflicted with the evidence presented, students tended to disregard the evidence and

base a response instead on their own theoretic views. Lord et al. (1979) also found that adults will accept only the evidence that confirms their initial position.

In the present study, mean ratings showed that students' prereading beliefs were neutral (e.g., between strongly disagree and strongly agree), although case-building was evident among several students. Nevertheless, case-building was not the main finding among students reading these persuasive texts. On the contrary, middle-school students were highly persuaded toward the author's view, regardless of prior held beliefs about the goodness of zoos. Thus, the overall findings did not seem to support Stein and Miller's (1993) theory regarding the impact of prior held beliefs on taking a position when middle-school students were presented with highly persuasive text containing emotional content.

Other research suggested that participants' domain knowledge is a controlling factor in belief change (Alexander, Murphy, Buehl, & Sperl, 1998; Alexander, et al., 2001; Buehl et al., 2001; Petty & Cacioppo, 1986). Alexander et al., (2001) demonstrated that domain knowledge among adults can influence the persuasiveness of written argument. For example, adult readers with higher levels of initial perceived knowledge were less likely to be persuaded toward the author's view after reading. Even when the author presented factual support for the view advocated, knowledgeable readers were not as persuaded. Alexander et al. suggested that when perceived domain knowledge is high, readers may be more motivated to critically analyze the argument being presented. Too much domain knowledge may lead to biased evidence weighing or case-building, limiting argument persuasiveness, whereas low domain knowledge may lead to being more readily persuaded (Alexander et al. 2001; Buehl et al., 2001; Kuhn et al., 1988;

Alexander et al., 1998; Petty & Cacioppo, 1986; Stein & Miller, 1991; Stein & Miller, 1993).

In the present study, the average middle-school readers' prereading perceived knowledge rating was moderate, in between "nothing at all" and "a whole lot." Yet, the prior knowledge that students perceived to have had did not appear to be related to belief change. Correlation analyses revealed that prereading perceived knowledge among middle-school students was not significantly related to prereading beliefs, content-specific beliefs, or postreading beliefs about keeping animals in zoos. In the present study, prereading perceived knowledge did not appear to be related to the beliefs of middle-school students before, during, or after reading persuasive text containing contentious argument. Students may have either perceived to have had more knowledge than actual or the content of the texts had a strong impact on their beliefs.

Recall that Stein and Miller (1991, 1993) suggested that participants' knowledge of the content of argument is a controlling factor in argument representation and belief change. Thus, students' belief change after reading persuasive text may be the result of students' lack of knowledge concerning the nature and content of persuasive text. The present findings indicated that a majority of students were unaware of the author's intention to persuade the reader. Therefore, it is highly likely that these middle-school students were unaware of the persuasive tactics authors use to convince the reader, such as the emotional appeals, which were present in the text they had read. Thus, it is possible that students were persuaded unaware of the author's intention and tactics used to do so.

Alexander et al. (2001) found evidence that the persuasiveness of an argument may depend upon how the author presents the topic, more emotionally or more factually.

Alexander et al. found that a refutational two-sided text that relied more on factual support was more persuasive in changing adult readers' initial beliefs than a refutational two-sided text that relied heavily on emotional appeals. However, reader's initial beliefs were already highly favorable toward the argument which relied on emotional appeals. It may be that emotional appeals are highly persuasive among adults because adults are less likely to be challenged by the article's content when it is framed emotionally rather than factually (Alexander et al., 2001). Likewise, when Murphy (2001) asked adults what the most persuasive text characteristics were, they indicated the presentation of multiple forms of evidence. Affect, or how the content presented evoked reader emotions, was the second most persuasive factor for adults (Murphy, 2001).

In the present study, middle-school students were more highly influenced by the emotionally appealing support presented by the author than by the factual support. This finding is not consistent with what we know about how persuasive content affects adults' beliefs (Alexander et al., 2001; Murphy, 2001). Overall, middle-school students appeared to change their beliefs considerably more after reading emotional content than after reading factual content. It appears that middle-school readers were more highly influenced by content presented to evoke readers' emotions than by factual content. Further, students perceived to have gained the most knowledge from the one-sided text which contained the most emotionally evoking evidence. It is quite possible that for middle-school students, text that evokes their emotions is remembered better than text that presents facts. Perhaps the examples of animals abuse evoked images that students responded to when they completed their ratings. Nonetheless, this finding extends the research in persuasion.

For middle-school students, persuasive content appeared to have much more of an impact on text persuasiveness than did students' prior held beliefs and perceived knowledge about zoos. This is probably the result of students' lack of experience with the functions of argument and persuasive techniques.

Knowledge of argument structure or sidedness is another type of background knowledge that could influence how a reader might mentally represent the argument in persuasive text, and thus be influenced by it. As the present findings have already indicated, most middle-school students did not have a schema for argument structure or its function in persuading them as readers. As a result, most middle-school students did not recognize the author's purpose to persuade and could not identify the author's argument. This lack of background knowledge, or schema, probably contributed to the dramatic change in beliefs toward the author's view after reading persuasive text.

In addition to the impact of reader variables, text variables may also have impacted middle-school students thinking. I discuss the impact of text sidedness on comprehension, evaluation, persuasiveness, and knowledge change relative to the existing literature next.

The Influence of Sidedness and Content in Persuasive Text

The present study investigated the impact of text sidedness on middle-school students' comprehension, evaluation, belief change, and knowledge change and found that sidedness and content had a significant influence in all analyses applicable except author's purpose identification. Research showed that adult readers responded differently depending upon sidedness and content in the persuasive text they had read (Alexander et al., 2001; Allen, 1991; Allen et al., 1990; Buehl et al., 2001; Hale et al., 1991; Murphy,

2001). In the present study, middle-school students read one of three texts containing one-sided argument, two-sided refutation, or two-sided nonrefutation, each containing different degrees of emotional and factual content. I discuss the influence of sidedness and content on middle-school students' comprehension, evaluation, belief change, and knowledge change in the next several sections.

The Influence of Sidedness in Identifying Argument

The present research adds to the comprehension literature information on how sidedness impacts middle-school students' comprehension of argument. Large group results revealed that sidedness had a significant impact on middle-school readers' comprehension. For instance, only those students who read the two-sided refutation text accurately identified the argument claim statement for the author's main point more often than selecting the topic statement. Murphy (2001) also found in her work with adults that when asked to state the author's main idea for persuasive articles structured as two-sided refutation and two-sided nonrefutation, participants were more likely to state the author's main point as a claim for the two-sided refutational articles than as a statement or a topic. These findings seem to indicate that the structure of two-sided refutation enhances the comprehension of argument for both adults and a majority of middle-school readers in the present study.

As with the identification of the author's main point, large group results revealed that text sidedness had an impact on readers' supporting detail selections. Only those students who read the two-sided refutation text identified the evidence statement for the author's supporting detail more often than selecting any of the other answer choices. Once again, two-sided refutation seemed to assist many students in identifying the

evidence presented in support of the author's claim. These findings contribute to the argument comprehension literature by adding to it comprehension research involving text sidedness among middle-school readers.

The present research also extends Chambliss and Murphy's (2002) proposed processing model to how middle-school students process three argument structures. Verbal protocol students who read the one-sided and two-sided refutation texts used macroprocessing to choose the author's claim as the main point or typically used the topic strategy to select the topic statement as the author's main point. Verbal protocol students reading the two-sided nonrefutation text typically used the presence of sides in the text (i.e., a structure strategy) to choose the topic statement as the main point. When asked to identify a supporting detail, verbal protocol students used the topic strategy or macroprocessing to select the topic statement or claim whereas other students relied on the importance of the content of the text (e.g., students explained it was stated in the text, they agreed with the statement selected, or they believed the statement selected was true). Whereas middle-school readers employed strategies and thought processes to identify the main point and supporting detail after reading the text, it was evident that they did not use the structure of argument or the claim-evidence relationship, as good readers do, to process the author's message in persuasive text, regardless of argument structure.

The Influence of Sidedness and Content in Evaluating Argument

Large group analyses revealed that sidedness and content influenced middle-school students' evaluations. Students in the large group who read the one-sided text indicated that they used the evidence presented in the text significantly more than students who read the two-sided refutation text and the two-sided nonrefutation. In

addition, students in the large group who read the two-sided nonrefutation text indicated that they used their prior knowledge and beliefs about zoos more than students who read the other texts. It appeared from large group findings that sidedness may have influenced students' ability to evaluate evidence even though the comprehension investigation revealed that they were unaware of the argument and its purpose in the text they had read.

Although sidedness appeared to influence students' argument evaluations, students' evaluations were also influenced by the emotional content in the text read. As indicated in Chapter 4, the actual difference in mean belief ratings between emotional and informational content was large reflecting the persuasiveness of emotionally evoking information among middle-school students. Recall that the one-sided text elaborated more on the instances of animal abuse that were included in all three texts. Thus, it is likely that the more the text contained emotionally evoking evidence, the more middle-school readers in the large group selected the evidence source to evaluate the premise statements. Even though students may have selected the evidence as a source for their rating, verbal protocol analyses revealed that students used their prior knowledge and/or their beliefs to evaluate the premise statements but selected the evidence answer choice in their task booklet. Further, students' evaluative reasoning was influenced by the premise statements themselves. For instance, when verbal protocol students disagreed with a premise statement, they used their beliefs and/or prior knowledge to evaluate it, disregarding the evidence presented in the text read. Future research involving more structured retroactive verbal protocol analyses could help to describe more thoroughly the influence of emotionally evoking evidence, as well as the influence of conflicting evidence and premise statements on students' evaluative reasoning.

The Influence of Sidedness and Content on Belief Change

This entire dissertation rests on extensive research suggesting that sidedness plays a significant role in persuading the adult reader. Research supports that the most effective persuasive texts for adults are those that include counterarguments and are structured as two-sided refutation, followed by one-sided persuasive text, and finally two-sided nonrefutation (Allen, 1991; Allen et al., 1990; Buehl et al., 2001; Hale et al., 1991; Murphy, 2001). For middle-school readers in the present study, the one-sided and two-sided refutation texts were significantly more persuasive than the two-sided nonrefutation text. But students' postreading beliefs increased toward the author's claim more dramatically after reading the one-sided text than the two-sided refutation text, results that do not match the work with adults. For middle-school readers in the present study, one-sided argument and two-sided refutation were indeed highly persuasive, but belief ratings rose to the highest level after reading the one-sided text. Based on these results, it appeared that presenting one side of an issue to most middle-school students effected greater agreement with the author's view.

However, the presence of refutation did seem to strengthen the author's argument to the point of rendering it nearly as persuasive as the one-sided text among middle-school students. This finding was not entirely consistent with findings among adult readers where the presence of refutation appeared to render two-sided refutation as the most persuasive structure (Allen et al., 1990; Buehl et al., 2001; Hale et al., 1991; Murphy, 2001). But consistent among middle-school readers and adults was the finding that two-sided nonrefutation was the least persuasive text structure (Buehl et al., 2001; Hale et al., 1991; Lord et al., 1979; Murphy, 2001).

Although the actual difference in mean belief ratings between texts was moderate, there was also a small difference in how students rated their beliefs after reading content-specific paragraphs in each text. The emotional content in the one-sided text and the two-sided refutation text was found to be more highly successful at changing middle-school readers' beliefs than the emotional content mentioned in the nonrefutation text. Although the same emotional content was included in all three texts, instances of animal abuse were more elaborated in the one-sided text than in the two-sided nonrefutation text, which resulted in the presence of a larger amount of emotional content in the one-sided text. This content may have influenced belief change between texts rather than text sidedness. It is also possible that students used biased assimilation when presented with two sides of the issue, as in the nonrefutation text, which would serve to strengthen their prior held beliefs rather than change them toward the author's view (Lord et al., 1979). Further research using verbal protocol analysis could help to illustrate the influence of sidedness and content on text persuasiveness.

The Influence of Sidedness and Content on Knowledge Change

Research showed that domain knowledge influences the persuasion process in adults (Alexander et al., 1998; Alexander, et al., 2001; Buehl et al., 2001; Kuhn et al., 1988; Petty & Cacioppo, 1986; Stein & Miller, 1991, 1993). Similarly, research showed that the sidedness in persuasive text influences adult readers' domain knowledge change (Buehl et al, 2001). Buehl et al. (2001) demonstrated that sidedness influenced readers' knowledge, but that the influence varied by text. The one-sided text increased adult readers' demonstrated knowledge, but the two-sided nonrefutation text influenced adult readers' demonstrated knowledge and perceived knowledge.

In the present study, middle-school students' postreading perceived knowledge ratings were significantly higher than mean prereading perceived knowledge ratings resulting in a very large effect size. Overall, the persuasive texts seemed to be very effective at changing readers' perceived domain knowledge. But perceived knowledge change varied by sidedness. For instance, middle-school students' mean ratings for perceived knowledge regarding zoos were significantly higher after reading the one-sided and two-sided nonrefutation than after reading the two-sided refutation text, this particular main effect was probably due to the higher rating students reading the nonrefutation text gave to their before-reading perceived knowledge causing the average perceived knowledge rating to look higher than the case might be for the nonrefutation text.. The interaction between sidedness and perceived knowledge revealed that students' postreading perceived knowledge ratings rose to the highest level after reading the one-sided text, then the two-sided refutation text, and finally the two-sided nonrefutation text. These findings seem to be congruent with the belief change findings of the present study and indicate that the more successful sidedness and content were at changing middle-school readers' beliefs, the more knowledge students perceived to have gained. As I wrote earlier, it is possible that for middle-school students, text that evokes their emotions is remembered better than text that presents facts. Perhaps the examples of animals abuse evoked images that students remembered after reading and responded to when they completed their perceived knowledge ratings. Further research using verbal protocol analysis and a demonstrated knowledge measure could help to illustrate how persuasive texts influence knowledge change relative to sidedness and content.

