

UC San Diego Team Shows Correcting Poor Vision Can Help a Preschooler's Performance

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By Leslie Franz

Preschoolers with poor vision have lower scores in developmental testing indicative of success in school performance, but those scores improve significantly within six weeks when the children are given prescription glasses, according to a new study by the University of California, San Diego School of Medicine. The study appears in the February issue of *Archives of Ophthalmology*.



When preschool children are diagnosed with vision problems, prescription glasses can significantly improve their performance on standard tests, UCSD researchers have shown.

This study, directed by Stuart I. Brown, chair of Ophthalmology and director of the Shiley Eye Center at UC San Diego, followed 70 children ages 3-5 identified through the Shiley Eye Center's mobile eye clinic, which serves low-income children who attend Head Start or San Diego Unified School district preschool programs. The service screens young children for vision problems and provides follow up services and prescription glasses for those diagnosed with vision impairment.

"It has been theorized that when young children have early vision problems that are undiagnosed and uncorrected, their development and performance in school are impacted," said Brown. "This study shows that children with vision impairment do perform below the norm in visual-motor coordination tests, and that they catch up quickly once they are given corrective lessons. This underscores the value of our County-wide program for screening and treating eye abnormalities in young children to ensure they have every opportunity to do well as they mature."

"Amazingly, this is the first controlled study of preschool children to show the cognitive disadvantage preschool children have when they are far sighted and/or have astigmatism, as well as to show the benefit of early intervention with glasses," said study co-author Barbara Brody, M.P.H., director of the Center for Community Ophthalmology at the UC San Diego Shiley Eye Center, and clinical professor in the Departments of Ophthalmology and Community and Preventive Medicine.

Of the children who participated in the study, 35 had normal vision and 35 were diagnosed with ametropia -- abnormal refractive eye conditions leading to poor vision, such as astigmatism. Before glasses were prescribed, all of the children took two standardized tests: the Beery-Buktenica Developmental Test of Visual-Motor Integration (VMI) and the Wechsler Preschool and Primary Scale of Intelligence-Revised (WPPSI-R). These tests relate directly to future school performance.

The vision-impaired children scored significantly lower on both tests, compared with the children with normal sight, with the results demonstrating reduced ability of the brain to coordinate the eyes with the hands.

The vision impaired children were then provided with prescription glasses and monitored with the assistance of their families over six weeks to ensure that they wore their glasses consistently. All children were

re-assessed using the same tests after six weeks.

The most dramatic improvement was in the VMI scores of the children who had been diagnosed with vision problems, which were at the same level as the scores of the children with normal eyesight after six-weeks with corrective lenses. The WPPSI-R scores did not show the same dramatic improvement, but the researchers speculate that the test might not be as sensitive to changes in visual-motor integration skills tested by the VMI tool. They are following the children to test whether the WPPSI-R scores change further over time.

Since low visual-motor skill scores correlate with lower academic achievements, the research team speculates that improved skills due to corrected vision might lead to improved cognitive and verbal performance.

"These results from this relatively small sample of low-income preschoolers with ametropia suggested that early identification and correction should optimize cognitive development and learning, at least in the studied sample," the researchers conclude.

Co-authors of the study are Anne-Catherine Roch-Levecq, Ph.D. of the UC San Diego Department of Ophthalmology, and Ronald Thomas, Ph.D., of the Department of Neurosciences and the Department of Family and Preventive Medicine.

The study was funded in part by the Foster Fellowship in Vision and Development and Research to Prevent Blindness.

Background:

"Save our Children's Sight" is a program of the Division of Community Ophthalmology, in conjunction with the Anne F. & Abraham Ratner Children's Eye Center, at the UC San Diego Shiley Eye Center, Department of Ophthalmology. The program is dedicated to addressing the access barriers to vision care faced by underserved young children and their families. Its mission is giving low-income children ages 2-6 the vision they need to succeed in school and in life by identifying, treating and preventing vision disorders by means of vision screening, outreach and education, and early child development research. The program EyeMobile for Children offers vision screening of low-income young children in over 190 locations throughout San Diego County. The mobile pediatric clinic on the EyeMobile examines all children who fail the vision screening. This service provides glasses and/or referrals to specialists at no cost to their families.

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