

# Research: The Commas Strategy

## Study 1

### Overview

The Comma Strategies Program is an interactive multimedia program that students can use to learn how to use commas in their writing. Two studies have been conducted on this program. In the first study, 12 students with LD participated in a multiple-baseline across-students design. The students were enrolled in grades 9-12.

### Results

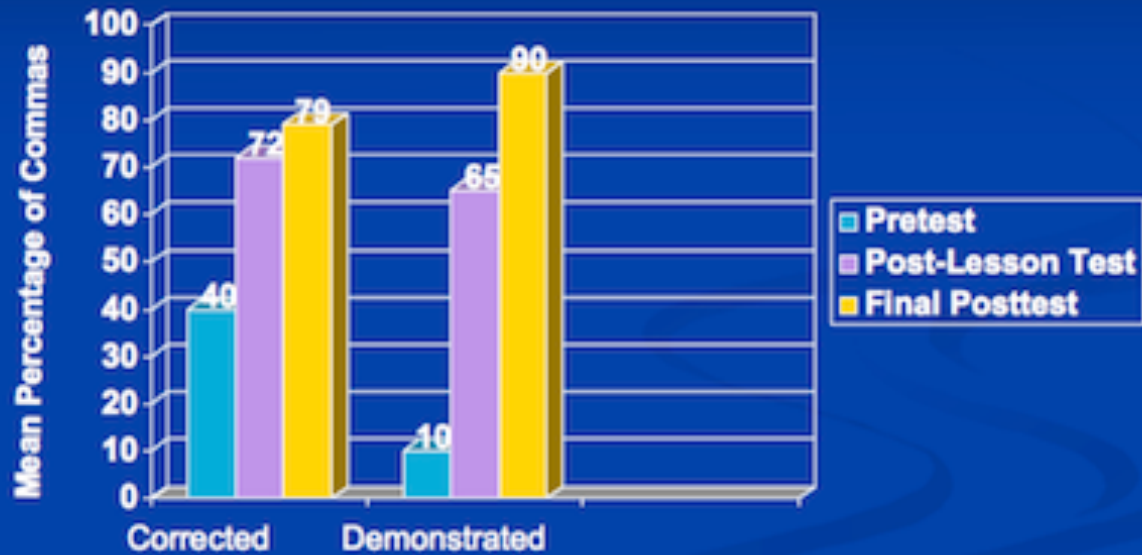
Two measures were gathered in this study. Students took a series of tests. Each test was comprised of 25 sentences in which students had to insert commas in order to make the sentences correct. They also wrote their own sentences to demonstrate their understanding and use of commas.

Figure 1 displays the mean percentage of commas errors students corrected in sentences as well as the mean percentage of comma rules they demonstrated correctly during baseline and after instruction. The mean baseline test score on the commas correction test was 40% (range = 16% to 72%). The mean post-instruction score was 71.89% (range = 48% to 96%). The mean test score on the final test administered after students had completed the whole program was 78.67% (range = 52% to 96%). The effect size was 4.5, calculated using Cohen's d which was adjusted for the correlation between the pretest and posttest scores. This is a very large effect size.

With regard to demonstrating use of the commas rules, the mean baseline test score was 9.52% (range = 0% to 50%). The mean post-instruction score was 64.83% (range = 25% to 100%). The mean test score on the final test administered after students had completed the program was 89.58% (range = 75% to 100%). The effect size was 3.1, calculated using Cohen's d. Again, this is a very large effect size.

