Schema and Scaffolding:

Testing Advance Organizers' Effect on Secondary Students' Reading Comprehension
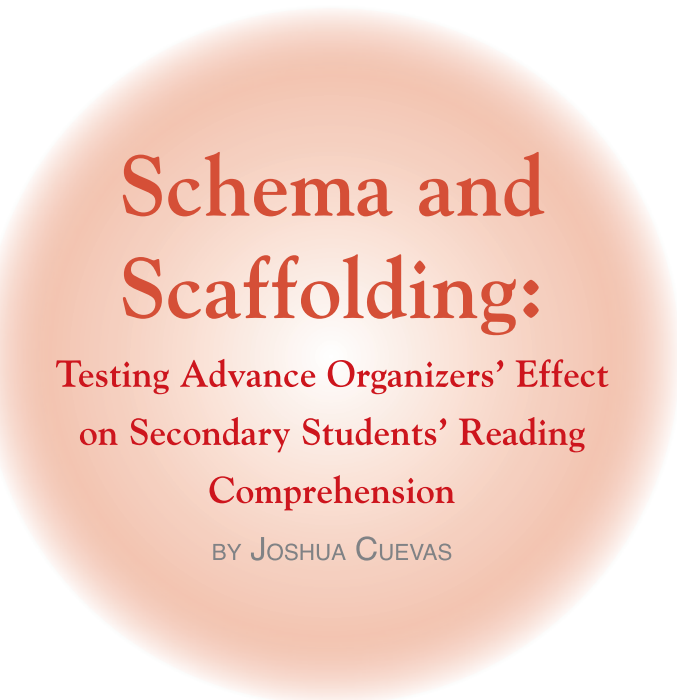
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Abstract

This study examined an instructional method that combined scaffolding and Schema Theory to address the reading comprehension of 105 urban high school students. Participants in the treatment condition read a pair of advance organizers and were asked to paraphrase them in writing to stimulate durable memory representation prior to reading the main passages. Students were assessed on their comprehension of both a narrative and an essay to measure treatment effects across text genres. Low level readers were expected to show greater benefits. Both high and low level readers from the treatment group benefited from the advance information on both passages. The results suggest that comprehension may be readily addressed via schema activation through advance organizers paired with cognitive strategies designed to assist with the encoding of information into long term memory.

Some experts in the field of literacy argue that there is no literacy crisis in the United States (Gee, 2008), but evidence points to stagnation and should at least be cause for serious concern. Ninety million adults are functionally literate at best, and those individuals comprise nearly half of the adults in the U.S. (Collins, 2006; Hock & Mellard, 2005). Sixty percent of the Americans who fall into this category are between 16 and 55 years old and make up a large portion of the nation's workforce. This trend has been noted by businesses, post-secondary institutions, and both national and international assessments, all of which have determined that recent high school graduates cannot sufficiently comprehend complex written information (Hasselbring & Goin, 2004). According to the United Nations Human Poverty Index, of all the countries in the Western world, the United States has the highest level of poverty and income inequality, and one of the primary determining factors of the Poverty Index is the percentage of adults lacking functional literacy skills (Feng, 2006). The state of literacy in the country and the implications of that condition seem clear and compelling: a great number of Americans today reach only marginal literacy levels and the lack of sufficient literacy skills can limit employment opportunities, leading to greater poverty.

Students are simply not acquiring the necessary reading skills before they leave high school, regardless of whether they drop out or graduate. One estimation is that 20% of all 17-year-olds in America are functionally illiterate and 44% of all high school students are only semi-literate (Hasselbring & Goin, 2004). Another is that by the 10th grade, only one third of U.S. students read proficiently, with nearly half of all 17-year-olds unable to read at the 9th grade level (Moss, 2005). And while the problem is widespread within regular education, poor literacy levels also fuel the increase in students relegated to special education classrooms, with 80% of the students placed there primarily because they have not learned how to read (Collins, 2006).

Statement of the Problem

The current literacy situation in the United States provides good reason to study literacy development in public school students. If students cannot read sufficiently, it clearly limits their capacity to learn academic material, if not to develop certain higher order intellectual skills. This, in turn, may limit their ability to function self-sufficiently and productively in modern society. Effective instructional methods and learning models must be developed to address these issues so that students are not limited in their potential due to a lack of reading skills.