Directions for Future Research

This study investigated four aspects of middle-school students' critical reading in persuasive text: (a) comprehending written argument, (b) evaluating argument, (c) belief change and (d) knowledge change. I propose suggestions for future research within each of these areas with respect to measures, research design, and methodology.

Comprehending Written Argument

The present research was a large dissertation study which warranted the sole use of multiple-choice questions for assessing comprehension. I suggest that future research include comprehension measures comprised of both multiple-choice and written-response questions. Written response questions allow students to demonstrate what they have comprehended, which may increase the quality of inferences made from the results. Written-response questions could ask students to represent the author's main point and supporting details and then be scored on how close the representation comes to the argument structure used by the author or be scored for structural patterns (Chambliss, 1995; Chambliss & Murphy, 2002).

Where resources are an issue and multiple-choice questions seem warranted, future research should develop a multiple-choice comprehension measure comprised of at least three questions assessing the identification of author's purpose and at least three questions identifying the author's argument.

The present study provided only preliminary trends involving ability level and the comprehension of written argument because cell sizes were not adequate to statistically differentiate across class. The influence of ability level on comprehending argument should be explored further before valid inferences can be drawn. When class sizes are not

sufficient or classes are not grouped by reading ability, I suggest collecting reading performance scores from state reading assessments from which random selections can be made for statistical analyses.

The present study used an open structure when collecting verbal reports to investigate students' strategy use during and after reading. Verbal protocol analyses may be more informative when students are prompted to read to identify the author's main point and reasons, although the middle-school students in the present study did not appear to have the knowledge necessary to be strategic. Therefore, I would suggest that future research include both structured prompts and open-structure verbal protocol analysis.

Evaluating Argument

Knowing how students evaluate argument is imperative when developing instruction in critical reading. The present study revealed that while students believe they are using the evidence to evaluate argument, they may actually be using their own knowledge, beliefs, or feelings on the issue. I used multiple-choice questions in the large group study and verbal protocol analyses with a small group of students to explore students' evaluative reasoning. I suggest that future research counterbalance written-response and multiple-choice questioning with the large group and also collect structured verbal protocol analyses with a larger group of students to further investigate this likelihood. Verbal protocols may be more informative if students were prompted to evaluate rather than to report on what they were thinking.

In addition, the present study did not analyze the relationship of evaluative reasoning and beliefs regarding keeping animals in zoos. An analysis such as this could further illustrate how students evaluate argument when their prior held beliefs are in line

with the author's view and when they are not. I would suggest using written-response that could be scored using a similar coding scheme as the present study, or I would suggest collecting verbal reports with a larger group of students reading each text. Exploring how and when students engage in weighing evidence versus case building or biased evidence weighing could further illustrate how middle-school students evaluate argument.

The influence of reading ability on evaluating argument is also worthy of investigation. The present study revealed a significant difference in evaluative reasoning between low ability readers and higher ability readers, though this trend was only preliminary because of the small sample size. Therefore, I would make the same suggestion regarding ability level in future research that I made for comprehending written argument. When class sizes are not sufficient or classes are not grouped by reading ability, I suggest collecting reading performance scores from state reading assessments from which random selections can be made for statistical analyses.

Measuring Changing Beliefs and Knowledge

The present study assessed changes in students' beliefs relative to text sidedness but did not analyze group profiles. It would be informative to explore the profiles of the more or less persuaded students for differences in belief change for each text. Future research could analyze the influence of sidedness and content on highly persuaded readers, moderately persuaded readers, and the least persuaded middle-school readers to explore how much the particular text influenced their initial views (Buehl et al., 2001).

The present study assessed middle-school students' perceived knowledge but did not assess students' demonstrated knowledge. It would be most informative to assess students' perceived and demonstrated knowledge in future research that investigates

middle-school students' knowledge change because levels of both types of knowledge are relevant in belief change.

Measuring Effects of Text Sidedness

Text sidedness had a significant influence in all analyses except author's purpose. Two-sided refutation seemed to be the most successful at facilitating comprehension, whereas one-sided and two-sided refutation were the most persuasive. One-sided and two-sided refutation were also the most successful at facilitating perceived knowledge gain. Although text length and topic were held constant in the present study, the amount of emotional content differed with sidedness. Whereas research with adults has shown length did not matter, topic, sidedness, and content type influenced adults' beliefs and knowledge in various ways (Alexander et al., 2001; Buehl et al., 2001). I would recommend that future research continue to explore different versions of topic, text sidedness, and persuasive content in comprehension and persuasion among middle-school students as well as in naturally occurring text if available for middle-school students.

Measuring the Influence of Instruction

This study advanced the field of reading and persuasion by adding to it research in argument and persuasion among middle-school students. Whereas this study only introduced how middle-school students comprehend, analyze, and evaluate argument in persuasive text, it indicated that middle-school students need further instruction in critically reading, analyzing, and evaluating argument and persuasion. Therefore, I recommend that future research in these areas involve measuring the influence of instruction in argument and persuasion on reading comprehension and argument

evaluation. Various instructional approaches exist in the literature which I discuss in the next section.

Suggestions for Instruction

When the results of this study are interpreted in light of sidedness and content, this study informs instruction in argument and persuasion with middle-school readers. For instance, interpreting comprehension in light of sidedness helps to determine how argument structure influences the identification of author's purpose and argument, thereby informing the use of and comprehension instruction in argument structure and persuasive text with middle-school students. Analyzing how students evaluate emotional evidence organized by the author in different argument structures helps us to understand whether evaluating argument is influenced by sidedness and content, thereby informing instruction in argument evaluation. Interpreting changes in beliefs and perceived knowledge relative to sidedness and content also helps us to understand how text structures and persuasive content influence students' beliefs and knowledge, and therefore, which texts would be most effective for particular instructional goals with middle-school students.

The findings of this study lead to several obvious suggestions for instruction. First, I address instruction in comprehending argument and persuasion. Then, I address instruction in evaluating argument and persuasion.

Instruction in Argument and Persuasion

First, I suggest that students be explicitly taught the terms and strategies of argument and persuasion as a point of entry in an effective curriculum. Larson et al. (2004) found that a short tutorial on argument helped college students to identify the

argument when participants focused on the single goal of comprehending the argument. It was not helpful to these students to evaluate while reading to comprehend. Larson et al. concluded that instruction in the process of argument comprehension aided participants as long as they were not given the dual task of reading to evaluate. This suggests that instruction in understanding the author's argument should come prior to expecting students to evaluate. It also suggests that direct teaching of the concepts related to argument and persuasion would be beneficial to students.

Research indicates that teaching text structure strategies helps readers to understand the author's purpose and message in exposition. Expert readers employ text structure strategies to process exposition, by recognizing the author's signals to identify the main point and using the related text structure as a guide to plug in important information, thereby constructing a coherent representation of meaning (Dymock, 1998; Meyer & Poon, 2001; Richgels, McGee, Lomax & Sheard, 1987; Taylor & Samuels, 1983). However, if a reader is unaware of text structures, the reader does not have the strategic knowledge to use the author's rhetorical pattern to facilitate comprehension (Meyer & Poon, 2001).

A majority of students, elementary through college level, are unaware of expository text structures and do not possess the knowledge of how to use them to facilitate their own reading comprehension (Englert & Hiebert, 1984; Meyer & Poon, 2001; Richgels et al., 1987; Taylor & Samuels, 1983). Subsequently, research suggests that a reader's knowledge of text structures (textual schemata) will enhance text comprehension (Englert & Hiebert, 1984; Meyer & Poon, 2001; Richgels et al., 1987; Taylor & Samuels, 1983), that text structure can be identified (Meyer & Poon, 2001;

Chambliss & Calfee, 1998), and that awareness is teachable (Meyer & Poon, 2001; Taylor, 1985). It seems likely that argument structure would also be teachable.

Second, I suggest that all teachers engage their students in oral argumentation that is relevant to the student and the domain of study, thereby teaching students how to present a claim, provide support, consider opposing viewpoints, and so on. Reznitskaya et al. (2001, 2007) demonstrated that collaborative discussion was an effective context for the development and internalization of generalized knowledge of argumentation (argument schema). During collaborative reasoning, the teacher coaches students to take positions on each issue and to provide supporting reasons and evidence for their opinions, to challenge each other's viewpoints, offer counterarguments, respond to counterarguments with rebuttal, and ask for clarification as needed. In essence, the CR format teaches students argumentation skill so that it could be generalized to a new situation (Reznitskaya et al., 2001, 2007).

Third, I suggest that students' oral argumentation be composed into persuasive essays for their peers to analyze for effectiveness thereby enhancing awareness of the skills of written argument that could later be used to analyze other persuasive texts. Petit and Soto (2002) suggested an "argument workshop" where students progress from informal oral arguments to informal analyses of these arguments to formal argument composition and reading persuasive texts. In argument workshop, students move from creating spoken arguments relevant to them to analyzing their speech with respect to audience and argumentative strategies, to writing an argument to enhance awareness, and finally to reading and analyzing peer arguments for persuasive strategies presented in the

texts. After argument workshop, students are ready to read and analyze other persuasive texts (Petit & Soto, 2002).

In the present study, reading teachers in this middle school dedicated one to three weeks to comprehending argument in persuasive text. Additionally, writing teachers in this middle school taught persuasive composition. Although students received some instruction in reading and writing argument, the findings of the present study indicate that a majority of students did not recognize persuasive text and could not identify the basic parts of an author's argument (e.g., claim and evidence). Therefore, I suggest that middle-school teachers across subject areas teach a variety of reading strategies that assist students in recognizing and comprehending argument and persuasion in their subject-area content throughout the school year. Felton (2005) argued that for students to become critical thinkers, they must practice argumentation throughout the year by engaging in discussion with the arguments in their worlds. But argumentation must become a routine part of classroom discourse throughout the curriculum or it apparently will not transfer to students' thinking in all subjects. Short-term instruction in argument is a starting point, but to be effective, students must engage in real experiences with argumentation in history, science, and composition class (Felton, 2005).

Instruction in Evaluating Argument and Persuasion

The findings revealed that middle-school students do not differentiate between their own theories and the evidence presented and may not understand how their own theories relate to the argument presented by an author. Kuhn (1989) explained that having the knowledge of argument structure is fundamental to argumentative thinking, but metacognitive awareness and control is essential in the process, otherwise one's prior

beliefs may bias the evaluation of evidence. According to Kuhn, the minimum skills needed to evaluate evidence that bears on theory are: (a) the ability to identify the evidence and represent it separately from a representation of the theory, (b) the ability to think about the theory itself rather than to simply think with it, and (c) the ability to temporarily set aside one's acceptance of the theory, in order to evaluate the evidence and its bearing on the theory. Therefore, I suggest that teachers engage students in activities that help students to distinguish between what they know and believe on the issue at hand, what the author's argument is, and how these sources of information play a role in evaluating evidence. Instruction should include how to weigh evidence, how to guard against case building by putting judgments on hold until criteria for evaluation can be developed. Further, instruction in evaluating should be taught separately from instruction in comprehending argument (Larson et al., 2004). Finally, instruction should include persuasive techniques author's use to convince the reader, such as emotional appeals.

Whether or not middle-school students are cognitively ready to learn how to reason well was not addressed in the present study. However, Kuhn et al. (1988) found that sixth graders appeared to have the competence to explicitly evaluate the bearing of evidence on a theory but did not always weigh evidence correctly. For instance, approximately one-half to two-thirds of sixth graders made evidence-based responses showing that they had the ability to examine the evidence at some level of awareness in order to respond with supporting evidence. That sixth graders did not necessarily evaluate this evidence correctly but selectively supports Kuhn et al.'s theory that there is a gap between performance and competence. Reasons point to the possible influence of prior beliefs on evidence weighing when faced with conflicting evidence and theoretical

beliefs (Kuhn et al., 1988). It seems possible that with metacognitive training, middle-school students could develop along these lines (e.g. Brown, Campione, & Day, 1981; Brown, 1980; Armbruster & Brown, 1984; Baker & Brown, 1984; Paris, Lipson, & Wixson, 2004).

Selecting Texts

The choice of text is essential when planning for instruction, yet persuasive text that is written for middle-school students in grades six, seven, and eight is very hard to find, especially well-structured argument as I used in the present study. This was the case for the present study. The texts for this study underwent multiple rewrites in order to produce well structured one-sided and two-sided argument on a controversial topic that the youngest middle-school students could relate to. Selecting texts for instruction and learning may require that teachers construct or rewrite persuasive articles of interest to middle-school students.

When choosing a text for instruction, I would suggest that the text be supportive of whatever it is students are to take away from the lesson and the text. For instance, the present study revealed that a majority of middle-school students could not identify the author's argument in the texts read but that two-sided refutation aided middle-school students' comprehension of argument more so than one-sided text. Two-sided nonrefutation was the least facilitative, probably because students viewed it as a topic-detail structure used to inform readers. Based on this finding, I might suggest that instruction in argument comprehension begin with two-sided refutation text. Larson et al. (2004) noted that college participants required support from the author in the form of

strong signals for claims and evidence. It seems likely that middle-school students would also benefit from the author's use of signals.

Limitations

Several of my suggestions for future research discussed above stemmed from limitations in the present study. First, in order to run statistical tests involving class as a factor, it was necessary for me to take random samplings from heterogeneous and inclusion classes to match the number of students in gifted classes. But random sample sizes for each class were small ($n=19$). Because analyses involving class as a factor were based on such small random samples, the ability to make inferences based on the results was limited.

Second, the present study did not include a demonstrated knowledge measure, which could have provided more substantial evidence than a perceived knowledge measure alone provided, and from which claims could more confidently be drawn regarding knowledge change in persuasive text.