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## Figure 1: Commas Program Results for Study 1



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## Study 2

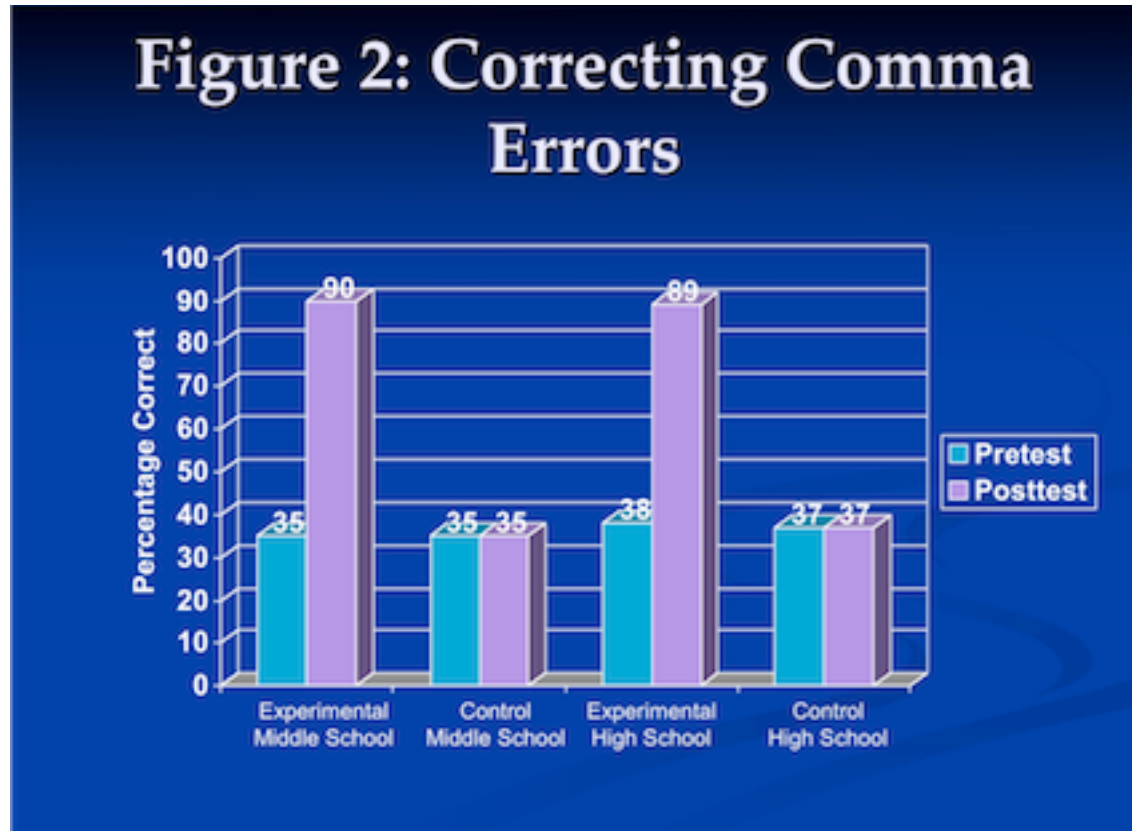
### Overview

This study was a larger field test of the Comma Strategies Program than Study 1. A total of 82 middle-school students and 41 high-school students with LD participated. They were randomly selected into an experimental and a control group at each level of schooling. Students in the experimental group worked through the Comma Strategies Program. Students in the control group worked through another CD program for the same amount of instructional time. A pretest-posttest control-group design was used.