The purpose of the current study was to extend prior research by employing scaffolding methods in an attempt to increase students' comprehension in high school language arts classrooms. It measured the effects of combining advance organizers with paraphrasing of the advance information in order to stimulate schema development. The advance organizers were meant to help create schemata, while the paraphrasing was meant to encourage the students to encode that information into long term memory so that it could be accessed during reading. The scaffolding strategy was assessed with both a narrative passage and an essay compilation to test for possible consistency across text genres.

For the purposes of this research, the following questions guided this study: The first question was

whether the scaffolding package would have any effect at all with the target population. The next was whether both high level and low level readers would show benefits from the intervention. Finally, there was the question of whether the scaffolding would benefit students on both the narrative passage and the essay compilation. The prediction was that the intervention would indeed assist students in comprehending the material but that the low level readers would benefit to a greater degree than the high level readers, who would show little, if any, advantage from the advance organizers. If the results lacked uniformity, the prediction was that students would benefit less on the narrative, since it was a structure they would be well acquainted with and would therefore need less assistance on, and benefit more on the essay compilation, which would be more abstract in structure.

REVIEW OF LITERATURE
Scaffolding
One common technique that can assist students in developing reading comprehension skill is the use of scaffolding (Vygotsky, 1986) or added layers of cognitive tools to assist in learning. Cognitive tools are defined by a number of functions: they are instruments that enhance cognition, guide cognitive processes, assist in accomplishing complex cognitive tasks, engage the learner, and facilitate critical thinking and higher-order learning (Liu & Bera, 2005). Combining learning strategies in an attempt to create layers of scaffolding has been shown to benefit high school students in their reading comprehension (Alfassi, 2004; Cromley & Azevedo, 2007). The question then becomes, which scaffolding layers and cognitive tools can be employed to assist students in comprehending material that would otherwise be beyond their abilities?

There is broad consensus that prior knowledge and background information are central to comprehension (Cromley & Azevedo, 2007; Guthrie, Wigfield, Metsala, & Cox, 1999; Snapp & Glover, 1990; Thompson, 1997; Thompson, 1998; Tracey & Morrow, 2006; Tyler, Delaney, & Kinnucan, 1983). Background information and prior knowledge are stored in memory in the form of schemata which must be accessed in order for fluid comprehension to take place. Scaffolding tools that can serve to encourage the formation and activation of schemata may be highly beneficial in addressing student literacy issues.

Schema Theory
Schema Theory suggests that knowledge is organized in the brain in sophisticated, interrelated structures, with all knowledge about a given topic being interconnected in a web-like fashion (Merriam, Caffarella, & Baumgartner, 2007; Tracey & Morrow, 2006). Without existing schemata in place, it is more

difficult to learn new material, as the level of abstraction is much greater. The learner has no previous framework on which to anchor the new concepts. In contrast, when students have comprehended text and learning has occurred, it suggests that they have successfully incorporated and attached the new concepts to some existing schemata (Kozminsky & Kozminsky, 2001). Levels of prior knowledge and background information, which function in the form of schemata, have repeatedly been shown to predict and correlate with increased text comprehension (Dinnel & Glover, 1985; Guthrie, et al. 1999; Kozminsky & Kozminsky, 2001; Snapp & Glover, 1990; Tracey & Morrow, 2006).

Advance Organizers
One form of scaffolding that directly influences schema production is the advance organizer. While there is no consensus on the exact structure and makeup of advance organizers, the generally accepted criteria are that they help to supply background knowledge and create schemata by providing a conceptual framework that allows the reader to anchor and organize information cognitively, which in turn makes the information more meaningful (Thompson, 1998). This is particularly important for poor readers who are slower and less efficient at encoding verbal information and who have difficulties in organizing information, filtering out irrelevant information, and isolating the most important elements (Thompson, 1998; Tyler et al., 1983). Advance organizers precede more extensive information and have been shown to be effective in assisting with comprehension in a number of studies at the middle school (Snapp & Glover, 1990) and college levels (Dinnel & Glover, 1985; Tyler et al., 1983).

Components
There is still some question as to what information should be present within an advance organizer to ensure its effectiveness. Since the information within an advance organizer is directly dependent on what information is within the text, there may be no singular answer to this question. However, there is strong support in the literature for a number of constructs which may be essential ingredients of an advance organizer.

