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ABSTRACT

To examine the effects of students reading multiple documents on their perceptions of a historical event, in this case the "discovery" of America by Christopher Columbus, 85 high school freshmen read 3 of 4 different texts (or sets of texts) dealing with Columbus. One text was an encyclopedia article, one a set of articles from "Newsweek" and "Time," one an anti-Columbus diatribe, and one a counter-revisionist article from a prominent historian. Results indicated that students' attitudes towards Columbus changed initially after the first reading and tended to remain stable after that. Students' attitudes towards Native Americans were unaffected by the text reading, but tended to be generally positive and remained so. Second, a refutational text (the "Newsweek" and "Time" articles) had the greatest impact on students' attitudes toward Columbus, and a text with an outright negative tone had the least impact. Third, students' misconceptions about Columbus tended to change slowly after each text reading in contrast to their attitudes, which changed after a single reading. (Contains 20 references, and 1 table and 2 figures of data.) (Author/RS)

In Fourteen Hundred and Ninety-Two, Columbus Sailed the Ocean Blue: The Effects of Multiple Document Readings on Student Attitudes and Misconceptions

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The National Reading Research Center (NRRC) is funded by the Office of Educational Research and Improvement of the U.S. Department of Education to conduct research on reading and reading instruction. The NRRC is operated by a consortium of the University of Georgia and the University of Maryland College Park in collaboration with researchers at several institutions nationwide.

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"In Fourteen Hundred and Ninety Two, Columbus Sailed the Ocean Blue": Effects of Multiple Document Readings on Student Attitudes and Misconceptions

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Abstract. *In order to examine the effects of students reading multiple documents on their perception of a historical event, in this case the "discovery" of America by Christopher Columbus, 85 high school freshmen read three of four different texts (or sets of texts) dealing with Columbus. One text was an encyclopedia article, one a set of articles from* Newsweek *and* Time, *one an anti-Columbus diatribe, and one a counter-revisionist article from a prominent historian. Results indicate that students' attitudes toward Columbus changed initially after the first reading and tended to remain stable after that. Students' attitudes toward Native Americans were unaffected by the text reading, but tended to be generally positive and remained so. Second, a refutational text (the* Newsweek *and* Time *articles) had the greatest impact on students' attitudes toward Columbus, and a text with an outright negative tone had the least impact. Third, students' misconceptions about Columbus tended to change slowly after each text reading in contrast to their attitudes, which changed after a single reading.*

Perhaps nowhere else in the teaching of history are the weaknesses of a single text approach to history more evident than in students' knowledge of and attitudes toward Christopher Columbus. Columbus is viewed as the hero of the Age of Exploration among elementary school students for his discovery of a New World, as reflected in the rhyme that forms part of the title of this paper. This view of Columbus as hero does not dissipate as a student goes through high school and learns more about history. Indeed, the idea of Columbus as a benign dreamer who, against all odds, sailed off into unknown territory and found a New World dominates the thinking of many high school students.

Columbus is a more complex character, however, and the controversy around Columbus's voyages and their effects can serve as a microcosm of the issues surrounding critical analysis of historical events. First, the term

discovery represents a Eurocentric view of the world. Certainly the Americas were discovered by the Native American peoples whose ancestors came over a land bridge from Asia and who were living there when Columbus arrived. These peoples had complex civilizations prior to the coming of the Europeans. Second, the accounts of Columbus as benign dreamer disregard his subsequent actions as a ruthless administrator who supervised the slaughter of Native Americans as he attempted to establish a beachhead for Spain in the Americas. Third, the diseases brought by the Europeans killed off entire peoples, such as the Taino (Bigelow, 1992; Sale, 1992).

These critical views of Columbus have been countered by Schlesinger (1992), who suggests that the Native Americans were not as benign as the critics of Columbus portray them, nor was Columbus especially ruthless in the context of his time. Placing these views side by side would give a student a richer view of Columbus.