In addition, generalizability remains a limitation. The present findings may generalize to middle-school students between the ages of 11 and 15 with similar demographic and geographic characteristics. However, the results may differ at middle schools serving students of different grade levels, among middle-school students in more suburban or urban settings, or among more diverse populations.

Conclusion

Most middle-school students in the present study lacked knowledge of argument and persuasive techniques. Students similarly identified simple argument, complex argument, and unbiased argument containing emotional appeals as text written to inform,

suggesting that most middle-school students have no argument schema to which argument structures could be matched. Because most middle-school students were unaware of the author's purpose to persuade, they did not successfully identify the author's claim and evidence. The work of several researchers revealed that many children, high-school students, and adults do not have an argument schema beyond a simple claim and its evidence leading readers to have difficulty distinguishing between the basic parts of an argument (Chambliss, 1995; Chambliss & Murphy, 2002; Kuhn, 1992; Kuhn et al., 1988, Larson, et al., 2004). The findings for middle-school students in the present study appeared to be similar to both younger and older students. Their underdeveloped skills in argument most likely impacted how they evaluated premise statements related to the issue in the persuasive texts they read.

Students in the present study did not differentiate between reasoning based on evidence in the text and reasoning based on their prior knowledge and beliefs, sources outside the text read. Furthermore, findings suggested that middle-school students did not clearly differentiate between what is a claim and what is evidence and how the two elements relate in argument. Students may have selected "evidence" as the basis for their ratings because they have learned in school that evidence should be used to support their answers, and when supporting an answer, anything in the text counts as supporting evidence. In addition, verbal protocol students did not evaluate the argument in the text they had read, weighing the evidence presented against the author's claim. Rather, verbal protocol students appeared to take an anticipatory stance toward the content in the texts, where they expressed their thoughts about the circumstances in the text based on their beliefs, feelings or prior knowledge (Pressley & Afflerbach, 1995). Nevertheless,

analyses revealed that students considered the evidence when evaluating certain premise statements and relied more on their beliefs when evaluating others, indicating that they have the competence to reason but probably lack the skill with written persuasion.

Because students were not aware of the claim-evidence relationship in argument, or of how argument and emotional appeals works to persuade the reader, their initial beliefs were highly influenced by the one-sided argument, followed by the two-sided refutation text, and the emotional evidence presented. Perceiving the information presented in the texts read as important information on the topic of zoos, a majority of middle-school readers accepted the argument presented and significantly changed their initial beliefs. Students may have over estimated their prior knowledge of zoos, leading them to be highly persuaded toward the author's view (Alexander et al., 2001), but it is also likely that the emotional content of the texts had a stronger impact on their postreading beliefs than their prior knowledge and beliefs at prereading.

Children of all ages are constantly subjected to persuasion outside of school, but academic experiences with written persuasion are much more limited (Calfee & Chambliss, 1988; Chambliss & Calfee, 1989, 1998). The performance of middle-school readers revealed a lack of experience with persuasive text, yet students are expected to comprehend, analyze, and evaluate argument on state and national assessments. The present findings speak to the need for instruction in the critical reading of argument and persuasion in middle schools. A strong focus on recognizing text written to persuade and comprehending the argument within is needed, combined with a focus on developing students' metacognition for critically analyzing and evaluating the author's message.

Appendix A: Persuasive Articles and Argument Representations

One-sided (1S)

1,080 words

Zoos Harm Animals

Zoos may seem to be safe places for wild animals, places where they are protected, cared for, and admired. Unfortunately, the sad truth about zoos is that they hurt animals more than help them. The People for the Ethical Treatment of Animals (PETA) believe that zoos unjustly keep animals in captivity, away from their natural homes, in small areas where their natural needs are not met. As a result, the animals become bored and lonely. Zoo animals are often ignored and abused so that people can be entertained.

Kept in cramped areas, zoo animals cannot move around freely. A dolphin in the ocean, for example, travels fifty miles a day. That's the same as five hundred laps around a typical marine zoo pool. According to animal supporter, Jeffrey Masson, dolphins and whales are animals that normally live in the entire ocean. To confine them in marine zoos where space is very limited is, basically, to put them in prison. Land animals, most of whom are used to running great distances, also suffer from being confined. Birds' wings may be clipped so that they cannot fly. Because captive animals cannot move around freely, they don't get the exercise they need.

Even more important, zoo animals do not hunt for their food. Writer, Jared Diamond (1995), summarizes how this affects animals' lives:

In the wild, animals spend most of their time on food: searching for it, capturing it, processing it, and eating it, often in many small amounts at many different places...In zoos, though, food traditionally consists of prepared chow that requires no capturing or processing, placed in a pan that requires no finding, and provided once a day. The animal gobbles down the chow in 5 minutes, leaving it 23 hours and 55 minutes a day to be bored. (p. 83)

Zoo animals also suffer from not being able to socialize with other animals. For example, zoos do not allow animals to mate naturally, controlling carefully how they breed. And many animals who live in large herds or family groups in nature are kept alone or, at most, in pairs. As a result, zoo animals cannot take part in normal, social activities.

Because zoo animals cannot exercise, hunt for food, or socialize with other animals, they spend their time pacing back and forth and develop abnormal, self-destructive behaviors, or "zoochosis." If you examine an animal in captivity, its restlessness and boredom are obvious. For example, captive gorillas often vomit and reswallow their food. They may also eat their feces, become abnormally aggressive, or groom themselves far more than any wild animal would.

An Oxford University research team, who observed animals in captivity and in the wild for 40 years, seems to agree that confinement hurts wild animals. They found that captive animals such as polar bears, lions, tigers, and cheetahs show the most signs of stress and/or mental and emotional trouble. They recommended improving conditions or not keeping these types of wide-ranging carnivores in captivity. A PETA (People for the Ethical Treatment of Animals) study of many zoos across the country found that several types of bears were showing disturbed behaviors. These frustrated animals spend much of their time pacing or walking in tight circles. Others sway or roll their heads, or

show other signs of mental and emotional suffering. In some bear pens, paths worn by the bears' constant pacing can be seen. In others, there are actual paw impressions in the soil where bears have stepped in the same spot over and over again. These behaviors are not just signs of boredom. They indicate deep depression.

Zoo animals also suffer from being ignored by zoo keepers. When zoos must find ways to cut costs or add gimmicks that will attract visitors, animals are the ones who pay the price. Precious funds that should be used to provide more caring conditions for animals are often wasted on cosmetic improvements, such as landscaping or visitor centers, in order to draw visitors. Animals suffer from more than being ignored in some zoos. Rose-Tu, an elephant at the Oregon Zoo, suffered "176 gashes and cuts" caused by a zoo handler using a sharp metal rod. Another elephant, Sissy, was beaten with an ax handle at the El Paso Zoo. Zoo animals are often ignored and abused so that people can be entertained.

The animals on exhibit are not the only ones who suffer neglect and abuse by zoo keepers. Most zoos have an area that the public never gets to see. Here, rabbits, rats, mice, baby chicks, and other animals are raised and killed to provide food for the animals on display. According to one zoo volunteer, killing methods include neck-breaking and "bonking." Zookeepers place "feed" animals in plastic bags and slam their heads against a hard surface to induce fatal head injuries. Feed animals suffer abuse to keep zoo animals on display.

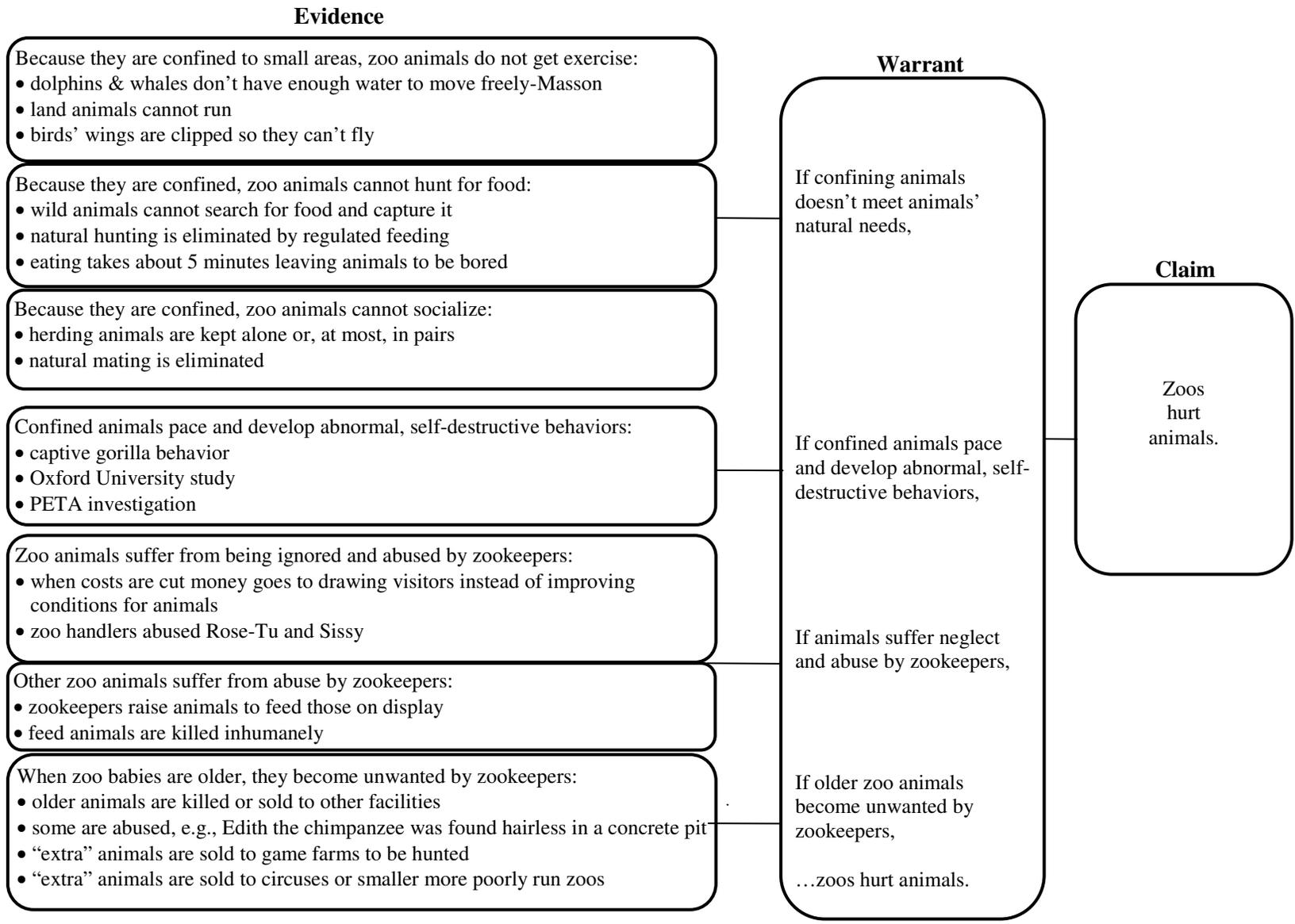
When zoo babies get older and attract fewer visitors, they become unwanted by zoo keepers. Many are sold or killed by zoos. A chimpanzee named Edith is one example of a discarded zoo baby who fell into the wrong hands. Born in the 1960s at the Saint Louis Zoo, baby Edith was surely an adorable sight for visitors. But just after her third birthday, she was taken from her family and passed around to at least five different facilities. Finally, she landed at a Texan roadside zoo called the Amarillo Wildlife Refuge (AWR). During an undercover investigation of AWR, PETA found Edith in a filthy, barren concrete pit. She was hairless and had been living on rotten produce and dog food. When deer, tigers, lions, and other animals who breed frequently are no longer babies, they are sometimes sold to "game" farms where hunters pay for the "privilege" of killing them. Some are killed for their meat and/or hides. Other "extra" animals may be sold to circuses or smaller, more poorly run zoos where they may suffer further neglect and abuse.

Zoos unfairly keep animals locked up in captivity. Captive animals become bored, cramped, and lonely. They are deprived of all control over their lives and are far from their natural homes. We don't need zoos to learn about animals. We have informative television programming, access to the Internet, and the ability to travel to other countries. Learning about or viewing animals in their natural habitats can be as simple as a flick of a switch or a hike up a mountain. The idea of keeping animals confined is outdated.

Diamond, Jared. (1995). Playing God at the zoo. *Discover*, March 1995, p.83.

Dudley, W. (2006). Introducing Issues with Opposing Viewpoints Series, *Animal Rights*. New York: Greenhaven Press.

Hurley, J. A. (1999). Zoos Harm Animals. Opposing Viewpoints Digests Series, *Animal Rights*. Retrieved October 23, 2006, from the Opposing Viewpoints Resource Center at <http://galenet.galegroup.com>
People for the Ethical Treatment of Animals. (2006). Zoos: Pitiful prisons. Retrieved August 8, 2006, from http://www.peta.org/mc/factsheet_display.asp?ID=67&pf=true.



A Graphic Representation of the One-sided Argument Structure for “Zoos Harm Animals.”

Zoos Are Cruel

Zoos may seem to be safe places for wild animals, places where they are protected, cared for, and admired. Unfortunately, the sad truth about zoos is that they hurt animals more than help them. Although John Ironmonger, author of *The Good Zoo Guide*, believes that well-run zoos help animals, the People for the Ethical Treatment of Animals (PETA) believe that zoos unfairly keep animals in small areas, away from their natural homes, which harms animals.

According to Ironmonger, people cannot always assume that taking an animal away from its natural habitat is cruel. It may not be true, for example, that a wolf that sleeps all day in a zoo is less happy than a wild wolf who spends most of its time searching for food. Similarly, it may be unfair to think that keeping animals confined in small areas is cruel. In most zoos, the purpose of confinement is to separate animals at night to keep them from physical harm.