Vocabulary is one component that provides obvious benefits and has repeatedly been shown to be strongly related to comprehension (Alfassi, 2004; Cromley & Azevedo, 2007; Leone, Krezmien, Mason, & Meisel, 2005; Ouellette, 2006). A great deal of research has supported the assertion that inferencing and prediction can be highly influential in reading comprehension and development (Alfassi, 2004; Cromley & Azevedo, 2007; Dewitz & Dewitz, 2003; Hock & Mellard, 2005; Klin, Murray, Levine, & Guzman, 1999; Kozminsky & Kozminsky, 2001; Lea, Mulligan, & Walton, 2005).

Likewise, there is also broad support for cognitive and metacognitive strategies such as generating questions, answering questions, summarizing, and paraphrasing (Alfassi, 2004; Cromley & Azevedo, 2007; Dewitz & Dewitz, 2003; Dunlosky & Lipko, 2007; Guthrie, et al., 1999; Hock & Mellard, 2005; Kozminsky & Kozminsky, 2001; Snapp & Glover, 1990). Through the process of self-questioning, paraphrasing, inferencing, and predicting, metacognition is activated; students begin to become aware of what they do and do not know and what they do and do not comprehend. Further, metacognition is believed to be an essential aspect of learning (Thiede, Anderson, & Therriault, 2003; Zabrucky, Agler, & Moore, 2008). All of these components- vocabulary, inferencing, predicting, questioning, and paraphrasing- can be addressed or encouraged with the use of advance organizers.

One caveat is that advance organizers must be learned to be effective, so the information must encode into memory to be accessible to students while they are reading the main passage (Dinnel & Glover, 1985). One method shown to assist subjects in encoding information and constructing a durable memory representation is requiring them to paraphrase that information before moving on to reading the main passage (Dinnel & Glover, 1985; Snapp & Glover, 1990; Thiede, et al., 2003).

To date, the vast majority of empirical research in reading comprehension, particularly with advance organizers, has been conducted on college level, middle school, or elementary subjects, with very few studies being conducted on high school students. High school students present a rather unique dynamic in comparison to the other populations. Their cognitive functions (Merriam, et al., 2007; Tennant, 2002) and reading comprehension levels (Cromley & Azevedo, 2007) resemble adults', but they are engaging in compulsory schooling. This is a very different situation than that of college students who attend school by choice and therefore would logically be more receptive to new material. The dearth of data on high school subjects and their distinctive place in the educational hierarchy speak to the need for research in the area.

METHOD
Participants
This study was conducted at a large urban Title I public high school of approximately 2,400 students located near Atlanta, Georgia. The majority of the students come from working class and lower middle class socioeconomic backgrounds, with 52% of the school's students qualifying for free or reduced meals. The school's graduation rate closely mirrors the state average for graduation. The racial demographics of the school are as follows: 70% African American, 24%

Caucasian, and 6% comprised of Hispanic, Asian, and Multiracial students.

One hundred and five students from four 10th grade American literature courses participated in the study. The students were between 15-17 years of age. The racial and socioeconomic makeup of the classes was the same as the overall school demographics. All classes in this study were officially from the college prep level. However, there are two subgroupings within the college prep category: regular college prep level and advanced college prep level. This study included four classes of students, two of which were at the regular college prep level and two at the advanced college prep level. Students with profound learning disabilities or English language learners were not included in the sample.

The school drew on a relatively large pool of 10th graders, approximately 700 students, and assigned them to various American literature courses within their program of study. The classes were randomly assigned to one condition or the other within the appropriate college prep level. Pretest data were used to test for possible nonequivalence between classes within each prep level.

Materials/Measures
Two reading passages were chosen for the experiment, both taken from the standard textbook for the course, the Holt Elements of Literature Fifth Course, Essentials of American Literature. The first selection was the short story, Dr. Heidegger's Experiment (Hawthorne, 2005). This passage was 3,686 words in length with a Flesch-Kincaid reading grade level of 9.4. The second selection was a compilation of excerpts from three essays, the bulk of which was drawn from Thoreau's Resistance to Civil Government, with shorter sections from Gandhi's On Nonviolent Resistance and King's Letter from a Birmingham City Jail (2005). These combined excerpts totaled 3,948 words in length with a Flesch-Kincaid reading grade level of 9.0.

Prior to reading each passage, all students received one of two possible forms of advance information relating to the text. The treatment groups read an advance organizer consisting of information meant to bolster vocabulary and stimulate schema formation, prediction, and inferencing. In contrast, the control groups read placebo preview information comprised mainly of biographical and historical information similar to the previews normally found in textbooks. The two placebo previews and two advance organizers can be found in Appendixes A through D. The placebo preview information was similar in length to the advance organizers and was meant to ensure that if the treatment groups outperformed the control

groups, it would not be due to the treatment groups simply reading more information.