Once we would have been content if our students learned the facts about Columbus. But our view of content area reading is becoming broader as educators adopt broader goals for learning from text. As FitzGerald (1979) and others point out, conventional history texts tend to distort history by presenting a single view. This single view tends to be conventionalized, to represent a dominant view, rather than to provide the student with a rich conception of an event and its effects. Furthermore, conventional textbooks tend to be difficult to understand because they are set up as a conveyance of isolated facts (Beck, McKeown, & Gromell, 1989). To make a complete representation of a historical event, students require a great deal of prior knowledge and the ability to make inferences. Such complete understanding involves viewing the same incident from different perspectives (Spiro, Coulson, Feltovich, & Anderson, 1994) rather than from the single, omniscient perspective of the textbook.

Educators are moving beyond a concern with learning information from single texts to a concern with developing both rich content and disciplinary knowledge, from memorizing what historians and scientists have discovered to thinking like historians and scientists. Developing such knowledge involves texts, but involves using those texts in a different way than the traditional read-and-study-for-a-test approach.

Reading to Learn More than Facts

Teaching children to read in order to learn information in the content areas has moved beyond a concern with learning facts, to a concern with using texts to develop both a richly interconnected base of content knowledge, and disciplinary knowledge, or learning how to think like a practitioner of a discipline. Learning from content materials is important as a prerequisite to intelligent participation in democratic traditions. Hirsch (1987) argues that a "cultural literacy" binds a people together by preserving a common vocabulary. In the United States, Hirsch argues a shared knowledge of English literature, of cultural figures ranging from Louis Armstrong to Leonardo, of basic science, and so forth, allows us to communicate with each other as one people. Others argue that the critical facilities developed

through schooling are necessary for people to participate in a democracy, because such intelligent participation involves critical evaluation of alternatives in relation to the person's prior experience, knowledge, and beliefs (Botstein, 1991).

To participate in a democratic society requires more than a set of facts, or even an integrated knowledge base; it also requires the ability to reason within that knowledge base. Botstein (1991), a social scientist, argues for the importance of critical analysis of current events, for learning to "think like a historian" so that one can understand history as it unfolds. From this perspective, the basic skills needed to participate in a democracy involve not only basic reading comprehension, but also critical analysis of information. To evaluate competing political platforms requires the same evidentiary skills that a historian needs to evaluate historical facts. Given the enlargement of the franchise in twentieth-century America, from only white male landholders to all Americans, the need for critical literacy is greater than it was in colonial days. Although we have been relatively successful in developing children's ability to learn facts, we have been less successful in teaching children to reason with those facts. For example, in the 1990 NAEP Report (Foertsch, 1992), a majority of twelfth graders (68%) constructed vague answers or offered inadequate support for their answers on a task involving understanding of a historical event.

Traditionally, intermediate and secondary teachers have tended to treat content area knowledge like Hirsch (1987), as a "basket of facts" that must be gathered from text and lecture. Indeed, one high school history teacher quoted by Wineburg (1991b) put it as follows: "History is the basic facts of what happened. What *did* happen. You don't ask how it happened. You just ask, 'What are the events?'" (p. 513). But schema theorists such as Anderson and Pearson (1984) have pointed out that one does not learn facts in isolation. Instead, facts are connected to each other and to broader generalizations. Schema theory posits that a person's knowledge will affect the way that new information is comprehended and recalled (Anderson & Pearson, 1984). Schema theory views the reader as actively constructing new knowledge from information received from texts and information that the reader had before reading the text.

Preconceptions

Schema theory implies that students will construct interpretations of newly learned material by assimilating and accommodating already existing schemas (Rumelhart, 1981). If the schemas are consonant with the new information, then learning is easy. If the schemas do not agree with the new information, then the student must accommodate the new information into the existing schema through changing the schema. This is difficult, and often students reject either the old information or the new information. Thus, preconceptions may have a strong influence on student learning. This has been studied most often in science learning.