But PETA argues that zoo animals suffer from being kept in small areas because their natural needs are rarely met. Confined in cramped areas, zoo animals cannot move freely. A dolphin in the ocean, for example, travels fifty miles a day. That's the same as five hundred laps around a typical marine zoo pool. According to animal supporter, Jeffrey Masson, dolphins and whales normally live in the entire ocean. To confine them in marine zoos is, basically, to put them in prison. Land animals, most of whom are used to running great distances, also suffer from being confined. Because captive animals cannot move around freely, they don't get the exercise they need and they cannot socialize with other animals.

Even the most "natural" zoo exhibits fail to provide the most important element of nature: Zoo animals do not hunt for their food. Writer, Jared Diamond (1995), summarizes how this affects animals' lives:

In the wild, animals spend most of their time on food: searching for it, capturing it, processing it, and eating it, often in many small amounts at many different places...In zoos, though, food traditionally consists of prepared chow that requires no capturing or processing, placed in a pan that requires no finding, and provided once a day. The animal gobbles down the chow in 5 minutes, leaving it 23 hours and 55 minutes a day to be bored. (p. 83)

Because zoo animals cannot exercise, hunt for food, or socialize with other animals, they spend their time pacing back and forth and develop abnormal, self-destructive behaviors, or "zoochosis." For example, captive gorillas often vomit and reswallow their food. They may also eat their feces, become abnormally aggressive, or groom themselves far more than any wild animal would.

An Oxford University research team, who observed animals in captivity and in the wild for 40 years, seems to agree that confinement hurts animals. They found that captive animals such as polar bears, lions, tigers, and cheetahs show the most signs of stress and/or mental and emotional trouble. They recommended improving conditions or not keeping these types of carnivores in captivity. A PETA study of many zoos found that several types of bears were showing disturbed behaviors. These frustrated animals spend much of their time pacing or walking in tight circles. Others sway or roll their heads, or show other signs of mental and emotional suffering. In some bear pens, paths worn by the bears' constant pacing can be seen. In others, there are actual paw impressions in the soil

where bears have stepped in the same spot over and over again. These behaviors are not just signs of boredom. They indicate deep depression.

On the other hand, Ironmonger believes that most zoo keepers are true animal lovers. Most zookeepers believe that animals in their charge are satisfied and as 'happy' as their wild relations. Certainly zoo animals live healthier lives. Zoo animals live longer lives, feed better, and suffer from fewer parasites or diseases. They live without the fear of being preyed upon, and they live without food shortages and famine.

However, PETA argues that zoo animals suffer neglect and abuse in the hands of zoo keepers. For example, when zoos must find ways to attract visitors, the animals are ignored. Funds that should be used to provide more caring conditions for animals are often wasted on improvements, such as landscaping or visitor centers, in order to draw visitors. According to PETA, animals suffer from more than being ignored in some zoos. Rose-Tu, an elephant at the Oregon Zoo, suffered "176 gashes and cuts" caused by a zoo handler using a sharp metal rod. Another elephant, Sissy, was beaten with an ax handle at the El Paso Zoo. The animals on exhibit are not the only ones who suffer neglect and abuse by zookeepers. Feed animals, such as rabbits, rats, mice, baby chicks, and other animals are raised and killed in cruel ways to provide food for the animals on display.

When zoo babies get older and attract fewer visitors, they become unwanted by zookeepers. Many are sold or killed by zoos. A chimpanzee named Edith is one example of a discarded zoo baby. Born in the 1960s at the Saint Louis Zoo, baby Edith was surely an adorable sight for visitors. But just after her third birthday, she was taken from her family and passed around to at least five different zoos. She finally landed at a Texan roadside zoo. During an undercover investigation of this zoo, PETA found Edith in a filthy, barren concrete pit. She was hairless and had been living on rotten produce and dog food. When deer, tigers, lions, and other animals who breed often are no longer babies, they are sometimes sold to "game" farms for hunters to kill for sport, meat, or animal hide. Other "extra" zoo animals may be sold to circuses or smaller, more poorly run zoos where conditions are not suitable. Zoo animals suffer from neglect and abuse in the hands of zookeepers.

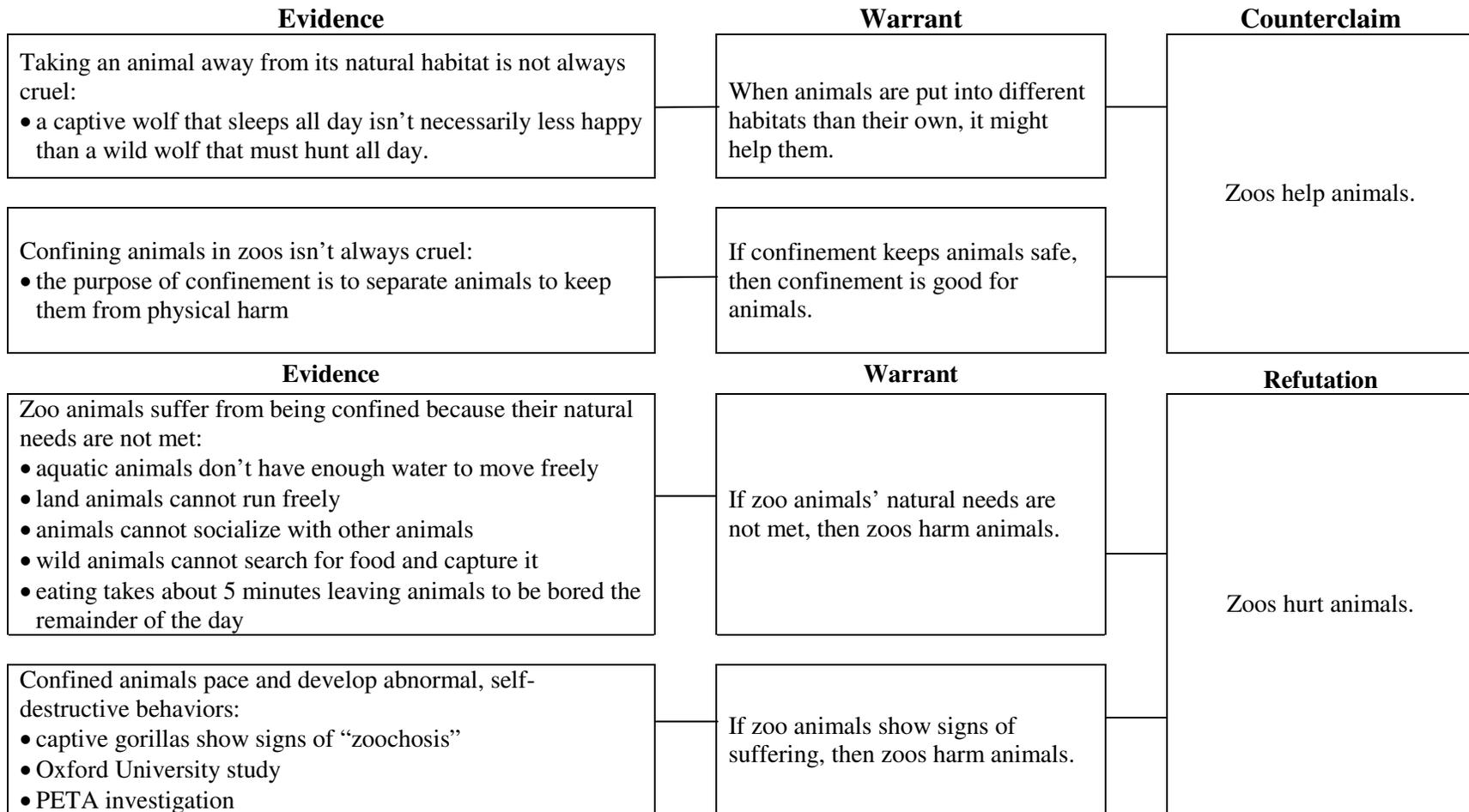
Despite what Ironmonger argues, zoos unfairly keep animals locked up in captivity. Captive animals become bored, cramped, and lonely. They are deprived of all control over their lives and are far from their natural homes. We don't need zoos to learn about animals. We have informative television programming, access to the Internet, and the ability to travel to other countries. Learning about or viewing animals in their natural habitats can be as simple as a flick of a switch. The idea of keeping animals confined is outdated.

Diamond, Jared. (1995). Playing God at the zoo. *Discover*, March 1995, p.83.

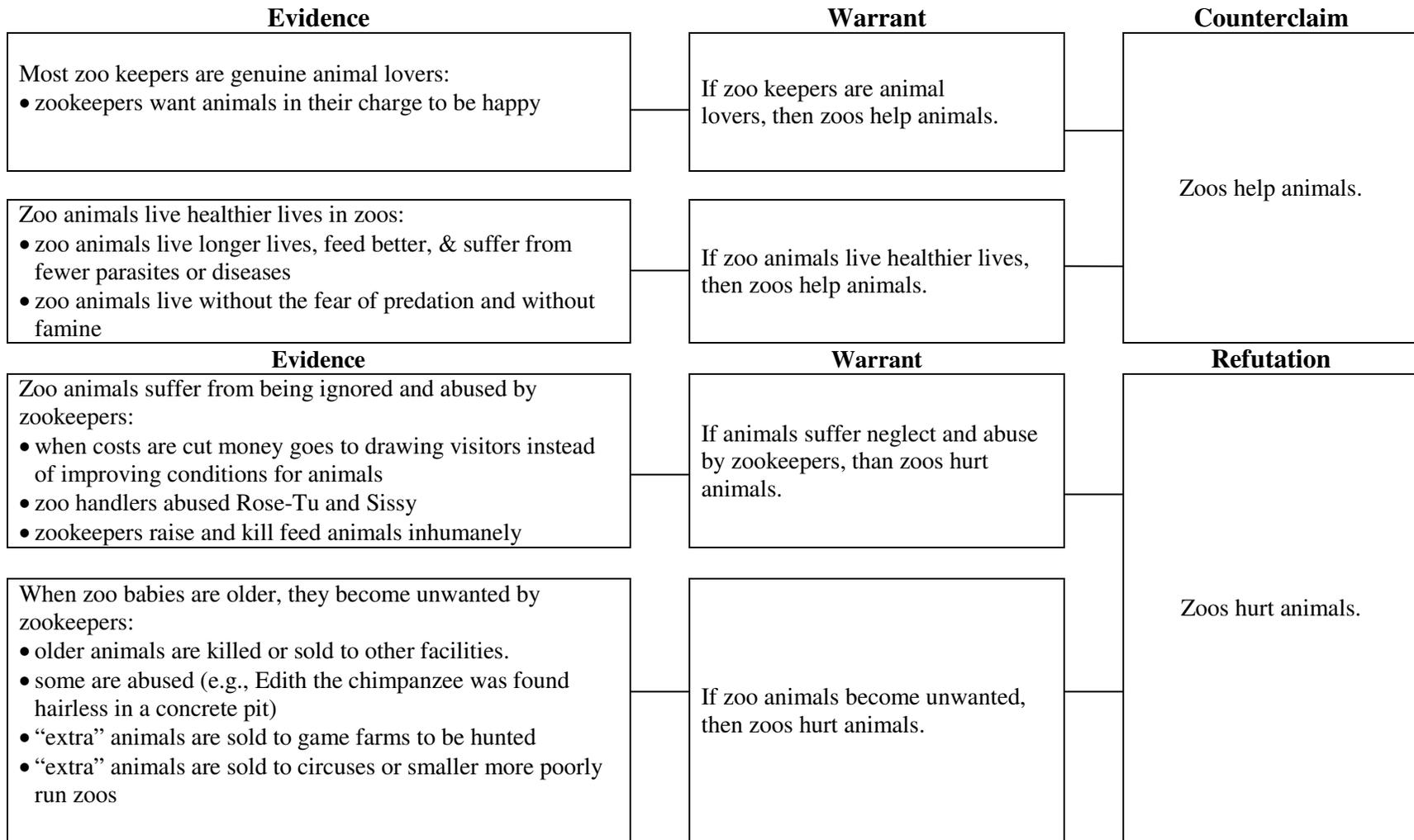
Dudley, W. (2006). Introducing Issues with Opposing Viewpoints Series, *Animal Rights*. New York: Greenhaven Press.

Hurley, J. A. (1999). Zoos Harm Animals. Opposing Viewpoints Digests Series, *Animal Rights*. Retrieved October 23, 2006, from the Opposing Viewpoints Resource Center at <http://galenet.galegroup.com>
People for the Ethical Treatment of Animals. (2006). Zoos: Pitiful prisons. Retrieved August 8, 2006, from http://www.peta.org/mc/factsheet_display.asp?ID=67&pf=true.

A Graphic Representation of the Two-Sided Refutational Argument Structure for “Zoos Are Cruel.”



A Graphic Representation of the Two-Sided Refutational Argument Structure for “Zoos Are Cruel” (cont.)



Are Zoos Cruel?

Zoos may seem to be safe places for wild animals, places where they are protected, cared for, and admired. Unfortunately, zoos also seem to hurt animals more than help them. Animal supporters and scientists disagree on whether or not zoos help or harm animals. John Ironmonger, author of *The Good Zoo Guide*, a guide that rates zoos in Great Britain based on their treatment of animals, supports good zoos because well-run zoos help animals. The People for the Ethical Treatment of Animals (PETA) believe that zoos unjustly keep animals in captivity, away from their natural homes, which ultimately harms animals.

John Ironmonger writes that most zoo keepers are genuine animal lovers who want animals to be 'happy'. Most zoo keepers believe that animals in their charge are contented and as 'happy' as their wild relations. They believe, for example, that a wolf that sleeps all day in a zoo could be just as happy if not more content than a hungry wolf who must spend a majority of its time searching for food in the wild. Most zoo keepers want the animals they take care of to live 'happy' lives.