The advance organizers contained a number of scaffolding devices designed to assist students in comprehending the passages. Key vocabulary words from the text were defined in simple terms. The structure of the passage was previewed for the readers. Situational information regarding the societal environment that influenced the writing of the text was provided to assist with schema development. Questions were asked of the readers to encourage them to focus on information that would be central to the meaning of the text.

Students who received the advance organizers were given a set of open-ended preview questions they were required to answer in writing. These questions asked the students to paraphrase, summarize, or define information from the advance organizer. The purpose of the preview questions was to stimulate metacognition and help students encode the information from the advance organizer into memory so that they could access it and retrieve it later as they read.

All students answered open-ended, open-book, short-answer adjunct questions as they read. These provided a measure of students' comprehension and served as the dependent variable for this study. The adjunct questions were sequentially ordered according to the text, with the answers to the first questions appearing at the beginning of the passages and the answers to the last ones at the end. Writing ability was not assessed. Often a single word or phrase would suffice as the correct answer. The adjunct questions for both passages focused mainly on knowledge and understanding but also included a number of questions requiring students to summarize, paraphrase, interpret, analyze and evaluate.

Procedures

Two interventions were administered to a total of 105 students approximately two weeks apart. There were four groups for each intervention: 1) college prep control group- students (N = 25) read the main passage and placebo advance information 2) college prep treatment group- students (N = 28) read the main passage and advance organizer requiring paraphrasing, 3) advanced control group- students (N = 22) read the main passage and placebo advance information, 4) advanced treatment group- students (N = 25) read the main passage and advance organizer requiring paraphrasing. All groups read the short story in a single class period on the same day, and then read the excerpts from the essays in a single period two weeks later. All groups responded to open book reading comprehension adjunct questions while they read the passages.

On the day of each intervention, upon entering class, all groups of students had approximately ten minutes to read the previews before beginning the main passages. No discussion or instruction regarding the literature was provided prior to the assignment. The treatment groups were asked to answer the open-ended preview questions while they were in possession of the advance organizers. Both the control groups and the treatment groups were required to turn in their respective preview information after they were done reviewing it, prior to beginning to read the main passages, so they were not able to examine the preview information as they read the main passages. After students had turned in the preview information, they opened their textbooks to the selection and began reading while simultaneously responding to the adjunct questions. Students had the entire 55-minute class period to complete their reading and the comprehension tests.

RESULTS
Scoring
Open-ended reading comprehension assessments served as the dependent variable for this study. Two raters, both doctoral students, were trained to rate the students' answers. The raters were blind in respect to the group membership of the participants. A third rater was used to assess only those items where there was a discrepancy between the two initial raters. The raters were provided with a detailed rubric encompassing a range of common answers they might see, both correct and incorrect. The raters scored on a three point scale with the possible values being full credit, half credit, or no credit. Full credit was awarded for any answer that addressed the question and could be considered a reasonable interpretation of the text. Half credit was given for attempts that were not reasonable interpretations but gave the indication that the student did read, if misunderstood, the text. No credit was given for blank answers or answers that were so implausible that they indicated the student did not read the text and simply offered a random response.

Interrater reliability was found to be relatively strong overall. For the first intervention, the test based on the story, interrater agreement was 0.93. For the second intervention, the test based on the excerpts from the essays, interrater agreement was 0.83. In the case of discrepancies, a third rater viewed the student's answer and scored the item. The score with plurality amongst the raters was determined to be the final score.

Analysis
Before conducting the main analysis, it was first necessary to test for equivalency between the classes

at each level. To test for differences in initial reading ability, all classes were assessed on three prior reading comprehension tests, and the mean scores were compared via two one-way ANOVA analyses. The preassessments were identical in format and similar in content to those used in the two interventions except that they did not include advance information of any sort. The ANOVAs did not reveal a significant difference between either the college prep classes, $F(1, 53) = .59$, $p = .45$, partial $\eta^2 = .01$, or the advanced classes, $F(1, 47) = 2.64$, $p = .11$, partial $\eta^2 = .05$.