Students appear to learn new information that is counter to their preconceptions when they are encouraged to examine the difference

between prior notions and new information, and when they are helped to make bridges between common experiences and more complex ones (Brown & Clement, 1987). Without the activation of prior knowledge, it is improbable that long-term learning will take place. Students may memorize and compartmentalize new information for the purpose of passing a test, for example, but forget the information when the test is over. Since this information does not fit into their preexisting knowledge base, it tends to be forgotten. Therefore, activation of a student's preconceptions is critical to learning.

When students' intuitive ideas contradict current scientific thinking, the text can refute a students' preconceptions. Such text might have the structure of "Many people think that _____, but actually ....", in which the text actively attempts to confront common non-scientific ideas. Guzzetti, Snyder, Glass, & Gamas' (1993) meta-analysis of studies of science misconceptions revealed that refutational text, text that presents common alternative frameworks for concepts and refutes them, was more effective than all other types of texts across grade levels in producing learning of counterintuitive science concepts as measured by tests of knowledge and application. A likely explanation is that refutational texts tie new knowledge to students' preconceptions. In the case of a refutational text about projectile motion, for instance, it was found that many students' preconceptions resembled the pre-Newtonian impetus theory described in that text (Hynd, Qian, Ridgeway, & Pickle, 1991). Perhaps students, in reading this description, recognize their own ideas. Finally, refutational text may be effective because it presents elaborations and explanations that make the new concept appear understandable, plausible, and useful.

To develop content knowledge, according to this perspective, one needs to take into account both the prior knowledge and predispositions held by the student and the nature and organization of the text itself. But learning the content, while important, is not enough. In addition, students need to use the content to reason critically about the content. Stahl, Hynd, Glynn, and Carr (1996) call this ability "disciplinary knowledge," which involves the knowledge about the discipline—history, science, and so on—that a person practicing the discipline—historian, scientist, and so on—might have. For instance, this means being able to approach history like a historian, weighing evidence and drawing conclusions.

Disciplinary Knowledge in History

Students need the development not only of content knowledge, but also of the critical abilities and the disposition to use these abilities. For example, the skills used by historians to evaluate historical evidence are, in our opinion, similar to the skills needed to evaluate history as it unfolds in current events.

Wineburg (1991a, b) gave eight historians and eight high school seniors a series of historical texts about the Battle of Lexington and had them do a variety of activities, including thinking-aloud about their reading, rating the trustworthiness of the documents, and evaluating the historical veracity of three paintings of the Battle. Wineburg noted that historians could be

distinguished from the students by their use of three processes: corroboration, or comparing documents with one another; sourcing, or looking first at the source of the document before reading the text itself; and contextualization, or situating a text in a temporal and spatial context. These differences were not simply due to differences in knowledge, because historians who did not know very much about the American Revolution still used the same reasoning processes in their think-alouds. Nor are the differences due to inability to detect bias. Both the college students in Perfetti, Britt, Rouet, Mason, and Georgi's (1993) study and the high school honors students in Stahl and Hynd's (1994) study could reliably detect bias in sources.

The differences between the groups seem to be tied to differences in the way readers view text. High school students tend to view texts as repositories for facts, as bearers of information. For example, they tended to rate textbooks as more trustworthy than source documents, a finding replicated by Perfetti et al. (1993) and Stahl and Hynd (1994). Historians tended to view texts as "speech acts," produced for a particular purpose by a particular person. To understand the texts involves understanding both the person and the purpose, and to get at the truth hidden within the texts involves comparing various perspectives with an understanding of who produced the various texts and why. The students in Perfetti et al.'s study were able to grasp the basic story of the Panama Canal Treaty from documents describing the events leading up to the signing of the Treaty in 1903. Similar to the students in the 1990 NAEP, they had difficulty providing evidence for their viewpoint when asked to critically analyze the events.

Getting students to move from the position of "received knowledge" (Belenky, Clinchy, Goldberger, & Tartule, 1987) to that of "constructing knowledge" from a variety of opinions and sources, as Wineburg (1991a, b) found historians do, requires both different uses for text and different teaching techniques.