Ironmonger also argues that well-run zoos help animals live healthier lives. There is evidence that zoo animals tend to live longer lives, to feed better, and to suffer from fewer parasites or diseases than their wild relations. Zoo animals live without the fear of being hunted by other animals or humans, which they must guard against in the wild. Zoo animals also live without famine or food shortages because zoos provide the food necessary for a healthy existence.

Zoos also help animals by providing them with an environment that animals often prefer over their natural wild habitat. Zoologists have found that it is not always the case that animals are happiest in an environment that mimics their own wild habitat. For example, scimitar-horned oryxes normally have to find ways to survive in the semi-desert scrubland of the Sahara. But they do not necessarily choose or enjoy this harsh environment. On the contrary, they have been forced to live on the scrublands at the edge of their natural environment by other species who have out-competed them. Without a doubt, the scimitar-horned oryx appears to be in heaven among the green meadows of Marwell Zoo in southern England rather than the scrublands on which they've been forced to live. In this case, Marwell Zoo provides the scimitar-horned oryx with a better environment among green meadows than its wild counterparts who are forced to search for food among the scrublands.

Other animals as well seem to prefer habitats other than their own natural habitat. For example, when we think of lions, we think of tropical, warmth-loving animals. However, zoos like Chester in the North of England offer their lions the option every winter day of centrally heated enclosures, or the cold winds of Cheshire. They almost always choose to put up with the cold temperatures, even preferring ice and snow to the warmth of their indoor home. These animals clearly favor environments that are not the same as their natural wild habitats. But the environments that some animals prefer can only be provided by zoos.

PETA has a different view pointing out that zoo animals suffer because their natural needs are rarely met. For example, birds' wings may be clipped so that they cannot fly. Aquatic zoo animals, like dolphins and whales, are often without enough

water to move freely. Many aquatic and land animals who live in large herds or family groups in nature are kept alone or in pairs in zoos. Their natural hunting and mating behaviors have been replaced by regulated feeding and breeding schedules so that zoo animals cannot hunt and mate naturally. Because zoo animals are kept in small areas where their natural needs cannot be met, they often develop abnormal and self-destructive behaviors, or “zoochosis.”

An Oxford University research team, who observed animals in captivity and in the wild for 40 years, seems to agree that animals suffer from being confined in small areas. They found that captive animals such as polar bears, lions, tigers, and cheetahs show the most signs of stress and/or mental and emotional trouble. They recommended either improving conditions for these animals or not keeping these types of wide-ranging carnivores in captivity. A PETA study of many zoos across the country found that several types of bears were showing disturbed behaviors. These frustrated animals spend much of their time pacing or walking in tight circles. Others sway or roll their heads, or show other signs of mental and emotional suffering. In some bear pens, paths worn by the bears’ constant pacing can be seen. In others, there are actual paw impressions in the soil where bears have stepped in the same spot over and over again. Keeping animals in captivity appears to cause suffering in many wild animals.

Zoo animals also suffer from being ignored and abused by zoo keepers. When zoos are short on funds, the money is often spent on attracting visitors rather than improving conditions for the animals on display. Improvements to zoos are often made, such as landscaping or visitor centers, in order to draw visitors first. The animals on exhibit are not the only ones who suffer. While reports of animal abuse to display animals by zookeepers have been recorded, feed animals suffer from abuse as well. Rabbits, rats, mice, baby chicks, and other animals that are raised to provide food for the animals on display are killed in cruel ways.

When young display animals get older and attract fewer visitors, they become unwanted by zookeepers. Many are sold or killed by zoos. Deer, tigers, lions, and other zoo animals who breed often become “extra” animals when they are no longer babies and are sometimes sold to “game” farms for hunters to kill. Other “extra” zoo animals may be sold to circuses or smaller, more poorly run zoos where animals are often neglected and abused.

Animal supporters disagree on whether or not holding animals captive in zoos helps or harms animals. John Ironmonger supports good zoos and opposes bad ones. He believes that well-run zoos do not violate animals’ rights because well-run zoos help animals to live better lives. PETA’s view points out that zoo unjustly keep animals in captivity, away from their natural homes, which causes animals to become depressed. They also claim that many zoo animals are neglected and abused.

Diamond, Jared. (1995). Playing God at the zoo. *Discover*, March 1995, p.83.

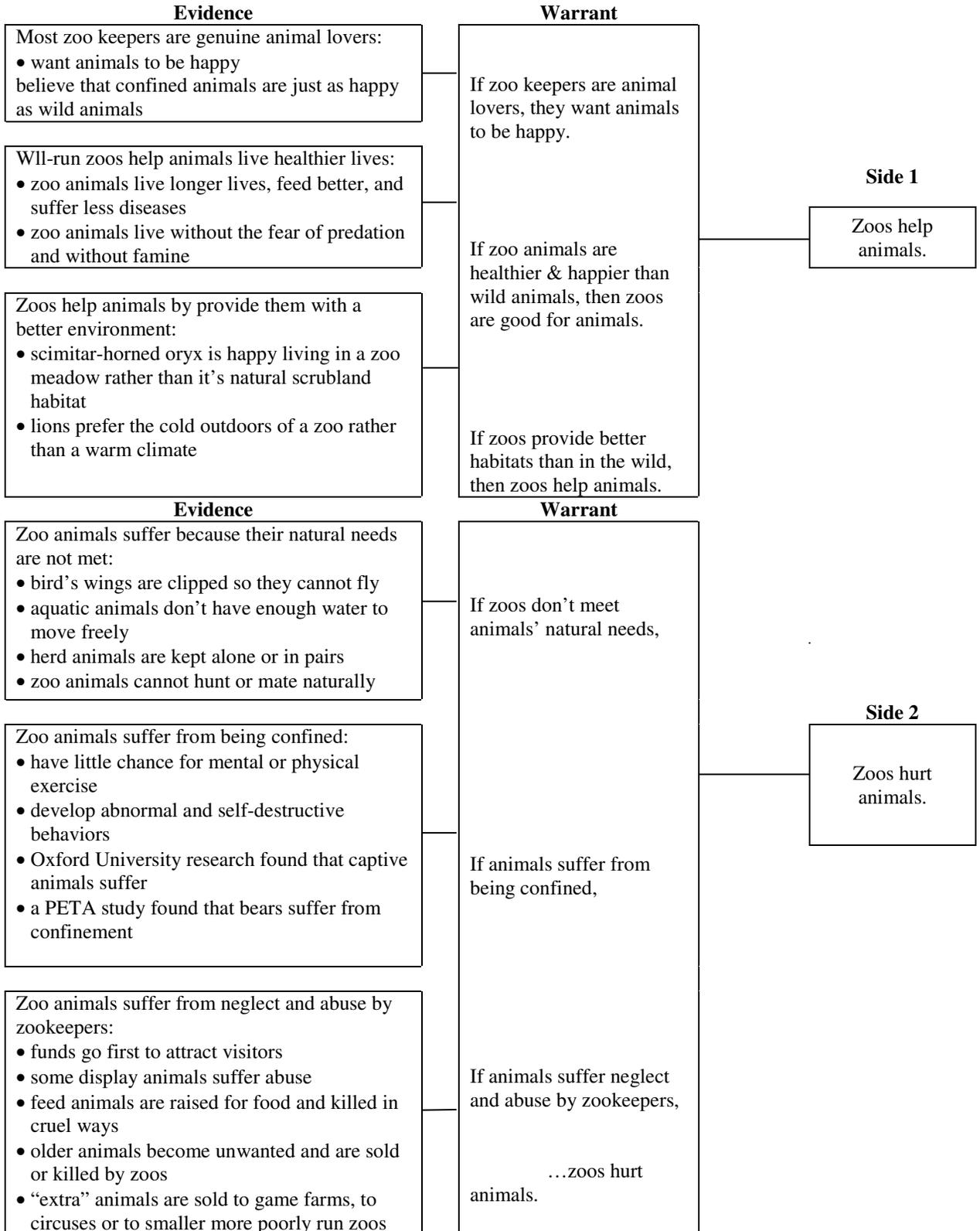
Dudley, W. (2006). Introducing Issues with Opposing Viewpoints Series, *Animal Rights*. New York: Greenhaven Press.

Hurley, J. A. (1999). Zoos Harm Animals. Opposing Viewpoints Digests Series, *Animal Rights*. Retrieved October 23, 2006, from the Opposing Viewpoints Resource Center at <http://galenet.galegroup.com>

People for the Ethical Treatment of Animals. (2006). Zoos: Pitiful prisons. Retrieved August 8, 2006, from http://www.peta.org/mc/factsheet_display.asp?ID=67&pf=true.

A Graphic Representation of the Two-sided Nonrefutational Structure for “Are Zoos Cruel?”

Main Claim: Experts disagree on keeping animals in zoos.



Reading Task Booklet 1S

Directions:

The prereading questions begin on the next page. Answer these questions before you read the article. Then, turn the page to the article about zoos and read it carefully. After reading the article, be sure to answer the questions in the order they appear. It's important that you not change any questions you've already answered before reading the article. Also, please do not look back at what you have already done or look ahead in the task booklet. When you've answered the last question, close your booklet on your desk.

Before Reading
Section A: Demographics

Instructions: Please answer the following questions so that I will be able to describe the students who have completed the reading tasks.

1. What sex are you? **(Circle one.)** Female or Male

2. What is your birth date? _____/_____/_____
Month / Day / Year

3. What is your race or ethnicity? **(Circle one or more.)**

African American

American Indian

Alaskan

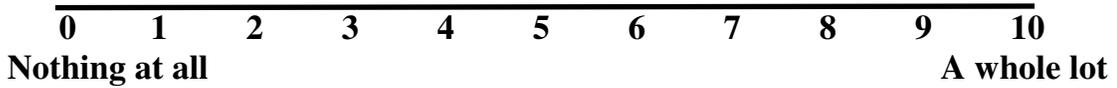
Asian

Hispanic or Latino

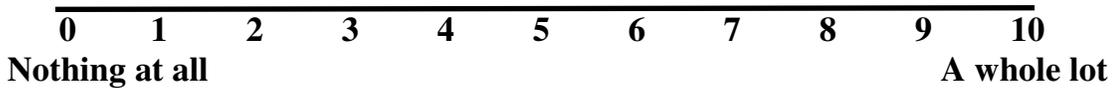
White

Before Reading
Section B: Knowledge Ratings

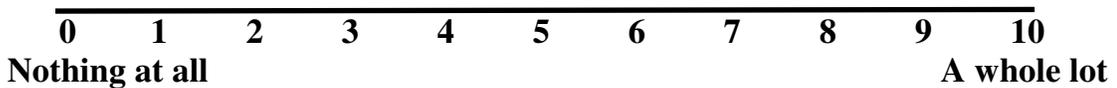
1. Place an **X** above the number on the line running from **nothing at all** to a **whole lot** to show what you know about how zoos take care of animals.



2. Place an **X** above the number on the line running from **nothing at all** to a **whole lot** to show what you know about why people like zoos.



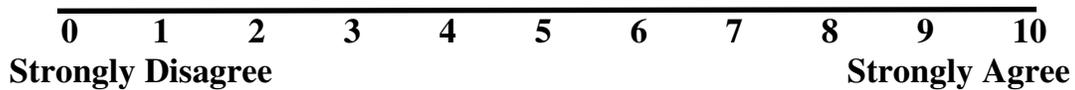
3. Place an **X** above the number on the line running from **nothing at all** to a **whole lot** to show what you know about how zoos affect animals' lives.



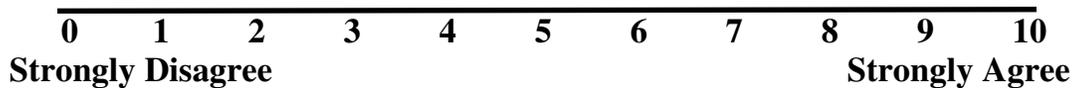
Before Reading
Section C: Belief Ratings

Instructions: Place an **X** above the number on the line running from **strongly disagree** to **strongly agree** to show how strongly you agree or disagree with each statement.

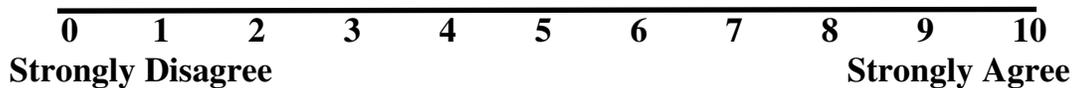
1. “Animals should be kept in zoos to entertain and educate people.”



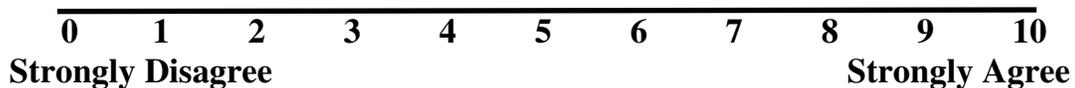
2. “Animals have a better life in zoos than in their natural environment.”



3. “Animals shouldn’t be kept in zoos because zoos are harmful to animals.”



4. “We don’t need zoos to learn about wild animals when we have TV and the Internet.”



During Reading
Section D: Article Reading

Instructions: Please read the following article about zoos carefully. Complete the 4 ratings as you read by placing an **X** above the number on the line running from **not at all** to **a whole lot** to show how much your mind has changed about zoos. Then answer the questions that follow.

Zoos Harm Animals

Zoos may seem to be safe places for wild animals, places where they are protected, cared for, and admired. Unfortunately, the sad truth about zoos is that they hurt animals more than help them. The People for the Ethical Treatment of Animals (PETA) believe that zoos unjustly keep animals in captivity, away from their natural homes, in small areas where their natural needs are not met. As a result, the animals become bored and lonely. Zoo animals are often ignored and abused so that people can be entertained.

