Cup Stacking and its Effect on Reading Scores in Sixth Grade Elementary School Students

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ABSTRACT

The purpose of this study was to use cup stacking, a brain-based activity, to see if there are any differences on the STAR Reading Test Scores for those who participate in cup stacking and for those who do not. The STAR Reading Test was used to assess students' reading level before and after the study. The experimental group received cup stacking twice a week for four weeks between testing, and the control group did not. It was found that the experimental group who used cup stacking (n = 12) achieved higher scores on the STAR Test during the posttest than the control group, which had no cup stacking instruction (n = 12). It was concluded that the brain-based activity of cup stacking might have contributed to the increase in the achievement level of the experimental group on the STAR Reading Test.

INTRODUCTION

There has been a great deal of research in the area of brain-based teaching methods during the last 20-30 years, some of which supports the claim that they work by intensive research. Many educators and teachers have experienced some encounter with left brain/right brain methods, but most have failed to fully implement these methods (Sousa, 2001).

Researchers are constantly providing new proven methods for educators to use in brain-based teaching. Activities which involve left to right movements and cross the midline of the body support this type of research. Cup stacking is one such activity. Students who participate in cup stacking enjoy this activity and it has been linked to improvements in reading because it uses the same connections in the brain that are used for reading (Fox, 2001). The STAR Reading Test will be used in this study because it is a quick and accurate way to measure reading comprehension.

Statement of the Problem

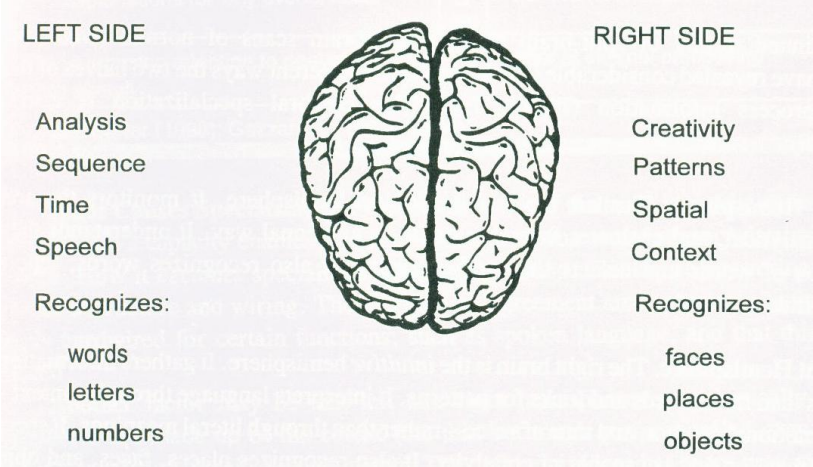
The purpose of this study was to investigate the effects of using cup stacking, which involves bilateral proficiency, to improve reading scores.

Review of Related Literature

Cup stacking involves up stacking and down stacking a set of three, six, or twelve cups in a predetermined order. Its benefits include improving hand-eye accuracy, ambidexterity, bilateral proficiency (equal performance on both sides of the body), and exercising both sides of the brain and body (Fox, 2001; Blaydes, 2003). When bilateral proficiency is developed, a greater percentage of the right side of the brain which houses awareness, focus, creativity, patterns, and rhythm are utilized.

Brain Gym operates on the same concept of coordinating the brains and the bodies better. The researchers at Brain Gym state:

> Focus is the ability to coordinate the back and front areas of the brain. It is related to comprehension, the ability to find meaning, and the ability to experience details within their context. People without this basic skill are said to have attention disorders and difficulty in comprehending (Maguire, 2001).



This figure shows that the right and left hemispheres of the human brain are highly specialized and process information differently (Sousa, 2001).

Cup stacking incorporates crossing the vertical midline of the body using left-to-right movements. These are the same movements that are used in reading. To be a successful reader, one eye must be dominant for focusing, the other for blending (Maguire, 2001). When the

midline is crossed, the visual fields in the brain overlap. This is fundamental to reading, writing, communicating, and problem solving if learning is to take place.

According to Paul Dennison, author of *Brain Gym: Simple Activities for Whole Brain Learning*, students must cross the midline, which connects the right and left brain. It is important for reading fluently, comprehension, writing creatively, spelling and remembering, listening and thinking at the same time, and increasing our athletic performance (Blaydes, 2001). In studies using Brain Gym techniques to develop both sides of the brain and body, it was found that the reading scores got better, rising from 55% to 89%, while the scores of the control group that received no Brain Gym support improved only 0-16 points (Maguire, 2001).