One technique proposed to develop disciplinary knowledge is the use of multiple texts. In a series of studies, Stahl, Hynd, and their colleagues (Stahl, Hynd, Britton, McNish, & Bosquet, 1996; Hynd, Stahl, & McNish, 1996) found that high school students are not effective at using multiple texts to learn historical information. They focused on the Gulf of Tonkin incident and the subsequent Senate resolution that became President Johnson's justification for escalating the Vietnam War. They found that students did gain in the consistency of their mental models after reading at least two documents, but did not make any further gains after that. When compared to lay experts, they failed to make any growth after a first reading. Examining their notes, we found that students tended to take literal notes, regardless of the final task, suggesting that they were using the initial readings to garner the facts about the incident or the resolution. If students were asked for a description, they tended to stay close to the text. If asked for an opinion, however, they tended to ignore the information in the texts they read, even though they may have taken copious notes. The researchers' observations suggest that high school students may not be able to profit from multiple texts, especially those presenting

conflicting opinions, without some additional instruction.

The purpose of this paper is to replicate the Stahl, Hynd, Britton et al. (1996) study, using the topic of Christopher Columbus. Columbus represents a different problem than the Gulf of Tonkin incident. The Gulf of Tonkin incident (and indeed the Vietnam War) were largely unknown to these students; students' knowledge of Columbus is extensive, but full of misconceptions. Questions remain about what really happened in the Gulf of Tonkin incident. The facts about Columbus are clearer. Therefore, the study of Columbus represents an interesting contrast to the Stahl et al. study.

Method

Participants. The participants in the study were 111 ninth-graders drawn from four social studies classrooms in two separate north Georgia high schools. Both schools were in the same small college-town community and, due to a vigorous busing policy, had very similar student bodies.

Three of the classes were from a school that was experimenting with a *team teaching* concept in which the three classes were kept intact and rotated among the same *interdisciplinary team* of teachers for at least these three subjects per day: language arts, science, and social studies. This part of the sample consisted of 84 students, 28 in each of the three classes, who had been placed either by virtue of being classified as advanced or by parental request. The overall composition of these participants, as well as those at the other high school, was roughly 65% Caucasian and 35% African American, nearly all of middle to upper socioeconomic standing. The remaining 27 participants, at the other high school, were in an average class and not in a team teaching situation. But in every other way they were similar to those at the other location.

Only students who participated in all three sessions were included in the study. Because of attrition due to absenteeism over the duration of the study, the sample size diminished from the original 111 to 85.

Materials. Materials for the study consisted of two parts: a fairly extensive preassessment, which examined participants' attitudes toward Christopher Columbus and the indigenous peoples he discovered in the New World; and the three sequenced text readings themselves, along with their accompanying assessment items.

Preassessment. Consisting of three main sections, the preassessment was administered to each of the participants during a single class period. The preassessment was composed of three short parts. Part one asked the participants to supply three adjectives that they thought characterized Christopher Columbus and to tell why they thought so. Part two was the Attitude scale, which included items assessing students' attitudes toward Columbus and Native Americans. The third part was the Misconceptions scale and was composed of six statements about Columbus measured on a six-point response range from Definitely False to Definitely True. These statements were all common misconceptions about Columbus, such as "Columbus was the first to believe that the world was round" or "Columbus was regarded as a great man during his time."