Next a 2 x 2 ANOVA (level x treatment) was conducted for each intervention to measure for differences on the dependent variable. "Level" was defined by whether students were enrolled in the regular college prep level or advanced level program of study. "Treatment" was defined by whether students were in the control group that received the placebo advance information or in the treatment group that received the true advance organizer paired with the preview questions. Students' scores on the adjunct reading comprehension questions served as the dependent variable.

For the first intervention, the passage Dr. Heidegger's Experiment (Hawthorne, 2005), a significant main effect was found for level, $F(1, 96) = 11.52$, $p = .001$, partial $\eta^2 = .11$. The advanced level classes significantly outperformed the college prep level classes, as expected. A significant main effect also emerged for treatment, $F(1, 96) = 4.87$, $p = .03$, partial $\eta^2 = .05$. At both the college prep and the advanced level, the students who received the true advance organizer with preview questions significantly outperformed the students who received the placebo advance information. However, no significant interaction effect was revealed, $F(1, 96) = .001$, $p = .98$. This suggests that while students at both the college prep and advanced level appeared to have benefited from the treatment package, both low level readers and high level readers benefited from it to a similar degree. This was somewhat of a surprise in that low level readers were expected to benefit more from the treatment and high level readers were expected to show little,

if any, benefit. Means and standard deviations for this intervention can be found in Table 1.

For the second intervention, on the excerpts from the essays of Thoreau, Gandhi, and King, another 2 x 2 ANOVA (level x treatment) analysis was conducted. A significant main effect was again found for level, $F(1, 95) = 9.95$, $p = .002$, partial $\eta^2 = .10$, with the advanced level students outperforming the college prep level students. Importantly, a highly significant main effect was revealed for treatment $F(1, 95) = 12.23$, $p = .001$, partial $\eta^2 = .11$. Just as in the first intervention, students at both program levels who received the advance organizer with preview questions outperformed their peers in the control groups who received only the placebo information. And once again, no significant interaction effect emerged for this portion of the experiment, $F(1, 95) = 1.35$, $p = .25$. In findings similar to the first intervention, both the low level readers and the high level readers appeared to have benefited from the treatment to a similar degree and showed superior comprehension to those in the control groups. Means and standard deviations for this intervention can be found in Table 2.

Discussion

The results of this experiment were most surprising in their uniformity. It had been predicted that the use of the advance organizers with the preview questions would stimulate enhanced comprehension to some extent, predominantly in lower level readers, as previous research has indicated (Thompson, 1997; Thompson, 1998; Tyler et al., 1983). Scaffolding was thought to assist lower level readers in closing the gap in background knowledge that exists between low level and high level readers (Kozminsky & Kozminsky, 2001).There was also some question as to whether students would benefit from the treatment on both narrative passages and essays. The findings showed a clear difference in reading comprehension between students in the treatment groups and control groups. Not only did students from the treatment groups outperform those in the control groups on both the narrative passage and the compilation of essays, but both the college prep level and advanced level students showed superior comprehension to their counterparts in the control groups on each intervention. Essentially, both low level and high level readers appeared to benefit from the treatment package regardless of the reading material.

These findings suggest that the advance organizers were successful in constructing an episodic memory structure that

Table 1 Measures of Central Tendency for Dr. Heidegger's Experiment

Level	Treatment	Mean	Std. Deviation	N
Advanced	Advance Org	94.60	6.60	25
	Control	89.55	11.12	22
	Total	92.23	9.26	47
College Prep	Advance Org	86.79	11.72	28
	Control	81.60	15.12	25
	Total	84.34	13.55	53
Total	Advance Org	90.47	10.34	53
	Control	85.32	13.85	47
	Total	88.05	12.33	100

could be interpreted as being the germination of schemata. They appear to have been successful in assisting students to comprehend the subsequent reading material. By having the students paraphrase the information in the advance organizers, it may have helped the students to encode that information into memory so that they could make use of it later when they read the passages. It is likely that if the students had not been asked to paraphrase the advance information they would have either skimmed over it in a superficial manner or skipped it altogether. Under either of these scenarios the material would not have been devoted to memory, and therefore the advance organizer would have had no effect.

Considering that the cognitive load necessary to comprehend an essay may vary greatly from the load necessary to comprehend narrative text, it is notable that the results indicated similar findings on both the narrative and compilation of essays. Recall that both passages were similar in length and in difficulty, as determined by the Flesch-Kincaid reading grade level: 9.4 for the narrative and 9.0 for the compilation of essays. However, it must be noted that the Flesch-Kincaid Grade Level indicator is determined by a calculation based on word length and sentence length and does not account for background schemata necessary to comprehend the material or for the genre. Essays may be more difficult for students to comprehend than narratives due in large part to their greater level of abstraction.

