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Improving SAT reading scores by using metacognitive reading strategies

John Leddo[1], Qianqian Hong[2], Nandini Shyamala[3], Aaron Xue[4]
[1] Director, MyEdMaster, Sunrise Valley Drive, Herndon, VA, USA
[2-4] MyEdMaster, Sunrise Valley Drive, Herndon, VA, USA

Abstract
Standardized testing is widely used in countries around the world and is often associated with high stakes as schools use test results in their admissions and graduation/certification decisions. Because of the importance of these tests, a plethora of test preparation services have arisen, many of which teach generalized test taking strategies. Given that research suggests that these programs produce modest improvement in reading scores, the present study investigated whether teaching metacognitive reading strategies would lead to improved reading performance on the SAT test, which is widely used in college admission decisions. Participants were students in both the United States and China who were studying for their SAT and PSAT exams. Half of the students were taught standard test taking strategies and the other half were taught metacognitive reading strategies. Both groups were then given a full SAT reading test and instructed to use the strategies they were taught. Results showed both a main effect and an interaction. Students using the metacognitive reading strategies scored higher than those using standard test taking strategies. The effect was stronger for American students than it was for Chinese students. Results suggest that metacognitive reading strategies can lead to higher reading scores on the SAT and further research can indicate whether this applies to other standardized tests as well.

Keywords: strategies, standardized, SAT, Chinese, American

Introduction

Standardized testing is pervasive in education. Such testing is used to determine whether students have successfully mastered course material, graduate, or gain admission into schools. In the United States, for example, the SAT and ACT tests are heavily considered among the admission criteria for most colleges. In countries like China, standardized testing is almost the sole determining factor as to which college a student attends. As a result, providing test preparation services has become a substantial industry, one that offers to help students increase their test scores.

Given the expense associated with test preparation classes, a major question arises as to how effective such test preparation services are. Indeed, there is some empirical evidence that most test preparation services produce very little effect. For example, Becker (1990) [1] reports that test preparation typically raises SAT scores by only nine to 20 points, a negligible amount. Such nominal improvement may be attributable to the fact that many test preparation services focus largely on test taking skills such as time management and evaluating answer choices and less on core skills such as reading comprehension and mathematical concepts. This low increase in test scores is plausible since most test preparation courses are of limited duration, while reading and mathematical skills are typically developed over a period of years.

The present research examines the question of whether SAT (and by extension, other standardized) test scores can be increased by teaching generalized skill-based strategies. Given that the SAT and virtually all standardized testing includes reading as one of the subjects tested, reading comprehension was chosen as the testbed for the present research. Metacognitive strategies were selected because, like general test-taking strategies, they can be applied to a wide range of passages.

The use of metacognitive strategies in reading has drawn considerable interest in the research community (Ahmadi, 2013; Alshumaimeri, 2011; Al-Sobhani, 2013; Dagget & Hasselbring, 2007; Koda, 2007; Louca; 2003) [2, 3, 4, 5, 6, 7]. A lot of the research has focused on whether readers spontaneously use metacognitive reading strategies and, if so, which ones do they use (Paris, 1984, 1990) [8, 9].

Because the goal of the present study is to focus on using metacognitive reading strategies to improve reading scores on standardized tests over and above what is normally found by using standard test taking strategies and there are numerous metacognitive reading strategies available for readers to use, we wanted to investigate metacognitive reading strategies that seem most beneficial for standardized tests, particularly the SAT. In order to do this, we drew upon our experience as a tutoring company

One of the challenges that students frequently report when reading SAT passages is that they do not understand the content of a passage. This makes it difficult for them to answer the questions. Another challenge reported is that students frequently run short on time, given that the SAT has five passages and 52 questions that must be answered in 65 minutes, which comes to an average of 13 minutes to read a passage and answer 10 or 11 questions. Students often report that it is time consuming to reread passages to find answers to the questions posed.