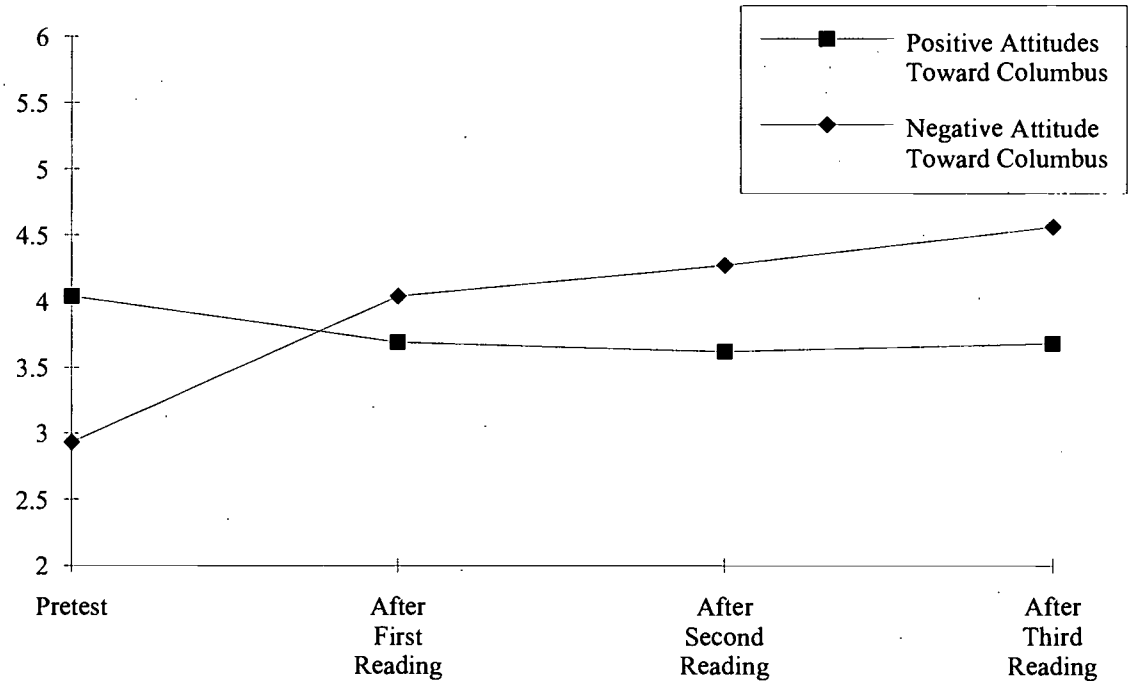


Figure 1. Mean adjective ratings before and after the first reading, by selection.

Sequenced text readings. Some days after the administration of the preassessment, each participant was presented with a packet of three readings chosen at random from four possible texts: one straightforward encyclopedia entry;[1] articles from *Newsweek* and *Time*, presenting both positive and negative views of Columbus, written for the quintcentennial; a revisionist article by Kirkpatrick Sale (1992) taken from *The Nation*; and a counter-revisionist article written by Arthur Schlesinger (1992) taken from *The Atlantic Monthly* in which Schlesinger attempted to counter the arguments made by Sale and others. The order in which the three texts were presented within participants' packets was also randomized.

The articles were read one per day over three consecutive days. Each of the three readings was accompanied by the same short Columbus/Native American attitude measures and the six misconception items the participants had responded to in the preassessment described above.

[1]Although this article was intended to be neutral in tone, it did contain some of the revisionist information about Columbus's voyages and their negative effect on indigenous peoples.

Table 1
Attitudes Toward Columbus Before and After Readings

	Mean	Standard Deviation
Positive Attitudes Toward Columbus		
Before Reading	4.04	0.83
After 1 Reading	3.69	0.86
After 2 Readings	3.62	0.88
After 3 Readings	3.68	0.85
Negative Attitudes Toward Columbus		
Before Reading	2.93	1.29
After 1 Reading	4.04	1.33
After 2 Readings	4.27	1.35
After 3 Readings	4.56	1.35

Results

Attitude measure. The results from the Attitude toward Columbus measure are shown in Figure 1. As shown on this figure, students' attitudes toward Columbus were reasonably positive at the pretest. They gave an average rating of 4.04 out of a possible 6 on the seven items reflecting positive attributes. They also gave a considerably lower rating (2.93 out of a possible 6) on those items reflecting negative attributes. These ratings underwent a marked change after one reading. As shown in Table 1, students' ratings of Columbus on the positive attributes were significantly lower ($F(3,219) = 7.77, p < .001$) after one reading and stayed at that level through subsequent readings. Their ratings on the negative items mirrored those on the positive items. Their negative perceptions of Columbus rose significantly ($F(3,219) = 38.33, p < .001$) after one reading and continued to rise slightly after subsequent readings.