Kept in cramped areas, zoo animals cannot move around freely. A dolphin in the ocean, for example, travels fifty miles a day. That's the same as five hundred laps around a typical marine zoo pool. According to animal supporter, Jeffrey Masson, dolphins and whales are animals that normally live in the entire ocean. To confine them in marine zoos where space is very limited is, basically, to put them in prison. Land animals, most of whom are used to running great distances, also suffer from being confined. Birds' wings may be clipped so that they cannot fly. Because captive animals cannot move around freely, they don't get the exercise they need.

Place an **X** above the number on the line to show how much your mind has changed about zoos after reading this paragraph.

0 1 2 3 4 5 6 7 8 9 10

Not at all **A whole lot**

Even more important, zoo animals do not hunt for their food. Writer, Jared Diamond, summarizes how this affects animals' lives:

In the wild, animals spend most of their time on food: searching for it, capturing it, processing it, and eating it, often in many small amounts at many different places...In zoos, though, food traditionally consists of prepared chow that requires no capturing or processing, placed in a pan that requires no finding, and provided once a day. The animal gobbles down the chow in 5 minutes, leaving it 23 hours and 55 minutes a day to be bored.

Zoo animals also suffer from not being able to socialize with other animals. For example, zoos do not allow animals to mate naturally, controlling carefully how they breed. And many animals who live in large herds or family groups in nature are kept alone or, at most, in pairs. As a result, zoo animals cannot take part in normal, social activities.

Place an **X** above the number on the line to show how much your mind has changed about zoos after reading this paragraph.

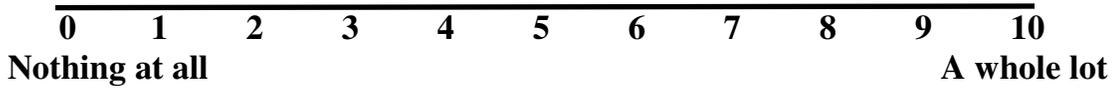
0 **1** **2** **3** **4** **5** **6** **7** **8** **9** **10**
Not at all **A whole lot**

Because zoo animals cannot exercise, hunt for food, or socialize with other animals, they spend their time pacing back and forth and develop abnormal, self-destructive behaviors, or “zoochosis.” If you examine an animal in captivity, its restlessness and boredom are obvious. For example, captive gorillas often vomit and reswallow their food. They may also eat their feces, become abnormally aggressive, or groom themselves far more than any wild animal would.

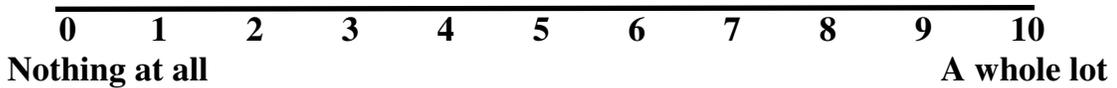
An Oxford University research team, who observed animals in captivity and in the wild for 40 years, seems to agree that confinement hurts wild animals. They found that captive animals such as polar bears, lions, tigers, and cheetahs show the most signs of stress and/or mental and emotional trouble. They recommended improving conditions or not keeping these types of wide-ranging carnivores in captivity. A PETA (People for the Ethical Treatment of Animals)

After Reading
Section E: Knowledge Ratings

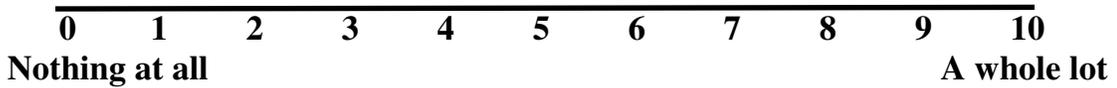
1. Place an **X** above the number on the line running from **nothing at all** to a **whole lot** to show what you know about how zoos take care of animals.



2. Place an **X** above the number on the line running from **nothing at all** to a **whole lot** to show what you now know about why people like zoos.



3. Place an **X** above the number on the line running from **nothing at all** to a **whole lot** to show what you now know about how zoos affect animals' lives.



After Reading
Section F: Belief Ratings

Instructions: Place an **X** above the number on the line running from **strongly disagree** to **strongly agree** to show how strongly you agree or disagree with these 4 statements **after** reading the article. Then, read the 3 reasons given below each rating and place an **X** next to the **ONE** that **best** supports your thinking **after** you've read the article.

1. "Animals should be kept in zoos to entertain and educate people."

0 1 2 3 4 5 6 7 8 9 10

Strongly Disagree **Strongly Agree**

_____ (1) I rated the above statement based mostly on the evidence presented in this article.

_____ (2) I rated the above statement based mostly on what I already know about zoos.

_____ (3) I rated the statement based mostly on what I believe or feel is true about zoos.

2. "Animals have a better life in zoos than in their natural environment."

0 1 2 3 4 5 6 7 8 9 10

Strongly Disagree **Strongly Agree**

_____ (1) I rated the above statement based mostly on the evidence presented in this article.

_____ (2) I rated the above statement based mostly on what I already know about zoos.

_____ (3) I rated the statement based mostly on what I believe or feel is true about zoos.

3. “Animals shouldn’t be kept in zoos because zoos are harmful to animals.”

0 1 2 3 4 5 6 7 8 9 10
Strongly Disagree **Strongly Agree**

_____ (1) I rated the above statement based mostly on the evidence presented in this article.

_____ (2) I rated the above statement based mostly on what I already know about zoos.

_____ (3) I rated the statement based mostly on what I believe or feel is true about zoos.

4. “We don’t need zoos to learn about wild animals when we have TV and the Internet.”

0 1 2 3 4 5 6 7 8 9 10
Strongly Disagree **Strongly Agree**

_____ (1) I rated the above statement based mostly on the evidence presented in this article.

_____ (2) I rated the above statement based mostly on what I already know about zoos.

_____ (3) I rated the statement based mostly on what I believe or feel is true about zoos.

After Reading
Section G: Comprehension Questions

Instructions: Place an **X** on the line next to the **best** answer for each question.

1. Which statement below best represents the author's **main** purpose for writing this article?

_____ (1) to persuade the reader by presenting an argument for or against something

_____ (2) to inform the reader of something by presenting lots of facts

_____ (3) to provide an explanation of something by presenting lots of examples

_____ (4) to entertain the reader by sharing an interesting or thoughtful story

2. What is the author's **main** point in the article just read?

_____ (1) zoos and their treatment of animals

_____ (2) zoos do not treat animals fairly

_____ (3) frustrated zoo animals pace back and forth

_____ (4) experts disagree on keeping animals in zoos

_____ (5) well-run zoos help animals in many ways

3. Which statement represents a **detail** that the author used to support his main point?

_____ (1) zoos and their treatment of animals

_____ (2) zoos do not treat animals fairly

_____ (3) frustrated zoo animals pace back and forth

_____ (4) experts disagree on keeping animals in zoos

_____ (5) well-run zoos help animals in many ways

You are finished. Please close your task booklet. Thank-you for participating!

Reading Task Booklet 2SR

Directions:

The prereading questions begin on the next page. Answer these questions before you read the article. Then, turn the page to the article about zoos and read it carefully. After reading the article, be sure to answer the questions in the order they appear. It's important that you not change any questions you've already answered before reading the article. Also, please do not look back at what you have already done or look ahead in the task booklet. When you've answered the last question, close your booklet on your desk.

Before Reading
Section A: Demographics

Instructions: Please answer the following questions so that I will be able to describe the students who have completed the reading tasks.

1. What sex are you? **(Circle one.)** Female or Male

2. What is your birth date? _____/_____/_____
Month / Day / Year

3. What is your race or ethnicity? **(Circle one or more.)**

African American

American Indian

Alaskan

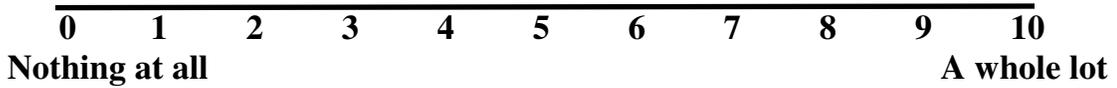
Asian

Hispanic or Latino

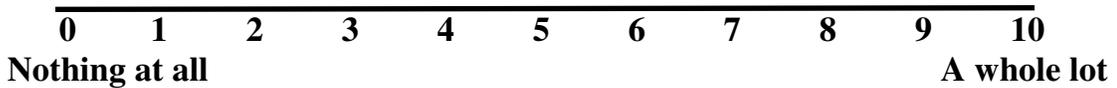
White

Before Reading
Section B: Knowledge Ratings

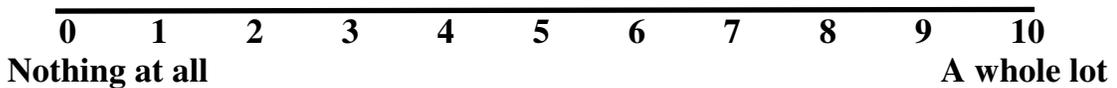
1. Place an **X** above the number on the line running from **nothing at all** to a **whole lot** to show what you know about how zoos take care of animals.



2. Place an **X** above the number on the line running from **nothing at all** to a **whole lot** to show what you know about why people like zoos.



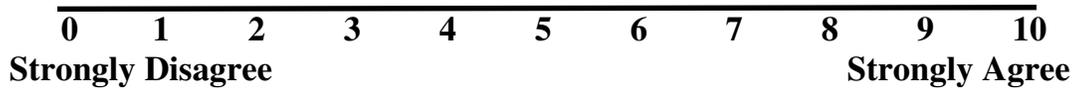
3. Place an **X** above the number on the line running from **nothing at all** to a **whole lot** to show what you know about how zoos affect animals' lives.



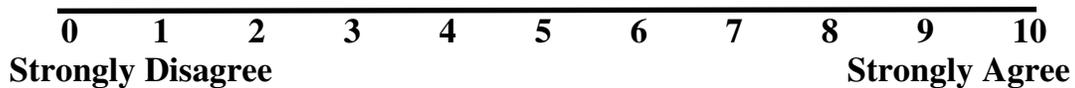
Before Reading
Section C: Belief Ratings

Instructions: Place an **X** above the number on the line running from **strongly disagree** to **strongly agree** to show how strongly you agree or disagree with each statement.

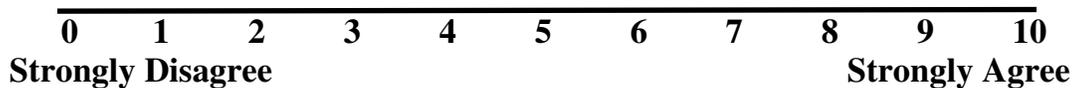
1. “Animals should be kept in zoos to entertain and educate people.”



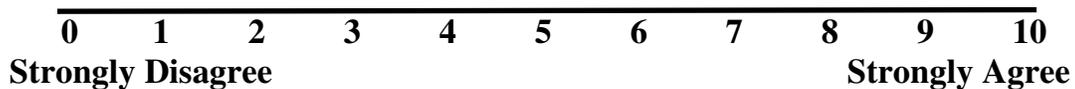
2. “Animals have a better life in zoos than in their natural environment.”



3. “Animals shouldn’t be kept in zoos because zoos are harmful to animals.”



4. “We don’t need zoos to learn about wild animals when we have TV and the Internet.”



was hairless and had been living on rotten produce and dog food. When deer, tigers, lions, and other animals who breed often are no longer babies, they are sometimes sold to “game” farms for hunters to kill for sport, meat, or animal hide. Other “extra” zoo animals may be sold to circuses or smaller, more poorly run zoos where conditions are not suitable. Zoo animals suffer from neglect and abuse in the hands of zookeepers.

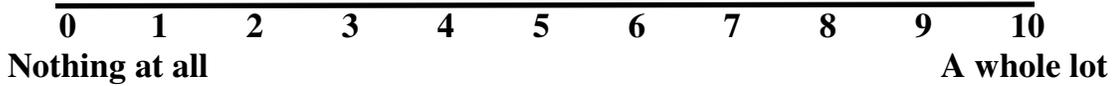
Place an **X** above the number on the line to show how much your mind has changed about zoos after reading this paragraph.

0	1	2	3	4	5	6	7	8	9	10
Not at all										A whole lot

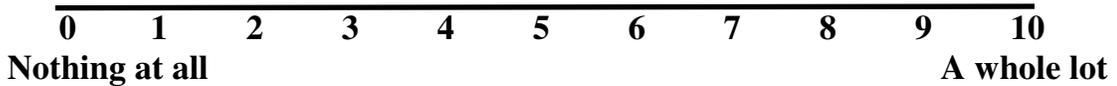
Despite what Ironmonger argues, zoos unfairly keep animals locked up in captivity. Captive animals become bored, cramped, and lonely. They are deprived of all control over their lives and are far from their natural homes. We don't need zoos to learn about animals. We have informative television programming, access to the Internet, and the ability to travel to other countries. Learning about or viewing animals in their natural habitats can be as simple as a flick of a switch. The idea of keeping animals confined is outdated.

After Reading
Section E: Knowledge Ratings

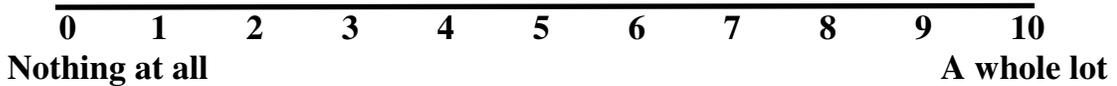
1. Place an **X** above the number on the line running from **nothing at all** to a **whole lot** to show what you know about how zoos take care of animals.



2. Place an **X** above the number on the line running from **nothing at all** to a **whole lot** to show what you now know about why people like zoos.



3. Place an **X** above the number on the line running from **nothing at all** to a **whole lot** to show what you now know about how zoos affect animals' lives.



After Reading
Section F: Belief Ratings

Instructions: Place an **X** above the number on the line running from **strongly disagree** to **strongly agree** to show how strongly you agree or disagree with these 4 statements **after** reading the article. Then, read the 3 reasons given below each rating and place an **X** next to the **ONE** that **best** supports your thinking **after** you've read the article.