Given that there is a plethora of metacognitive reading strategies that could be applied to standardized testing, we chose to select metacognitive reading strategies that addressed these two commonly mentioned challenges. Specifically, we looked for metacognitive reading strategies that could be generalizable across passages and question types that would both increase comprehension and reduce

time while increasing accuracy. One of the metacognitive reading strategies discussed in the literature is prediction, which is designed to help readers understand text by predicting what content is likely to appear in the passage. This technique may be especially helpful for SAT reading since the types of reading passages are pre-defined by the College Board. Therefore, it is possible to analyze these types of passages for how they are organized and for the type of content they may include. This analysis can help readers understand the content of the passage, where to look for information to answer questions and what the likely answer to a question will be, all of which can increase accuracy and time required to answer questions. An example of this is presented in the procedure section.

The present study, then, investigates whether using metacognitive reading strategies can lead to higher performance in SAT reading than using standard test taking strategies. Participants were students who were studying for the SAT and PSAT (which has the same type of content) tests.

Methods

Participants

The present study was conducted with students in both the United States and China. United States participants were 36 students who were attending PSAT and SAT test preparation classes at tutoring centers in Fairfax and Loudoun counties in Virginia. These students were chosen because they represent the population of students who would be taking a PSAT or SAT test in the foreseeable future and therefore were motivated to learn reading techniques that would help boost their SAT reading scores. Chinese participants were 24 10th grade students enrolled at Suzhou Foreign Language School, an international school in China that prepares Chinese students who wish to attend school internationally. These students would also be taking the PSAT and SAT tests as part of the process of applying to schools outside of China. Therefore, like their American counterparts, the Chinese students would also be motivated to learn reading techniques that would help boost their SAT reading scores.

Materials

There were two types of SAT materials that were used in the present study. The first is SAT practice test 8, a full-length SAT test created by the College Board, the makers of the SAT test and offered to the public as practice for the actual SAT. Like the actual SAT test, it contains five reading passages and a total of 52 questions that are based on the passages. Practice test 8 was chosen since it was the last of eight practices tests offered by the College Board and was considered the one least likely to have been seen by the participants prior to the present study (the verification of which is described in the procedure section).

The five SAT reading passages always fall into the following categories: one dual passage (two passages written by different authors examining a similar topic) that is historical in nature, a work taken from literature, a passage from the social sciences and two scientific passages. The five reading passages of SAT practice test 8 are a memoir (representing literature), a social science passage arguing against a particular passage, two science passages, and a dual passage. Of the two science passages, one presented a new discovery regarding an otherwise well-known substance and one described how a particular process worked. The dual passage presented opposing points of view on the matter of slavery taken from speeches given during the famous Lincoln-Douglas debates.

In addition to SAT practice test 8, there were five additional passages that were given to participants so that they could practice the reading strategies associated with the conditions they were in. Of the five additional passages, one was a memoir, one was a social science passage, two were science passages and one was a dual passage. The passages were selected to be close to SAT practice test 8 passages in terms of type and variation of content.

Procedure

Participants were randomly assigned to one of the two reading strategy conditions (standard test taking strategies, metacognitive reading strategies). Participants were then taken through the following process that was iterated for each passage they were given: instructions on strategy, practice with a passage, testing on SAT practice test 8.

Students in the standard reading strategies condition were given strategies that were taken from the College Board website itself and from other tutoring services. These strategies included: reread the test before answering questions; read all the answer choices before answering; summarize the story; scan the headings; take notes; check to make sure that the question you are answering in the answer sheet matches the one in the passage.

Students in the metacognitive reading strategies condition were given strategies that were tailored to the structure of each type of passage to facilitate comprehension of the author's main point and argument. For example, for the memoir, students were told that a memoir typically has three main sections. The first describes what was happening in the author's life at the time a key event occurred. This description helps explain why a key event was so meaningful to the author. The second section describes a key event that happened to the author and any people who were associated with the event. The third section describes how the event changed the author's life. Students were instructed to interpret what they read in terms of these three principles and to summarize, prior to answering the questions, the general conditions of the author's life, the key event and any people involved, and how the event changed the author's life.