Because the effects were found only after the first reading, we analyzed the changes between the pretest and first readings for each different article (or sets of articles) read. This analysis is shown on Figure 1. As noted in that figure, the articles from *Newsweek* and *Time* produced the strongest effects on both negative and positive attitudes toward Columbus. Surprisingly, the article from *The Nation*, which has the strongest negative tone, produced the least change in negative attitudes.

There were no significant changes in attitudes toward Native Americans as a result of reading the articles.

Adjectives. Our ratings of the adjectives[2] that students used to describe Columbus prior to the readings and after each reading confirmed the trends found on the knowledge and attitude measures. There were 780 total responses, using 225 different adjectives. Of this number, the two most popular were "Adventurous" and "Greedy" (82 responses apiece, 10.5% of the total), followed by "Brave" (30 responses), "Determined" (25 responses), "Smart" and "Wise" (22 responses apiece). Two of the authors rated each adjective on a five point scale: +2 (Very Positive, e.g., "Brave," "Wise"), +1 (Positive, e.g., "Adventurous," "Religious"), 0 (Neutral, "Sailor," "Wanderer"), -1 (Negative, "Greedy," "Selfish"), and -2 (Very Negative, "Cruel," "Murderer"). We had a 93% interrater agreement. All disagreements were resolved by taking the higher of the two ratings. These ratings were used to track students' changing attitudes toward Columbus as they read each selection.

The adjective data were analyzed in two steps. First, we compared the ratings after the pretest and after each reading. Students' ratings of Columbus were generally positive on the pretest (Mean = .927, s.d. = .726), but dropped markedly after the first reading (Mean = -.015, s.d. = .935). They stayed low after the second reading (Mean = -.1932, s.d. = .904) and after the third reading (Mean = -.129, s.d. = .902). A Repeated Measures Analysis of Variance found that the overall effect for Time was statistically significant ($F(3,177) = 28.45$, $p5 < .001$). A series of Bonferroni-adjusted t-tests found significant differences between the pretest and the subsequent readings, but the differences between the ratings after the first, second, and third readings were not significant. Because the first reading had the largest impact on students' attitudes toward Columbus, as in the analysis of the attitude statements, we analyzed the changes between the pretest and first readings for each different article (or sets of articles) read. Again, the *Newsweek* and *Time* articles had the largest effect on students' perceptions of Columbus. This effect was more dramatic on this measure than on the Attitude statements, with the group first reading the *Newsweek* and *Time* articles the only group dropping from Positive adjectives to Negative adjectives after a single reading.

Misconception measure. The responses to the Misconception statements following each passage showed a different pattern. All the statements were discussed as being false in the articles. A repeated measures Analysis of Variance found a significant growth in students' acceptance of the falsity of four of the six statements—"Columbus was the first to believe that the world was round" ($F(3, 213) = 4.75$, $p < .005$), "Columbus was regarded as a great man during his time" ($F(3, 207) = 3.07$, $p < .05$), "Columbus was Spanish" ($F(3, 210) = 3.33$, $p < .05$), and "Columbus knew he discovered a new world" ($F(3, 210) = 2.88$, $p < .05$). For the first three of these statements, a significant linear trend was also found, suggesting that students' acceptance of the falsity of these misconceptions grew after each reading. These trends are shown in Figure

[2]Students did include other parts of speech, but the vast majority were adjectives.

3. An analysis of the effects of individual texts on these questions did not find any effects on students' learning about Columbus due to the texts.

