



**CALIFORNIA STATE SCIENCE FAIR  
2003 PROJECT SUMMARY**

<b>Name(s)</b> <b>Tierney R. Burke</b>	<b>Project Number</b> <b>J0307</b>
<b>Project Title</b> <b>An Early Screen for Autism: Detection by Measurement of Differences in Visual-Spatial Orienting</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> Autism is a complex neurological disorder that has increased dramatically in incidence over the past 30 years. Genetics and environmental factors play a role in causing the condition. This project was designed to evaluate a "general screen" that would focus on detecting early indicators of autism related to vision dysfunction. These characteristics include abnormal eye contact, unusual visual interests, empty gaze, and abnormalities in orientation to visual stimuli.</p> <p><b>Methods/Materials</b> The study uses a 3-light display (a central green light, and two lateral red lights) which activate with switches. Participants (ranging in age from two to eleven) were monitored for their visual reactions to the flashing lights. The "first part" of the test looked at the eye focus when a central, green light is turned on to prompt their attention, followed by the activation of a lateral red light while the green light turns off. The "second part" of the test looked at the eye focus when a central, green light is turned on, and stays on, when the lateral red light turns on.</p> <p><b>Results</b> Both "typical" children and autistic children were able to change their gaze in the "first part" of the test when the first, central light is turned off as the second red light stimulus is turned on. The "second part" of the test found children with autism had difficulty disengaging from the first light and shifting to the second light when the first light stayed on.</p> <p><b>Conclusions/Discussion</b> Abnormalities in visual-spatial orienting were detected in autistic children with the simple, visual screen. The hypothesis was supported in the population tested. Children with autism showed evidence of selectively responding to only a small part of the stimulus array presented. Since this screen does not require language, it could potentially be applied to infants. The next step to investigate would be to test children in the age range from 6 months to 24 months. If the screen could be applied to this age group, earlier detection and intervention could be initiated to improve outcome for autistic patients. For further analysis, evaluation against IQ scores, and other neurological disorders would be needed to determine the sensitivity and specificity of the screen.</p>	
<b>Summary Statement</b> A "general" population screen studying visual response to light stimuli can be used to detect dysfunction of eye movement in young, autistic children.	
<b>Help Received</b> My uncles, Robert Blake and Richard Blake assisted in the construction and wiring of the light display test assembly used in testing. My uncle, Thomas Blake instructed me on the use of the graphing program, Statistica, to create the 3-D graphs.	