

Visual Model for Children with Neurointegrative Dysfunction

The human organism is a self-organizing system. Self-organizing denotes a process in which the energy of light, sound and pressure merges into spatial patterns across the nervous system. The system organizes a spatial map on the brain. Human response to these energies can be measured and observed as states of awareness, attention and adaptation.

The process is dynamic, seeking a temporal/spatial stability of behavior. When the stimulating energies overload in the processing system, instability can occur. This instability can give rise to a complicated spatial/temporal behavior pattern. A specific form of instability can be found in autistic-spectrum disorder.

The dynamic behavior of the autistic system is often difficult to understand. In particular, certain visual behavior patterns appear prevalent among autistic individuals:

1. Inability to make eye contact.
2. Viewing the world from the side rather than directly.
3. Constant running and exploring new environments before coming to rest;
4. A visual preference for disorganization rather than organization;
5. Attention division either to self or space, but inability to focus on both simultaneously; and
6. Attention to one sensory system over integration and attention to multi-sensory systems.

In comparing the characteristics of dynamic visual behavior of the autistic individual to individuals who suffer from other dysfunctions such as attention deficit disorder, dyslexia, and psychological dysfunction, we can find similar dysfunctional dynamic visual behavior. The study of visual behavior differentiates these groups by level of dysfunction, and by complexities of the individual's ability to interact with his or her environment.

Conventional visual testing lacks the ability to correlate vision and behavior and, therefore, is unable to identify autistic individuals. Thus the need for novel testing for autistic individuals arises. Novel testing entails a factual inquiry into the

problem of adaptation to visual transformation. This form of testing is based on the concept that the neural transformation of light is far more important than transformation of the optical image. Understanding the basic phenomena of awareness, attention and adaptation as they relate to perception, movement and learning results from this type of testing. Let us define awareness, attention and adaptation in the following manner:

Awareness: Physical display of heightened perception

Attention: Individual selective application of energy to the environment through the senses

Adaptation: Natural response of the organism to existing conditions in the environment; includes changes in awareness and attention. An adaptation is a transient change in perceptual competency that serves to reduce or eliminate discrepancies between or within sensory stems or the errors in behavior induced by these discrepancies. Adaptation is consolidation, a coming to rest between a person and his environment at a particular moment in time.

The method of testing should focus on the characteristics of the dynamic behavior exhibited by the autistic individual. In describing and measuring the adaptation phenomena among autistic individuals, one must be aware of the limited verbal descriptions available and focus on their overt actions. Overt actions can reveal distinct levels of performance, ranging from awareness to attention and finally adaptation. (The level of adaptation varies in completeness of performance, but each individual adaptation occurs when the individual achieves balance in his or her interaction with the testing environment.)

In my practice, we have used tests which include visual tasks in isolation, integrated visual tasks, organized spatial tasks and disorganized spatial tasks. We have found that using prism lenses and comparing the patient's performance with and without such lenses can be very revealing. In particular, we study the following:

1. Compare the difference between looking with and without the lenses (e.g. frontal view, side view);
2. Compare the differences between actions with and without the lenses (e.g. postural shifts);
3. Compare the differences when looking and orienting to gravity with and without the lenses (e.g. attention to looking or orienting to or both); and
4. Compare the differences between dissociated field of view and an associated field of view (e.g. visual performance).

Interpretation of the visual analysis requires both art and science. Familiarity with the ways in which lenses modify the perceptual field is a science. However, interpretation of the dynamic behavioral changes to the altered sensory environment is an art. By observing the patient's positive adaptations to the characteristics of the special lenses, we can then prescribe according to the needs of the autistic individual to direct his or her eyes, head, and body competently under visual guidance.

Rehabilitation is a dynamic process that requires raising the level of adaptive interaction of the complex autistic system with its environment. It is necessary to employ perceptual rearrangements to re-orient or disorient the visual system. Rearrangement leads to perceptual stability through stages of awareness, attention and adaptation. Reorienting the individual's ability to process information from light, sound and pressure can result in higher level of adaptation. As the individual expends less energy adapting to the stimuli in his environment, he can devote more energy to learning, speaking and other actions.

Turning the tide in autism requires treating the person as a whole, rather than isolating his information processing system. The different senses compete for attention of the autistic individual. Evaluating the autistic individual's visual attention and adaptation will necessitate taking account of the level of mismatch among his sensory modalities. Other factors

Continued on page 26

Visual Model - *Continued*

that affect the individual's visual performance include the intrinsic novelty of the task being performed, his or her current internal model of perception, and most assuredly survival is the coming to balance either one's environment, neural system, change.

I have used these methods with over three hundred patients who have displayed the label autistic spectrum disorders. They range in age from 2 to 35 years. These patients have resided in Germany, England, Israel, Canada, Mexico, Hong Kong and the continental United States.

We are presently collaborating on a study at the Canadian Institute for Neurointegrative Development (GIant Steps) to demonstrate the efficacy of this visual model for integrative development.

Melvin Kaplan, OD
Tarrytown, NY

The Center For Visual Management

Melvin Kaplan, O.D.

150 White Plains Road
Suite 410
Tarrytown, NY 10591

Telephone 914-631-1070
Fax 914-631-1004