Bob Fox (2001), president and founder of Speed Stacks, Inc. purports that cup stacking can lead to bilateral proficiency, but I was unable to find any published research to support this claim. Two universities, however, are now in the process of doing research on this very topic.

Hypothesis

I hypothesized that using cup stacking to increase bilateral proficiency would increase reading scores for sixth graders. Those students completing the cup stacking activities would perform better on the STAR Reading Test than those who did not complete the cupstacking.

METHOD

Subjects

My subjects were 24 black sixth grade students who had scored a Level II on the 5th Grade End of Grade Reading Test in May 2002. A Level II represents that they were below grade level. There were twelve girls and twelve boys. These students were divided in half with seven girls and five boys in the experimental group and five girls and seven boys in the control group. Homeroom teachers divided them into these groups. None of the participants in either

group had practiced cup stacking activities in the past. They were not students from my reading or physical education classes. They represented several reading classes from our school. Participation for each group was optional.

Materials

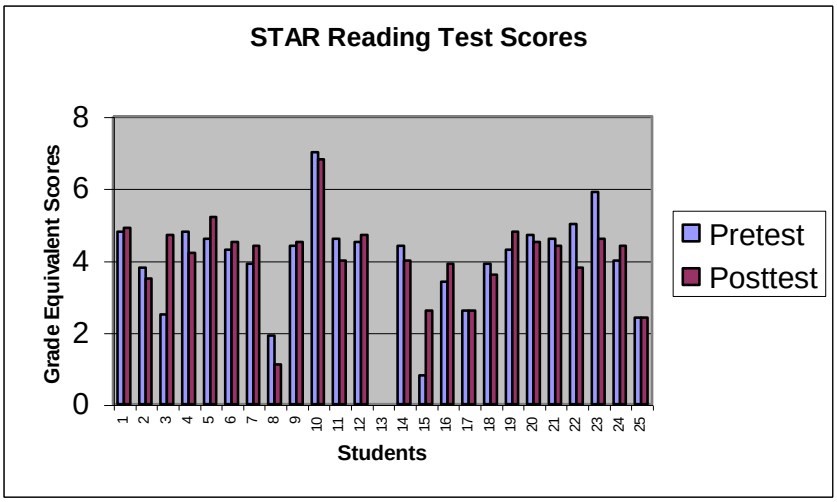
The materials used were *Speed Stacks* cup stacking sets. Cup stacking was selected because it is an activity which, when done correctly, crosses the midline of the body. The Star Reading Test was also used as a pretest and posttest for both the experimental and control group. This test allows you to determine the appropriate level of challenge in reading for each child. It uses twenty-five in-text vocabulary questions plus authentic text passages to give you a precise measure of each student's reading performance. It provides a score with the child's grade level and month. (Example: 4.3 = fourth grade, third month).

Procedures

All of the subjects gathered in the computer lab before doing the STAR Test so that the purpose of the study could be explained to them. They were told that half of them would participate in an additional activity and, while one group would simply come back for a posttest. The STAR Test took 10-20 minutes for students to complete. The study was designed to last for four weeks, but took five because of scheduling conflicts.

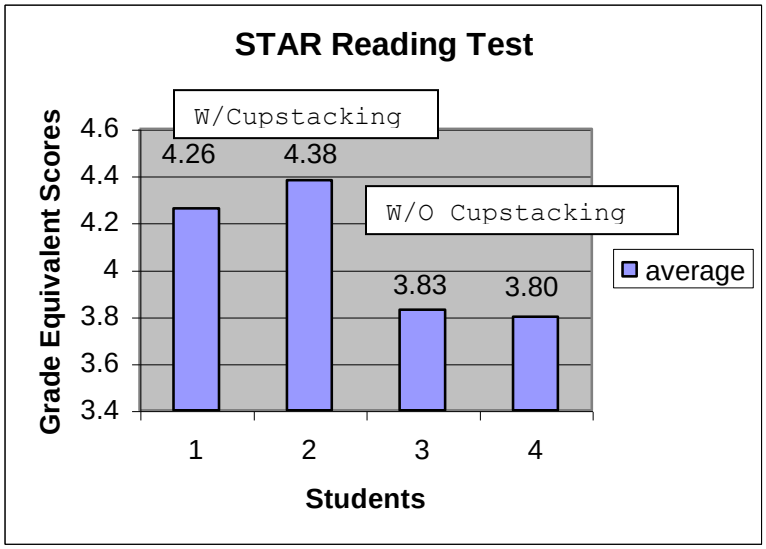
The experimental group participated in twice a week sessions of cup stacking lessons that lasted for 20 minutes each. A short video was shown during the first session to show them what cup stacking is. Then, they received progressive lessons, showing them how to do the actual cup stacking skills. This involved up stacking and down stacking a set of twelve cups in a predetermined way. They started with the 3-stack, the 6-stack, the 1-10-1 and finally the cycle. All students had mastered all of the skills, including the cycle, by the end of the study.