For the general reading strategies condition, all strategies were presented to the student at once since these strategies were the same for each passage. For the metacognitive reading strategies condition, the strategies varied based on the passage type and therefore were presented before each passage. After the strategies were presented, each participant received a practice passage that was of the same type as occurred on SAT practice test 8. After reading the practice passage, each participant received a passage from the SAT practice test 8. Therefore, students did not receive the whole SAT practice test 8 reading section at once.

Results

Only the responses to the questions from SAT practice test 8 were scored. There were 52 questions in total, the number in an actual SAT reading test. The number of questions correctly answered out of 52 questions was tabulated for each student. The mean number of correctly answered questions, by condition, is shown in Table 1. A two-way analysis of variance (ANOVA) was performed on the data.

The results of the ANOVA showed that there was a statistically significant main effect for reading strategy, $F(1,52) = 31.1$, $p < .001$, suggesting that students using the metacognitive reading strategies performed better than those using the standard reading strategies. The results of the ANOVA showed no main effect due to country ($p > .10$, ns), suggesting that there was no difference in overall performance between American and Chinese students. Interestingly, the results of the ANOVA did show a reading strategy by country interaction, $F (1, 52) = 5.64$, $p < .05$. This suggests that, while the metacognitive reading strategies produced superior performance in both American and Chinese students, the effect was stronger in American students than it was in Chinese students.

Table 1: Mean Number of Questions Answered Correctly Based on Strategy and County

	Metacognitive	Standard
United States	41.63	29.06
China	40.25	35.58

Discussion

The results suggest that using metacognitive reading strategies results in higher scores in SAT reading passages than using standard reading strategies as recommended by the College Board itself and other tutoring centers. This effect held up in both the American and Chinese students. Across the board, participants averaged 41 correct answers out of 52 questions in the metacognitive reading strategies condition and just under 32 correct answers in the standard reading strategies condition. 41 correct answers in SAT practice test 8 corresponds to a reading subscore of 31, which translates to an overall reading score of 620. 32 correct answers translates to a subscore of 27, which translates to an overall reading score of 540. A score of 620 corresponds to an 84th percentile performance, while a score of 540 corresponds to a 62nd percentile performance. Therefore, the results suggest that using the metacognitive reading strategies presented in the present study increased student performance by 80 points and the percentile ranking by 22.

The results also showed an interaction effect. While metacognitive reading strategies produced higher performance in both American and Chinese students, the effect was stronger in American students. Here, the improvement was nearly 13 extra correctly answered questions, which translated to an SAT reading score of 640 vs. 520 or a 120-point improvement and percentiles of 88 and 55 or a 33-percentile improvement.

It is not immediately clear why this interaction effect occurred. One possibility is the difference in test taking between the two countries. In China, high-stakes testing is far more prevalent than it is in the United States. For example, in China, high school students take the Chinese National College Entrance Exam, which is the sole determining admissions factor for the majority of colleges in China. Therefore, test preparation is far more engrained in Chinese culture than it is in American culture. It is possible that Chinese students were more familiar with the standard test taking strategies (which are general in nature) than they were with the metacognitive reading strategies (which are particular to reading passages only). This is consistent with the data as Chinese students scored slightly higher than American students when using general reading strategies (although these differences were not statistically different) and virtually identical to American students when using metacognitive reading strategies.

Conclusion

As noted in the Introduction, people all over the world take high stakes reading assessments. Typical standardized reading strategies focus on test taking tips rather than what the actual content is. In the present study, participants were taught the organizational structures and types of content found in different categories of reading passages and were told to classify passages and abstract out the details of the different types of content (the metacognitive reading strategies). Adopting these strategies led to increased test scores, suggesting that metacognitive reading strategies should be including as part of standardized test preparation.

There is a secondary benefit from including the metacognitive reading strategies. Standardized testing often comes under fire for measuring test taking skills rather than the underlying content skills. When students are taught test-taking strategies in preparation for taking standardized tests, this feeds into this criticism. By showing that metacognitive reading strategies lead to higher performance than does test-taking strategies, it adds credibility that standardized testing measures reading skills, even if also measuring test taking skills.

The present research should be extended to other subjects tested by standardized testing. This will extend the present findings, so that it can be determined whether metacognitive strategies can be used widely to improve test scores.

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