1. "Animals should be kept in zoos to entertain and educate people."

0 1 2 3 4 5 6 7 8 9 10

Strongly Disagree **Strongly Agree**

_____ (1) I rated the above statement based mostly on the evidence presented in this article.

_____ (2) I rated the above statement based mostly on what I already know about zoos.

_____ (3) I rated the statement based mostly on what I believe or feel is true about zoos.

2. "Animals have a better life in zoos than in their natural environment."

0 1 2 3 4 5 6 7 8 9 10

Strongly Disagree **Strongly Agree**

_____ (1) I rated the above statement based mostly on the evidence presented in this article.

_____ (2) I rated the above statement based mostly on what I already know about zoos.

_____ (3) I rated the statement based mostly on what I believe or feel is true about zoos.

3. “Animals shouldn’t be kept in zoos because zoos are harmful to animals.”

0 1 2 3 4 5 6 7 8 9 10
Strongly Disagree Strongly Agree

____(1) I rated the above statement based mostly on the evidence presented in this article.

____(2) I rated the above statement based mostly on what I already know about zoos.

____(3) I rated the statement based mostly on what I believe or feel is true about zoos.

4. “We don’t need zoos to learn about wild animals when we have TV and the Internet.”

0 1 2 3 4 5 6 7 8 9 10
Strongly Disagree Strongly Agree

____(1) I rated the above statement based mostly on the evidence presented in this article.

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____(3) I rated the statement based mostly on what I believe or feel is true about zoos.

After Reading
Section G: Comprehension Questions

Instructions: Place an **X** on the line next to the **best** answer for each question.

1. Which statement below best represents the author's **main** purpose for writing this article?

_____ (1) to persuade the reader by presenting an argument for or against something

_____ (2) to inform the reader of something by presenting lots of facts

_____ (3) to provide an explanation of something by presenting lots of examples

_____ (4) to entertain the reader by sharing an interesting or thoughtful story

2. What is the author's **main** point in the article just read?

_____ (1) zoos and their treatment of animals

_____ (2) zoos do not treat animals fairly

_____ (3) frustrated zoo animals pace back and forth

_____ (4) experts disagree on keeping animals in zoos

_____ (5) well-run zoos help animals in many ways

3. Which statement represents a **detail** that the author used to support his main point?

_____ (1) zoos and their treatment of animals

_____ (2) zoos do not treat animals fairly

_____ (3) frustrated zoo animals pace back and forth

_____ (4) experts disagree on keeping animals in zoos

_____ (5) well-run zoos help animals in many ways

You are finished. Please close your task booklet. Thank-you for participating!

Reading Task Booklet 2SNR

Directions:

The prereading questions begin on the next page. Answer these questions before you read the article. Then, turn the page to the article about zoos and read it carefully. After reading the article, be sure to answer the questions in the order they appear. It's important that you not change any questions you've already answered before reading the article. Also, please do not look back at what you have already done or look ahead in the task booklet. When you've answered the last question, close your booklet on your desk.

revised April 4, 2007

Before Reading
Section A: Demographics

Instructions: Please answer the following questions so that I will be able to describe the students who have completed the reading tasks.

1. What sex are you? **(Circle one.)** Female or Male

2. What is your birth date? _____/_____/_____
Month / Day / Year

3. What is your race or ethnicity? **(Circle one or more.)**

African American

American Indian

Alaskan

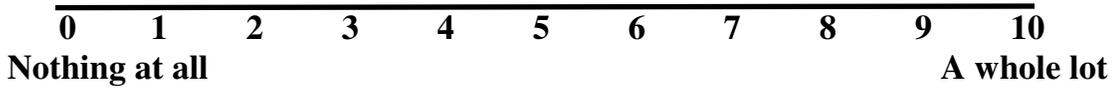
Asian

Hispanic or Latino

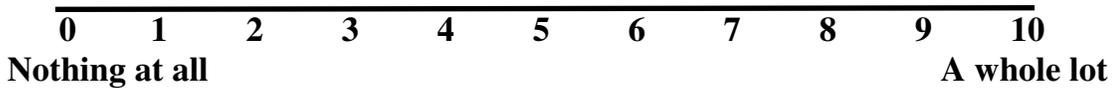
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Before Reading
Section B: Knowledge Ratings

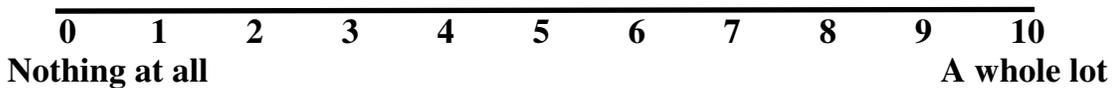
1. Place an **X** above the number on the line running from **nothing at all** to a **whole lot** to show what you know about how zoos take care of animals.



2. Place an **X** above the number on the line running from **nothing at all** to a **whole lot** to show what you know about why people like zoos.



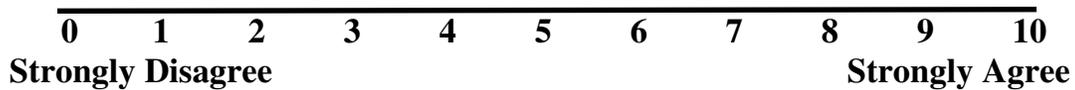
3. Place an **X** above the number on the line running from **nothing at all** to a **whole lot** to show what you know about how zoos affect animals' lives.



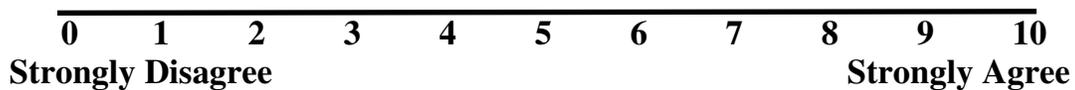
Before Reading
Section C: Belief Ratings

Instructions: Place an **X** above the number on the line running from **strongly disagree** to **strongly agree** to show how strongly you agree or disagree with each statement.

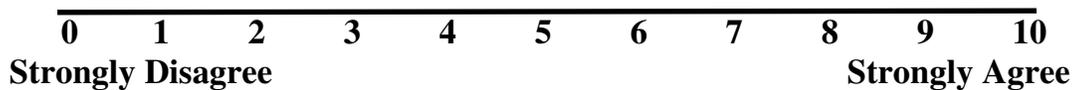
1. “Animals should be kept in zoos to entertain and educate people.”



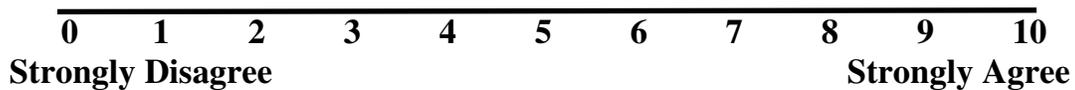
2. “Animals have a better life in zoos than in their natural environment.”



3. “Animals shouldn’t be kept in zoos because zoos are harmful to animals.”



4. “We don’t need zoos to learn about wild animals when we have TV and the Internet.”



During Reading Section D: Article Reading

Instructions: Please read the following article about zoos carefully. Complete the 4 ratings as you read by placing an **X** above the number on the line running from **not at all** to **a whole lot** to show how much your mind has changed. Then answer the questions that follow.

Are Zoos Cruel?

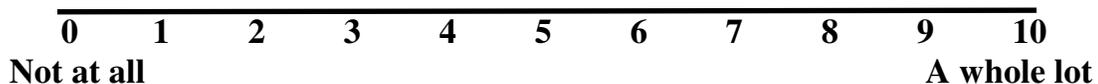
Zoos may seem to be safe places for wild animals, places where they are protected, cared for, and admired. Unfortunately, zoos also seem to hurt animals more than help them. Animal supporters and scientists disagree on whether or not zoos help or harm animals. John Ironmonger, author of *The Good Zoo Guide*, a guide that rates zoos in Great Britain based on their treatment of animals, supports good zoos because well-run zoos help animals. The People for the Ethical Treatment of Animals (PETA) believe that zoos unjustly keep animals in captivity, away from their natural homes, which ultimately harms animals.

John Ironmonger writes that most zoo keepers are genuine animal lovers who want animals to be ‘happy’. Most zoo keepers believe that animals in their charge are contented and as ‘happy’ as their wild relations. They believe, for example, that a wolf that sleeps all day in a zoo could be just as happy if not more content than a hungry wolf who must spend a majority of its time searching for food in the wild. Most zoo keepers want the animals they take care of to live ‘happy’ lives.

Ironmonger also argues that well-run zoos help animals live healthier lives. There is evidence that zoo animals tend to live longer lives, to feed better, and to suffer from fewer parasites or diseases than their wild relations. Zoo animals live without the fear of being hunted by other animals or humans, which they must guard against in the wild. Zoo animals also live without famine or food shortages because zoos provide the food necessary for a healthy existence.

Zoos also help animals by providing them with an environment that animals often prefer over their natural wild habitat. Zoologists have found that it is not always the case that animals are happiest in an environment that mimics their own wild habitat. For example, scimitar-horned oryxes normally have to find ways to survive in the semi-desert scrubland of the Sahara. But they do not necessarily choose or enjoy this harsh environment. On the contrary, they have been forced to live on the scrublands at the edge of their natural environment by other species who have out-competed them. Without a doubt, the scimitar-horned oryx appears to be in heaven among the green meadows of Marwell Zoo in southern England rather than the scrublands on which they've been forced to live. In this case, Marwell Zoo provides the scimitar-horned oryx with a better environment among green meadows than its wild counterparts who are forced to search for food among the scrublands.

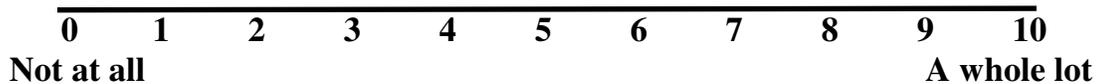
Place an **X** above the number on the line to show how much your mind has changed about zoos after reading this paragraph.



Other animals as well seem to prefer habitats other than their own natural habitat. For example, when we think of lions, we think of tropical, warmth-loving animals. However, zoos like Chester in the North of England offer their lions the option every winter day of centrally heated enclosures, or the cold winds of Cheshire. They almost always choose to put up with the cold temperatures, even preferring ice and snow to the warmth of their indoor home. These animals clearly favor environments that are not the same as their natural wild habitats. But the environments that some animals prefer can only be provided by zoos.

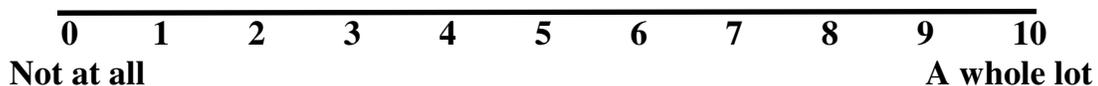
PETA has a different view pointing out that zoo animals suffer because their natural needs are rarely met. For example, birds' wings may be clipped so that they cannot fly. Aquatic zoo animals, like dolphins and whales, are often without enough water to move freely. Many aquatic and land animals who live in large herds or family groups in nature are kept alone or in pairs in zoos. Their natural hunting and mating behaviors have been replaced by regulated feeding and breeding schedules so that zoo animals cannot hunt and mate naturally. Because zoo animals are kept in small areas where their natural needs cannot be met, they often develop abnormal and self-destructive behaviors, or "zoochosis."

Place an **X** above the number on the line to show how much your mind has changed about zoos after reading this paragraph.



An Oxford University research team, who observed animals in captivity and in the wild for 40 years, seems to agree that animals suffer from being confined in small areas. They found that captive animals such as polar bears, lions, tigers, and cheetahs show the most signs of stress and/or mental and emotional trouble. They recommended either improving conditions for these animals or not keeping these types of wide-ranging carnivores in captivity. A PETA study of many zoos across the country found that several types of bears were showing disturbed behaviors. These frustrated animals spend much of their time pacing or walking in tight circles. Others sway or roll their heads, or show other signs of mental and emotional suffering. In some bear pens, paths worn by the bears' constant pacing can be seen. In others, there are actual paw impressions in the soil where bears have stepped in the same spot over and over again. Keeping animals in captivity appears to cause suffering in many wild animals.

Place an **X** above the number on the line to show how much your mind has changed about zoos after reading this paragraph.



After Reading
Section F: Belief Ratings

Instructions: Place an **X** above the number on the line running from **strongly disagree** to **strongly agree** to show how strongly you agree or disagree with these 4 statements **after** reading the article. Then, read the 3 reasons given below each rating and place an **X** next to the **ONE** that **best** supports your thinking **after** you've read the article.

1. "Animals should be kept in zoos to entertain and educate people."

0 1 2 3 4 5 6 7 8 9 10

Strongly Disagree **Strongly Agree**

_____ (1) I rated the above statement based mostly on the evidence presented in this article.

_____ (2) I rated the above statement based mostly on what I already know about zoos.

_____ (3) I rated the statement based mostly on what I believe or feel is true about zoos.

2. "Animals have a better life in zoos than in their natural environment."

0 1 2 3 4 5 6 7 8 9 10

Strongly Disagree **Strongly Agree**

_____ (1) I rated the above statement based mostly on the evidence presented in this article.

_____ (2) I rated the above statement based mostly on what I already know about zoos.

_____ (3) I rated the statement based mostly on what I believe or feel is true about zoos.

3. “Animals shouldn’t be kept in zoos because zoos are harmful to animals.”

0 1 2 3 4 5 6 7 8 9 10
Strongly Disagree **Strongly Agree**

_____ (1) I rated the above statement based mostly on the evidence presented in this article.

_____ (2) I rated the above statement based mostly on what I already know about zoos.

_____ (3) I rated the statement based mostly on what I believe or feel is true about zoos.

4. “We don’t need zoos to learn about wild animals when we have TV and the Internet.”