For instance, with a narrative students can visualize the setting and characters. Students are also acclimated to the chronological and literary structure of a story from a very early age. The fact that students are so accustomed to this structure may serve to mitigate difficulties that arise from increased word length and sentence length, the two features that determine the Flesch-Kincaid Grade Level. When reading a narrative, the readers' cognitive faculties may be freed to concentrate on more subtle and intricate aspects of a story because the structural pattern is so familiar to them. In contrast, essays vary greatly in their presentation of ideas and are far more abstract. As the readers attempt to navigate new vocabulary, sentence length, and concepts, they must also grapple with a structure that may be unfamiliar to them since the way essays unfold varies widely from author to author. This may cause an increased cognitive load as these sometimes competing hurdles are navigated. Because the readers must divide their attention between interpreting new vocabulary, retaining prior information provided by the author, and attempting to discern the context and direction of the passage simultaneously, an essay with a reading grade level that is equivalent to that of a narrative may in actuality be much more difficult to comprehend.

The abstract philosophical nature of these essays paired with the sophisticated themes of social justice tend to be difficult for students to grasp and somewhat removed from their daily concerns. Given the probable discrepancy in the cognitive demands of the narrative and essay compilation in this research, it is significant that the advance organizers appeared to have similar effects with both types of passage. This would suggest that the treatment had a powerful influence that can transcend literary genres.

Overall, both interventions appeared to be successful in promoting enhanced reading comprehension in both low level and high level readers and with both narrative and essay formats, so this type of treatment has the potential to have a substantial impact on reading education. However, it is important to note that the benefits of advance organizers are dependent on how well they pair with the main passage. If the material does not pair well conceptually with the reading material, it is unlikely that students will benefit. Many textbooks include preview information that publishers may argue would qualify as advance organizers. But more often, that preview information resembles the placebo information that the control groups in this study read, with a heavy reliance on biographical information and abstract literary terms. In addition, in textbooks there is usually no mechanism in place to encourage the students to read the advance material closely and encode it into memory.

A successful advance organizer should stimulate the formation of new schemata or trigger existing schemata that pertains directly to the conceptual framework of the passage. This would include explaining key terms used within the passage, as opposed to limiting the vocabulary definitions to

Table 2 Measures of Central Tendency for essays of Thoreau, Gandhi, and King

Level	Treatment	Mean	Std. Deviation	N
Advanced	Advance Org	82.19	11.34	27
	Control	70.74	13.36	23
	Total	76.92	13.48	50
College Prep	Advance Org	71.58	12.87	24
	Control	65.84	11.31	25
	Total	68.65	12.31	49
Total	Advance Org	77.20	13.10	51
	Control	68.19	12.45	48
	Total	72.82	13.50	99

more abstract literary terms. Background and historical information can also be helpful, but only if it helps the reader to anchor the specifics of the text to some thematic context in a relatively concrete way. Posing questions to readers and asking them to summarize or paraphrase relevant information may not only assist in encoding but also encourage metacognition and metacomprehension, thus stimulating higher order cognition and increasing learning. Treatments of this sort could be incorporated into standard curricula and possibly help produce widespread gains in student reading comprehension.

Future Research

Because reading studies on high school students are so rare relative to studies on younger children and college students, there is ample opportunity for more research in the area. Future research should extend the clear and uniform results of this study by testing advance organizers with a wider variety of literature. Subsequent research could explore whether advance organizers work effectively with other genres such as technical documents, informational texts, media sources, etc. Once effective pairings of advance organizers and main passages can be identified, they can be incorporated into curricula and textbooks. Since there is some measure of standardization in the reading selections in public school textbooks, advance organizers that are found to be successful in improving comprehension could find extensive use.

Possibly the most important avenue of research would be to test the long term effects of this type of scaffolding on global reading comprehension. While it appears that advance organizers can affect reading comprehension on passages read immediately following the information, it is less clear what the effects would be over time. For instance, if students were supplied with advance organizers throughout the course of a full year and were able to improve their performance on each individual assignment, would their overall skills develop and would those skills generalize to other reading assignments? Would their reading grade level improve significantly more than students who read the same material without the help of scaffolding? Would the students who used the advance organizers be able to comprehend more sophisticated material later without the having the benefit of the advance organizers on subsequent assignments? These types of questions may be answered with more extensive longitudinal studies.