Discussion

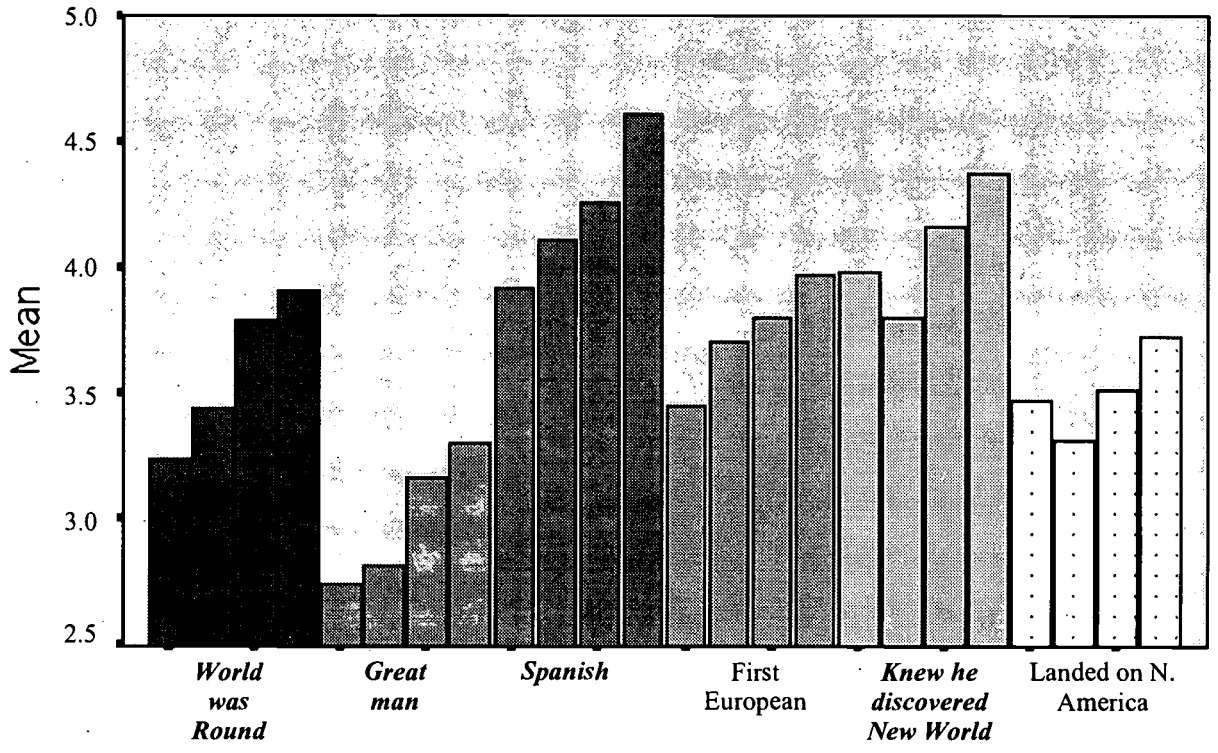
There were three basic findings in this study. First, students' attitudes toward Columbus changed initially after the first reading and tended to remain stable after that. Students' attitudes toward Native Americans were unaffected by the text reading, but tended to be generally positive and remain so. Second, the articles from *Newsweek* and *Time* had the greatest impact on students' attitudes toward Columbus, and the Sale (1990) text with its outright negative tone had the least impact. Third, students' misconceptions about Columbus tended to change slowly after each text reading, in contrast to their attitudes. These will be discussed in turn.

We had anticipated that students' attitudes toward Columbus would change gradually as they read more. This did not prove to be the case. Instead, their attitudes changed after one reading, but remained stable after that. There are several possible explanations for this pattern. One explanation is that students realized that we expected a more negative view and changed their attitudes in accordance with that view. This is a possibility, but we did not find a similar pattern on the Misconception measure. We asked students whether each reading changed their view of Columbus. Their written comments suggest that students did not seem to want to change their mind. It may be that students cannot accommodate too much restructuring in a short period of time.