### Results

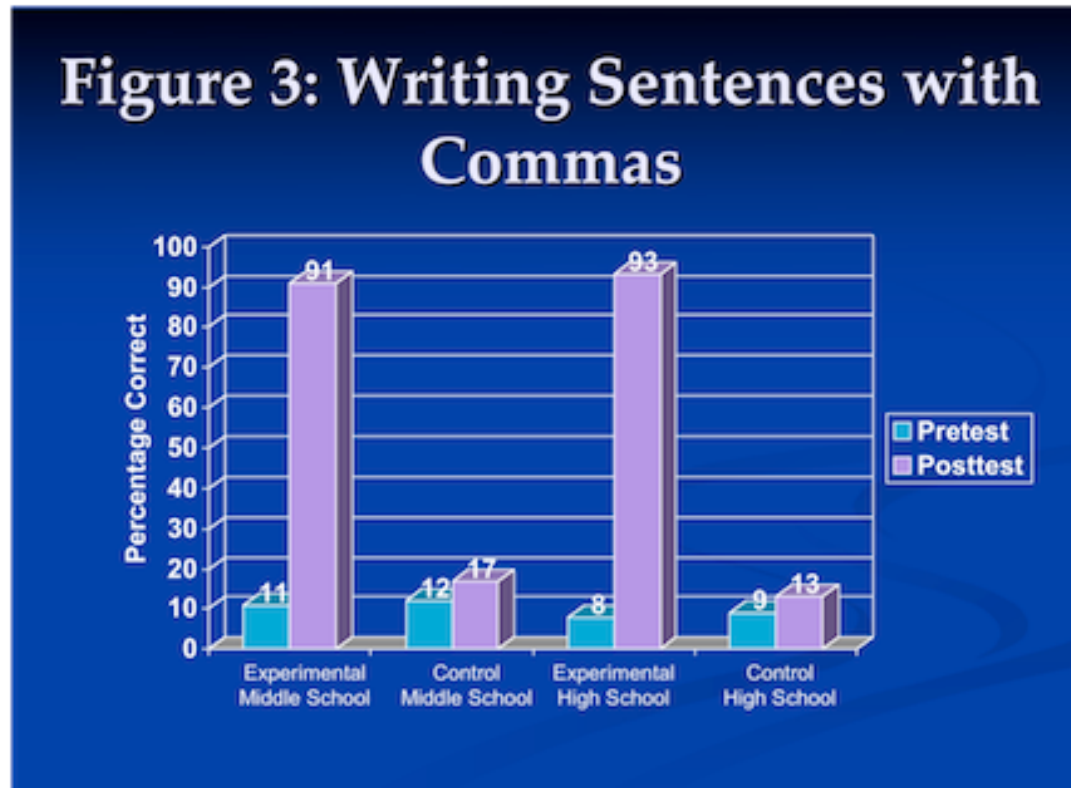
Figure 2 displays the pretest and posttest results for middle-school and high-school students on the test where students inserted commas into sentences to correct errors. The mean percentage of errors that both experimental and control students corrected on their pretests was 36%. On the posttest, the whole group of experimental students corrected an average of 90% of the commas errors, and the whole group of control students corrected an average of 36% of the errors. The experimental students' results ( $M = 90\%$ ) compared favorably to the results of same-age comparison students without disabilities who inserted a mean of 50% of the missing commas correctly without instruction. An ANCOVA indicated that the difference between the two groups of students on the posttest was significant [ $F(1,120) = 497.28, p < .0005$ ], in favor of the experimental group. The effect size (partial eta squared) was .806, a very large effect. There was no difference in the way the middle-school students and high-school students responded to the program. (See Figure 2 for the results for the middle-school and high-school students.)

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Figure 3 displays the pretest and posttest results for the test where middle-school and high-school students demonstrated use of commas in their own writing. On the pretest, averages of 10% and 11% of the commas rules were demonstrated correctly by the whole groups of experimental and control students, respectively. On the posttest, the whole group of experimental students demonstrated 92% of the commas rules correctly, whereas the whole group of control students demonstrated 15% of the rules correctly, on average. Again, the difference between the two groups of students on the posttest was significant [ $F(1,120) = 943.66, p < .0005$ ], in favor of the experimental group. The effect size for the difference (partial eta squared) was .887, also representing a very large effect. No differences were found between the middle school and high school students' performances.



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## Conclusions

The Commas Strategies CD program is an effective means of teaching comma strategies to students with LD. All students reached mastery on all the lessons in the program. Experimental students' use of the strategies increased from pretest to posttest, and their posttest scores far exceeded the scores of a control group and a same-age comparison group of students without LD. Experimental students' posttest scores were significantly different from the posttest scores of the control students after the pretest scores were used as a covariate. Effect sizes were very large across the measures. Since no differences were found between middle-school and high-school students' scores, the program appears to be equally effective for students at both school levels.

## Reference

Schumaker, J. B., & Walsh, L. (2008). Effects of a hypermedia program on the use of commas by students with learning disabilities. Phase II Continuation Report for SBIR Grant #5 R44 HD043618-03.