In order for educators to positively affect reading comprehension levels in adolescents and young adults, which is clearly a vital educational outcome, other successful scaffolding techniques and materials must be identified and find regular use within the classroom. This research is small step in that direction. For many students, high school is the last time in their lives that they will experience formal, systematic assistance in reading skills. For this reason, we must identify methods that can be successful in improving the literacy skills that will be essential to so many students in their adult lives, yet so many still lack during their last years of formal education.

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Appendix A

Advance Organizer: Dr. Heidegger's Experiment

Vocabulary:
• venerable- old and well respected
• supernatural- magical, mystical
• rejuvenate- to make grow again, bring back to life
• virtue- good quality, goodness, righteousness
• vice- bad human quality or trait

Information:
The story is a dark, mysterious tale about a scientist, Dr. Heidegger, who conducts an experiment to see if he can bring four deceased friends back to life and make them young again.

These are the four friends:
• Mr. Melbourne, a greedy businessman
• Colonel Killigrew, a partier who liked to drink and chase women
• Mr. Gasciogne, a dishonest politician
• Widow Wycherly, an attractive, stuck up woman with a bad reputation regarding men

Widow Wycherly had dated all three men when they were younger (and alive), and the men had fought over her.

Dr. Heidegger conducted his experiment in his laboratory, which was filled with mysterious, spooky, and supernatural objects.

Fifty years earlier something had happened to Dr Heidegger's fiancé, Sylvia Ward, right before they were to be married.

In order for Dr. Heidegger to convince his friends to take part in the experiment, he first had to demonstrate that his potion worked on another object that had once been alive.

Before his friends drank the liquid, Dr. Heidegger tried to make them agree to certain conditions (general rules) that they would be expected to follow if the potion worked.

The potion will have an effect on both the guests' behavior and appearance once they drink it.

The story is an allegory, which means that the characters and events represent moral qualities or ideals. They are meant to send a message about the human condition.

The theme of the story relates to what each guest represents and how they behave. Think about what Dr. Heidegger learns about people from his experiment. What is he actually testing?

Dr. Heidegger's Experiment Preview Questions
1) What does supernatural mean?
2) What does rejuvenate mean?
3) Describe Mr. Melbourne:
4) Describe Colonel Killigrew:
5) Describe Mr. Gasciogne:
6) Describe Widow Wycherly:
7) What did the three men have in common?
8) Who was Sylvia Ward?
9) What did Dr. Heidegger want his guests to agree to?

Appendix B
Placebo Information: Dr. Heidegger's Experiment

Nathaniel Hawthorne lived from 1804 to 1864 and was a major writer of the American Romantic period. He was descended from Puritan ancestors. One of his ancestors was John Hawthorne, a judge who played a minor role in sentencing nineteen people to death in Salem, Massachusetts during the Salem witch trials.

Nathaniel Hawthorne's writing often reflected the dark suspicions of the early Puritans, and he was considered one of the "Dark Romantic" writers, alongside of Edgar Allen Poe. Hawthorne's writing dealt with matters of religion, guilt, spirituality, hypocrisy, conscience, secret sin, and questions of the human soul. The gloom that made its way into Hawthorne's writing also seemed to cast a shadow over his life, as he lived a melancholy, solitary existence that left him detached and disappointed. It was said he died because he could no longer endure his own solitude.

Hawthorne wrote two very famous novels, The Scarlet Letter and The House of Seven Gables, as well as the short stories "The Minister's Black Veil" and "Dr. Heidegger's Experiment". "Dr. Heidegger's Experiment" was written by Hawthorne in 1837. It was first published in a book titled Twice-Told Tales as part of a collection of short stories. The story is a dark, mysterious tale that serves as an allegory, which means the characters, settings, and events stand for abstract ideas or moral qualities. In the story, Dr. Heidegger is visited in his study, or laboratory, by four friends, Mr. Melbourne, Colonel Killigrew, Mr. Gasciogne, and Widow Wycherly. He then conducts an experiment with their help.

Appendix C
Advance Organizer: Thoreau, Gandhi, MLK Jr.