The lack of an effect of the Sale (1992) article was also surprising. Again, the written comments suggested that students recognized its more strident tone and rejected his arguments because of their stridency. The *Newsweek* and *Time* articles were more like the refutational texts that Guzzetti et al. (1993) found to be effective in helping children overcome misconceptions in science text. In this study, refutational texts proved best at changing students' attitudes toward Columbus because of their perceived fairness. By presenting both the positive and negative facts about Columbus, the *Newsweek* and *Time* articles were better able to lead to restructuring of students' attitudes, from the Columbus of the children's rhyme to the Columbus who brought European hegemony (and all it entailed) to the Americas. Since the most balanced texts presented a view of Columbus that was more negative than that which is conventionally presented, students had less difficulty in changing their attitudes.

Such refutational texts did not have any greater effect on students' misconceptions than did other texts. Instead, all of the texts had similar effects on misconceptions, which changed slowly over the course of multiple readings.

Misconceptions in history and misconceptions in science differ in significant ways. One can reliably measure the trajectory of a ball following Newton's laws of motion. Misconceptions in social science, however, are less clear. Much of social science is opinion, albeit opinion backed by facts. But social scientists



Note: Italics indicate significant differences. Bars range from Pretest through third reading from left to right.

Figure 2. Mean responses to misconception statements.

differ on the relevancy of certain facts and how those facts are put together to make an argument.

Changing a preconception involves the difficulty of restructuring a schema; therefore, it is not surprising that restructuring preconceptions requires more exposure to different texts than changing attitudes. It appears to take continued exposure to facts, presented in different contexts, to change students' preconceptions. For example, in the Tonkin Gulf study (Stahl, Hynd, Britton et al., 1996), students' conceptions did not change much after a single reading. But in that study, students had little idea about the Tonkin Gulf incident in specific or about the Vietnam War in general. The initial reading gave them the basic information about the topic; subsequent readings did not make as large an impression. In the present study, students knew the basic information about Columbus (1492, Ferdinand and Isabella, the three ships, the four voyages, etc.), but much of it was different than the views of the contemporary historians used in this study. These pre-existing schemas took more time to change, since they were more embedded.

Study of the growth of disciplinary knowledge in history through the reading of multiple documents requires multiple studies, using different sets of documents. The sets of materials used here differed from the earlier studies of Stahl, Hynd, Britton et al. (1996) who used the Tonkin Gulf Incident as a topic, and Perfetti et al. (1995) who used the signing of the Panama Canal treaty. Students had little preexisting knowledge of these historical events and thus had little to change. We found it more difficult to change students' conceptions about Columbus than did Stahl et al. or Perfetti et al. to change preconceptions about less well-known events. Attitudes, however, seemed to change rapidly. We need to further vary the text types, the perceived partiality of the documents, the length of the documents, and so on to get a view of the effects of reading multiple-text documents on students' learning of history.

Hoffman (1992) suggests an approach to teaching elementary school students to think critically about Columbus. He suggests that students generate guiding questions and examine how different sources treat these different questions. Hoffman uses a graphic organizer to integrate this information. Such a procedure might be a useful approach to teaching students to integrate material such as this.

Multiple-source documents can be a supplement or an alternative to conventional history texts, and increasingly are being used as such. The effects that studying source documents have on students' learning and attitudes may depend on their prior knowledge and the nature of the texts used. Research on how useful this practice is will depend on multiple replications, using different topics and different texts with students of diverse abilities and preconceptions.

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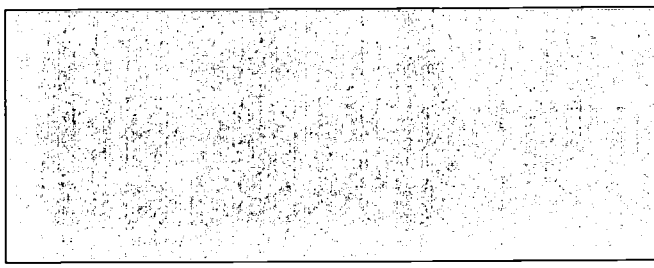

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