0 1 2 3 4 5 6 7 8 9 10
Strongly Disagree **Strongly Agree**

_____ (1) I rated the above statement based mostly on the evidence presented in this article.

_____ (2) I rated the above statement based mostly on what I already know about zoos.

_____ (3) I rated the statement based mostly on what I believe or feel is true about zoos.

After Reading
Section G: Comprehension Questions

Instructions: Place an **X** on the line next to the **best** answer for each question.

1. Which statement below best represents the author's **main** purpose for writing this article?

_____ (1) to persuade the reader by presenting an argument for or against something

_____ (2) to inform the reader of something by presenting lots of facts

_____ (3) to provide an explanation of something by presenting lots of examples

_____ (4) to entertain the reader by sharing an interesting or thoughtful story

2. What is the author's **main** point in the article just read?

_____ (1) zoos and their treatment of animals

_____ (2) zoos do not treat animals fairly

_____ (3) frustrated zoo animals pace back and forth

_____ (4) experts disagree on keeping animals in zoos

_____ (5) well-run zoos help animals in many ways

3. Which statement represents a detail that the author used to support his main point?

_____ (1) zoos and their treatment of animals

_____ (2) zoos do not treat animals fairly

_____ (3) frustrated zoo animals pace back and forth

_____ (4) experts disagree on keeping animals in zoos

_____ (5) well-run zoos help animals in many ways

You are finished. Please close your task booklet. Thank-you for participating!

Protocol Analysis

Reading Task Booklet 1S

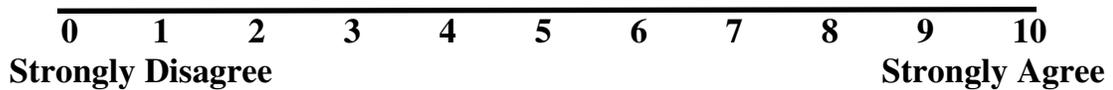
Directions:

The prereading questions begin on the next page. Answer these questions before you read the article. Then, turn the page to the article about zoos and read it carefully. After reading the article, be sure to answer the questions in the order they appear. It's important that you not change any questions you've already answered before reading the article. Also, please do not look back at what you have already done or look ahead in the task booklet. When you've answered the last question, close your booklet on your desk.

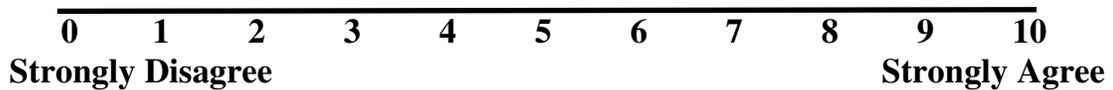
Before Reading
Section C: Belief Ratings

Instructions: Place an **X** above the number on the line running from **strongly disagree** to **strongly agree** to show how strongly you agree or disagree with each statement.

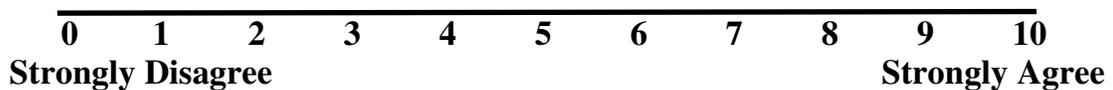
1. “Animals should be kept in zoos to entertain and educate people.”



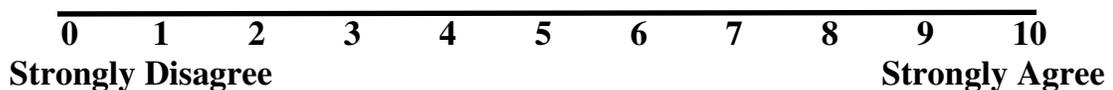
2. “Animals have a better life in zoos than in their natural environment.”



3. “Animals shouldn’t be kept in zoos because zoos are harmful to animals.”



4. “We don’t need zoos to learn about wild animals when we have TV and the Internet.”



During Reading
Section D: Article Reading

Instructions: Please read the following article about zoos carefully. Complete the 4 ratings as you read by placing an **X** above the number on the line running from **not at all** to **a whole lot** to show how much your mind has changed about zoos. Then answer the questions that follow.

Zoos Harm Animals

Zoos may seem to be safe places for wild animals, places where they are protected, cared for, and admired. Unfortunately, the sad truth about zoos is that they hurt animals more than help them. The People for the Ethical Treatment of Animals (PETA) believe that zoos unjustly keep animals in captivity, away from their natural homes, in small areas where their natural needs are not met. As a result, the animals become bored and lonely. Zoo animals are often ignored and abused so that people can be entertained.



Kept in cramped areas, zoo animals cannot move around freely. A dolphin in the ocean, for example, travels fifty miles a day. That's the same as five hundred laps around a typical marine zoo pool. According to animal supporter, Jeffrey Masson, dolphins and whales are animals that normally live in the entire ocean. To confine them in marine zoos where space is very limited is, basically, to put them in prison. Land animals, most of whom are used to running great distances, also suffer from being confined. Birds' wings may be clipped so that they cannot fly. Because captive animals cannot move around freely, they don't get the exercise they need.



Place an **X** above the number on the line to show how much your mind has changed about zoos after reading this paragraph.

0 **1** **2** **3** **4** **5** **6** **7** **8** **9** **10**

Not at all **A whole lot**

Even more important, zoo animals do not hunt for their food. Writer, Jared Diamond, summarizes how this affects animals' lives:

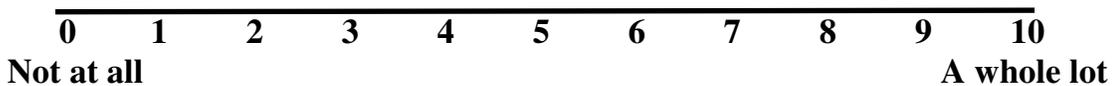
In the wild, animals spend most of their time on food: searching for it, capturing it, processing it, and eating it, often in many small amounts at many different places...In zoos, though, food traditionally consists of prepared chow that requires no capturing or processing, placed in a pan that requires no finding, and provided once a day. The animal gobbles down the chow in 5 minutes, leaving it 23 hours and 55 minutes a day to be bored.



Zoo animals also suffer from not being able to socialize with other animals. For example, zoos do not allow animals to mate naturally, controlling carefully how they breed. And many animals who live in large herds or family groups in nature are kept alone or, at most, in pairs. As a result, zoo animals cannot take part in normal, social activities.



Place an **X** above the number on the line to show how much your mind has changed about zoos after reading this paragraph. 😊



Because zoo animals cannot exercise, hunt for food, or socialize with other animals, they spend their time pacing back and forth and develop abnormal, self-destructive behaviors, or “zoochosis.” If you examine an animal in captivity, its restlessness and boredom are obvious. For example, captive gorillas often vomit and reswallow their food. They may also eat their feces, become abnormally aggressive, or groom themselves far more than any wild animal would.



An Oxford University research team, who observed animals in captivity and in the wild for 40 years, seems to agree that confinement hurts wild animals. They found that captive animals such as polar bears, lions, tigers, and cheetahs show the most signs of stress and/or mental and emotional trouble. They recommended improving conditions or not keeping these types of wide-ranging carnivores in captivity. A PETA (People for the Ethical Treatment of Animals) study of many zoos across the country found that several types of bears were showing disturbed behaviors. These frustrated animals spend much of their time pacing or walking in tight circles. Others sway or roll their heads, or show other signs of mental and emotional suffering. In some bear pens, paths worn by the bears' constant pacing can be seen. In others, there are actual paw impressions in the soil where bears have stepped in the same spot over and over again. These behaviors are not just signs of boredom. They indicate deep depression.



Zoo animals also suffer from being ignored by zoo keepers. When zoos must find ways to cut costs or add gimmicks that will attract visitors, animals are the ones who pay the price. Precious funds that should be used to provide more caring conditions for animals are often wasted on cosmetic improvements, such as landscaping or visitor centers, in order to draw visitors. Animals suffer from more than being ignored in some zoos. Rose-Tu, an elephant at the Oregon Zoo, suffered “176 gashes and cuts” caused by a zoo handler using a sharp metal rod. Another elephant, Sissy, was beaten with an ax handle at the El Paso Zoo. Zoo animals are often ignored and abused so that people can be entertained.

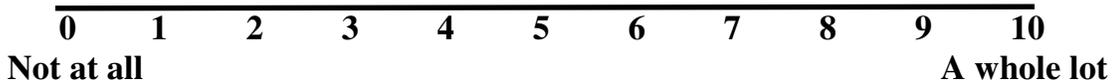


The animals on exhibit are not the only ones who suffer neglect and abuse by zoo keepers. Most zoos have an area that the public never gets to see. Here, rabbits, rats, mice, baby chicks, and other animals are raised and killed to provide food for the animals on display. According to one zoo volunteer, killing methods

include neck-breaking and “bonking.” Zookeepers place “feed” animals in plastic bags and slam their heads against a hard surface to induce fatal head injuries. Feed animals suffer abuse to keep zoo animals on display.



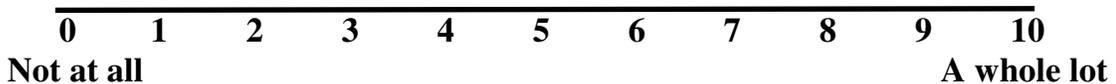
Place an **X** above the number on the line to show how much your mind has changed about zoos after reading this paragraph. 😊



When zoo babies get older and attract fewer visitors, they become unwanted by zoo keepers. Many are sold or killed by zoos. A chimpanzee named Edith is one example of a discarded zoo baby who fell into the wrong hands. Born in the 1960s at the Saint Louis Zoo, baby Edith was surely an adorable sight for visitors. But just after her third birthday, she was taken from her family and passed around to at least five different facilities. Finally, she landed at a Texan roadside zoo called the Amarillo Wildlife Refuge (AWR). During an undercover investigation of AWR, PETA found Edith in a filthy, barren concrete pit. She was hairless and had been living on rotten produce and dog food. When deer, tigers, lions, and other animals who breed frequently are no longer babies, they are sometimes sold to “game” farms where hunters pay for the “privilege” of killing them. Some are killed for their meat and/or hides. Other “extra” animals may be sold to circuses or smaller, more poorly run zoos where they may suffer further neglect and abuse.



Place an **X** above the number on the line to show how much your mind has changed about zoos after reading this paragraph. 😊



Zoos unfairly keep animals locked up in captivity. Captive animals become bored, cramped, and lonely. They are deprived of all control over their lives and are far from their natural homes. We don't need zoos to learn about animals. We have informative television programming, access to the Internet, and the ability to travel to other countries. Learning about or viewing animals in their natural habitats can be as simple as a flick of a switch or a hike up a mountain. The idea of keeping animals confined is outdated.



After Reading
Section F: Belief Ratings

Instructions: Place an **X** above the number on the line running from **strongly disagree** to **strongly agree** to show how strongly you agree or disagree with these 4 statements **after** reading the article. Then, read the 3 reasons given below each rating and place an **X** next to the **ONE** that **best** supports your thinking **after** you've read the article.

1. "Animals should be kept in zoos to entertain and educate people." 😊

0 1 2 3 4 5 6 7 8 9 10

Strongly Disagree **Strongly Agree**

_____ (1) I rated the above statement based mostly on the evidence presented in this article.

_____ (2) I rated the above statement based mostly on what I already know about zoos.

_____ (3) I rated the statement based mostly on what I believe or feel is true about zoos.

2. "Animals have a better life in zoos than in their natural environment." 😊

0 1 2 3 4 5 6 7 8 9 10

Strongly Disagree **Strongly Agree**

_____ (1) I rated the above statement based mostly on the evidence presented in this article.

_____ (2) I rated the above statement based mostly on what I already know about zoos.

_____ (3) I rated the statement based mostly on what I believe or feel is true about zoos.

3. “Animals shouldn’t be kept in zoos because zoos are harmful to animals.” 😊

0 1 2 3 4 5 6 7 8 9 10
Strongly Disagree **Strongly Agree**

_____ (1) I rated the above statement based mostly on the evidence presented in this article.

_____ (2) I rated the above statement based mostly on what I already know about zoos.

_____ (3) I rated the statement based mostly on what I believe or feel is true about zoos.

4. “We don’t need zoos to learn about wild animals when we have TV and the Internet.” 😊

0 1 2 3 4 5 6 7 8 9 10
Strongly Disagree **Strongly Agree**

_____ (1) I rated the above statement based mostly on the evidence presented in this article.

_____ (2) I rated the above statement based mostly on what I already know about zoos.

_____ (3) I rated the statement based mostly on what I believe or feel is true about zoos.

After Reading
Section G: Comprehension Questions

Instructions: Place an **X** on the line next to the **best** answer for each question.

1. Which statement below best represents the author's **main** purpose for writing this article?

_____ (1) to persuade the reader by presenting an argument for or against something

_____ (2) to inform the reader of something by presenting lots of facts

_____ (3) to provide an explanation of something by presenting lots of examples

_____ (4) to entertain the reader by sharing an interesting or thoughtful story



2. What is the author's **main** point in the article just read?

_____ (1) zoos and their treatment of animals

_____ (2) zoos do not treat animals fairly

_____ (3) frustrated zoo animals pace back and forth

_____ (4) experts disagree on keeping animals in zoos

_____ (5) well-run zoos help animals in many ways



3. Which statement represents a **detail** that the author used to support his main point?

_____ (1) zoos and their treatment of animals

_____ (2) zoos do not treat animals fairly

_____ (3) frustrated zoo animals pace back and forth

_____ (4) experts disagree on keeping animals in zoos

_____ (5) well-run zoos help animals in many ways



You are finished. Please close your task booklet. Thank-you for participating!

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