RESULTS



Scores for the experimental group are listed in numbers 1-12; the control group 14-25.

The results indicated that using the cup stacking activity to increase reading scores had a significant effect. The mean scores for the experimental and the control group are shown below. You can see that the experimental group went up from 4.26 to 4.38. This increase of .12 points is equivalent to approximately one month's growth. This indicates that those students' average went up from fourth grade, second month, to fourth grade, third month. The control group, however, basically stayed the same, decreasing a miniscule .03



After the scores for both groups were compared, it was found that the range for the experimental group on the pretest was 5.1 and for the control group, 5.1. On the posttest, the range was 5.7 for the experimental group and 2.4 for the control group. Other scores are listed in the chart below.

	EXPERIMENTAL GROUP		CONTROL GROUP	
MEASURE	PRETEST	POSTTEST	PRETEST	POSTTEST
Mode	4.8	4.7	N/A	2.6
Standard Deviation	1.3	1.3	1.4	.8
Median	4.5	4.5	4.5	4.0

DISCUSSION

The results of this study support the original hypothesis: Sixth grade students who participate in cup stacking activities will have higher scores on the STAR Reading Test than those students who do not participate in the cup stacking activities. The increase was .12 higher than the pretest score. This score can be regarded as significant because any increase in achievement, especially for struggling readers, can be considered a success. It has been my experience from past reading classes that I've taught that students generally show a decrease on the STAR Test during the months of March and April, when the study was done, due to burnout. Maguire (2001) states that educators should use brain-based movement activities in the classroom to access parts of the brain that may be inaccessible to them through other teaching methods. It can be used to enhance, rather than replace other programs or curricula. Also, I

informally observed that the students who used the cups were highly motivated to exhibit success and enjoyed this activity.

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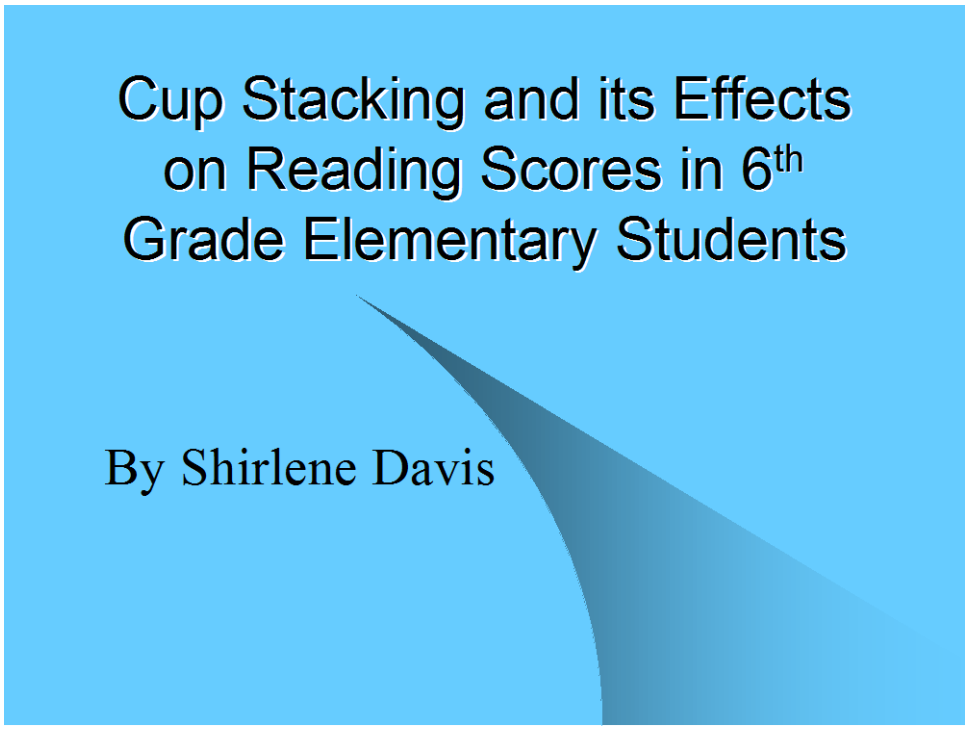

PowerPoint Presentation

**Note: The students presented on the slides are sixth graders from my reading class, and are not the same students who were involved in the study.