

## Commentary

*Robert Lingua, M.D., Bascom Palmer Eye Institute, Miami, Fla, comments:* Strabismus is the most common eye operation performed in children and the second most common diagnosis leading to eye surgery in the United States, according to the statistics published in *Vision Problems in the U.S. Facts and Figures* by Research to Prevent Blindness, Inc., 1980. The goal of such surgery remains the attainment of as near perfect an ocular alignment as possible in order to optimize the ability of the visual cortex of a child to integrate the images coming from both eyes into a single projection and appreciate the best possible vision, which involves much more than visual acuity alone. The rationale for surgical intervention in children with strabismus is rooted in the potential for achieving an improved visual state, in the hope that a forced alignment will result in a central integration of both images.

Thanks to the pioneering work of Drs. David H. Hubel, Roger W. Sperry, and Torsten N. Wiesel, who were honored with a Nobel prize in physiology and medicine, a greater understanding of the developmental neurophysiology of the visual system is gradually making its way into the clinical care of children with visual abnormalities. That there are specific deadlines, if you will, for the development of central cortical pathways that subserve the finer visual function is well accepted. Until that work had stimulated further clinical research, our only measures of visual performance in childhood included visual acuity and stereopsis, or depth perception tests. These two tests alone, however, are simple measures of complex processes for which there are many individual components, and most probably, corresponding neuronal pathways.

The authors have presented a new clinical probe to investigate the existence of binocular

cooperation that is not linked to the clinical assessment of a sophisticated visual function, stereopsis. The clinical significance of this work derives from its potential to allow us to further discriminate among strabismus populations by a characterization of their central binocular potential. The authors have presented a lucid argument for employing the motion aftereffect as a measure of cortical binocular integration, which is thought to occur at a different neuronal level than that which mediates performance on tests of binocularity, which are presently available to us.

Will the motion aftereffect allow us to characterize that minimal amount of misalignment that can be an "acceptable" result in strabismus surgery and therefore on a physiologic basis provide an endpoint for this procedure? Perhaps a better understanding through assessment of the motion aftereffect at various age levels will allow us to improve our timing for surgical intervention such that prognosticating the sensory results in the older infant would be feasible. Additionally, further insight as to the minimal anatomic requirement for vergence movements may help us understand why some patients are able to maintain alignment in the presence of small degrees of disparity while others are not and alignment deteriorates into larger angles of strabismus requiring further surgery. The authors have presented convincing evidence for the presence of binocular integration of visual information at the cortical level in the absence of stereopsis, the classically accepted test for binocular function. We hope that the further work of these authors will lead to an ability to not only further define a subclassification for binocular cooperation, but also provide sensory justification for improved management of strabismus in infancy.