



**CALIFORNIA STATE SCIENCE FAIR  
2003 PROJECT SUMMARY**

<b>Name(s)</b> <b>Stephanie A. Williams</b>	<b>Project Number</b> <b>S0323</b>
<b>Project Title</b> <b>The Effects of Positive and Negative Space Reversal on Visual Perception in Children with and without Dyslexia Phase III</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The Purpose of this study was to determine if children between the ages of nine and twelve with dyslexia are able to read and understand with more accuracy passages presented when the positive and negative space is reversed (black background with white letters). It was hypothesized that the reading accuracy and comprehension of the dyslexic students would be improved with this reversal of positive and negative space.</p> <p><b>Methods/Materials</b> A test was created consisting of four paragraphs (two presented normally and two reversed) and two reading comprehension questions per passage. A total of 37 dyslexic students and 34 non-dyslexic students were tested. The students were given 90 seconds to read each passage, the reading comprehension questions were given and answered orally.</p> <p><b>Results</b> It was found that the dyslexic students made less errors when reading the passages presented on the black background. The reading comprehension of the dyslexic students was slightly improved by the reversal of the positive and negative space. The reversal of the positive and negative space had no effect on the dyslexic students reading accuracy or comprehension. A chi-square test was completed comparing the the black and white background reading accuracy for the dyslexic students. This test yielded a P-value of 3.46E-20 (a highly significant value). In addition, a Comparison of Two Means test was completed comparing the background color, this also yielded significant results. Finally a 99% Confidence Interval was established, from which it was be said with a 99% confidence that the mean reading errors of the dyslexic students will be 1.65 less when reading reversed passages.</p> <p><b>Conclusions/Discussion</b> Since both the reading accuracy and comprehension of the dyslexic students improved with the reversal of positive and negative space. Thus, it can be concluded that it is beneficial for dyslexic students to read passages presented when the positive and negative space is reversed.</p>	
<b>Summary Statement</b> The purpose of this study was to determine if the reversal of positive and negative space in paragraphs increases the reading accuracy and comprehension of dyslexic students.	
<b>Help Received</b> Mr. Steely helped edit my report, as did my mother.	