• Civil- 1) having to do with citizens or government, 2) polite, courteous, civilized
• Disobedience- resistance, defiance, refusal to obey
• Expedient- convenient, to do something because it's easy
• Conscience- a person's sense of right and wrong
• Morality- a person's set of rules for right and wrong
• Satyagraha- to be uncooperative, refusal to cooperate

The following piece, titled Resistance to Civil Government and better known as Civil Disobedience, is an essay with a story inside. It is an essay because its purpose is to convince the reader of the author's opinion, but a short story is used within it to help communicate the author's message.

The purpose of the essay was to examine both the morality of the individual person and the morality of the government.
• What should a person do if what he or she thinks is right is different than what the government thinks is right?
• What should the person do if the government tries to make them go along with something he or she knows is wrong?
• Should a person do what their conscience tells them or what the government tells them?
These are the questions that the author, Henry David Thoreau, tries to answer.
Thoreau did not agree with the war the U.S. was waging against Mexico at the time because he thought the government was being used as a tool for a small group of people to expand slave territory for their

own monetary and political gain. He didn't think the American people would have agreed to go to war with Mexico if they had known the truth from the beginning. He also believed that people who didn't agree with the war actually still supported it by supporting the government by paying taxes, which went to buy guns and to pay soldiers to fight.

Thoreau also felt that there was a problem with the way the majority always got its wish in our country. As you read, think about why this could be a bad thing in some circumstances.

The story within the essay has to do with what happened to Thoreau when he refused to pay his taxes. He wouldn't pay his taxes because he didn't want to support a government that was conducting an unjust war. He was sent to jail for not paying and the story is about the time he spent in prison and how it changed his views of America.

Mohandas Gandhi and Martin Luther King Jr. read Thoreau's essay and were highly influenced by it. They developed beliefs about civil disobedience that were similar to Thoreau's.
• As you read each man's ideas, think about what they had in common. What are the things they would all agree upon?

Thoreau, Gandhi, MLK Jr. Preview Questions
1) What are two different meanings of the word "civil"?
2) What does Satyagraha mean?
3) Is the piece of literature Resistance to Civil Government as essay or a story?
4) List one question Thoreau tried to answer by writing Resistance to Civil Government.
5) What was something about the U.S. that Thoreau disagreed with or had a problem with?
6) Why was Thoreau put in jail?
7) Who were two famous men who were influenced by Thoreau's essay?

Appendix D
Placebo Information: Thoreau, Gandhi, MLK Jr.

Henry David Thoreau was born in Concord, Massachusetts in 1817. He grew up fishing and hunting in the woods near his home. He later went to Harvard where he never ranked above the middle of his class, but became extremely well read and knowledgeable of English literature and German philosophers. Thoreau was always a bit eccentric (strange), independent, and driven by conscience. For instance, he always dressed in green to go to church simply because the rules required churchgoers to wear black. He was fired from his job as a teacher because he refused to whip children, which was the traditional and mandatory punishment in schools at the time.

His Harvard education did not ensure Thoreau success. He was not successful as a school teacher, lectures he gave were not inspiring, and he was turned down by a woman he proposed marriage to. Even though he was highly intelligent and a gifted writer, he seemed to only want to stay around his hometown and live a simple life. Many of those around him viewed him as a slacker who lacked ambition. However, today he may be seen as the first hippy, someone who refused to be a part of normal, everyday society and instead chose to live a life determined by his own standards. Thoreau was not motivated by fame or wealth, and chose to live a solitary life contemplating the ideal society and the right way to live.

Thoreau was a friend of Ralph Waldo Emerson, who wrote Nature and Self-Reliance. Since Emerson was older, he became something of a mentor and teacher to Thoreau. But while Emerson lived a relatively affluent lifestyle and wrote his poetry and philosophy in comfort of his nice home, Thoreau tried to live the way his philosophy led him to- poor, alone, in a small house in the woods he built himself from scratch. Thoreau was a strong opponent of slavery and the war that the U.S. was waging against Mexico. He refused to pay his taxes because he thought that by doing so, he would be supporting slavery and the Mexican war. He was jailed for not paying his taxes and wrote the essay Resistance to Civil Government in response to his experience there.

Two very famous men, Mohandas Gandhi and Martin Luther King Jr. read Thoreau's essay Resistance to Civil Government and were highly influenced to use his ideas in their own lives. Gandhi developed a philosophy similar to Thoreau's when he was helping his fellow citizens in India to gain independence from England. Martin Luther King Jr. used a philosophy similar to Thoreau's when he protested for racial equality in the U.S. and led the civil rights movement.