Petition for An Additional Vision Milestone

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Abstract

Climbing up a sheer, vertical rock wall epitomizes managing one's field of view. Climbers search the wall's jagged surface, holding steady as their eyes make the smooth pursuit movements of searching. Each climber interrupts these smooth pursuits with sudden jerks of vision, saccades, to zoom in on, to fixate and hold gaze on an anticipated grasping point.

In this way each focuses maximum acuity, foveal vision, in anticipation of making contact; while estimating vision, parafoveal vision, continues to monitor balance and be an alerting mechanism to redirect foveal vision to the next safe hold.

A means of assessing said interplay between foveal and parafoveal vision is introduced. The proposed milestone is linking complementary visual events, a visual scene milestone, 3-5 years. (Samples of complementary visual events: hand rotation upwards so that the palm is ready to catch potato chips as they fall from a tilting dispenser, racers aligned at the "set " blocks leaning forward in anticipation of the fastest response to "go"....)

Reading requires precision in the interplay between foveal and parafoveal acuities; parafoveal vision having a precise role.

Students with disability based learning plans benefit from a collaborative team which may include classroom teachers; reading teachers; education specialists - vision, speech and language, psychologists; occupational and physical therapists, family. The visual challenges of the linchpin of academic skills, reading, also invites education teams to consider vision issues for students who do not demonstrate a vision disability.

Advocacy for an additional vision milestone derives from vision issues raised in team deliberations on how to assist student's accommodation to reading, to its changes in the field of view experienced in the rapid transition between "learning to see" by play and experimentation and "seeing to read" within the compressed dimensions of a line of print.

Petition

Give and take between parafoveal and foveal dominance of perception is determined by how the observer, the data collector, wants to act on the scene. If the observer's view is without a central focus - is large as when eyeing a Ferris wheel at an amusement park - parafoveal acuity will dominate and be sufficient to discriminate legs dangling from the wheel's buckets to know if there are riders in those seats. If the observer's view has a center to it the observer can hold a fixation, advantage is to foveal vision as in studying a cresent moon to determine which encroaching object is Venus and which is Jupiter.

In learning to visualize complementing actions, preschoolers play at:

aligning manipulations: anatomy for preschoolers - donning a skeleton costume with visual attention on its multiple alignments of the thick and thin bones - narrower at pelvis then at shoulder where the largest bones sit like an upside down layer cake - all attaching to a cord that makes the ensemble be us; this is a Copernican change from the 12 to 16

month milestone of concentrated fixation in tasks such as stacking rings of diminishing inner and outer circumferences on a correspondingly tapered post;

transposing manipulations: discovering entrance and exit ways to a tunnel and using this passageway to move and hide treasures in opposed locations, tic-tac-toe or seeing the possibility of three of a kind in a row;
reflexive manipulations: over-under-through-and-around perspectives of moving through obstacle courses - the views of form constancy which teach the invariance of absolute shape, a ninety degree corner is recognized as a square no matter if its big or small, up side down or right side up; the stretch of "magic face" springs distorting facial features and returning them to recognition, pulling a coiled snake straight, playing with "transformer" toys, playing on folding chairs ...;
extending manipulations: repeating the micro extensions between two dominoes in an uninterrupted extension of their line as far as the playing surface allows, chaining cars between engine and caboose ;
substitution manipulations: playing in the tub where a bar of soap can switch for a boat because it floats, Fred Flintstone's wheels can be rock cylinders because they roll like circle wheels do...;
mixing proportions: estimating how much chocolate syrup the full glass of milk needs to taste just right - a range of proportions may please; and matching to something known as in letter identification - the single position the letter g occupies in the alphabet, nine letters closer to the letter a than its look alike q.
These distributions set the stage to freely associate elements throughout the visual field and provide freedom to associate elements that have no direct contextual or physical link to one another. These visual associations are one basis of what renown professor of animal science Temple Grandin writes of as "thinking by making visual associations." Dr. Grandin writes:
I have no language-based thoughts at all. My thoughts are in pictures. When I recall something from memory I see only pictures. I used to think everybody thought this way until I started talking to people on how they thought. I learned there is a whole continuum of thinking styles, from totally visual thinkers like me, to totally verbal thinkers....[1]
Dr.Grandin has autism.

In 1984 I interviewed two colleagues, Marilyn De Witt, Director of the Center for Literacy in West Philadelphia, and Helen Simyiak, remedial reading specialist and author of R.S.V.P.: Reading and Spelling Via Phonics subtitled Remedial Reading and Spelling: A Program for Teenagers and Adults. I was preparing a book on the role of vision in learning for a different purpose, independent orientation in space for the visually impaired, and sought guidance in examining issues of the hidden effects of prior learning on acquiring new skills such as reading.

Marilyn, it is my understanding that people who come to the Center for help typify the following characteristics. They are post highschool in age and average or above average in intelligence; they are motivated... Throughout their lives they have been frustrated when trying to learn to read, experiencing failure often enough that using the term "chronic" reading difficulty is appropriate.
Marilyn De Witt: ... This is true of the clientele we work with here...By the time they come to us the chronic nature of their reading difficulty has interfered with their ability to seek help. They've developed a whole series of ways to fake it and admitting they've got a problem is very difficult the longer they put it off. So the more chronic it is the more difficult it is for us to work with the client....
Yes, it is true it's a rare person we deal with that is a chronic non-reader, or experiencing reading difficulties, who is not average or above or above average intelligence...
Helen, please comment on the general level of the students you have and continue to work with.
Helen Simyiak: Brilliant. Some of the students are brilliant, particularly in mathematics. I have had students who were superior in math, but who could not read the simplest sentence. I can't tell why a student behaves this way. You'll meet another student who is disabled in both areas...
The type of student that I work with is the remedial student. The student who has not been able to learn with the methods available to him in the public school from the time he started. At present, I'm working with adults who still cannot make the type of associations basic to reading.
Marilyn, please comment on the predisposition of the Center's clientele towards behaviors and activities that shape a preference for selected types of perceptual reinforcement. Do you find that the solidification of such preferences makes for a core block of habits in directing attention, in learning to sequence responses which is very difficult to break through and restructure for the purpose of teaching reading skills.

Marilyn De Witt: That's definitely true. One of the biggest barriers to teaching reading (and we do it by phonics and word families for the most part) is that a person will rely on the shape of the word and will not, just will not, submit to recognizing a sound-symbol relationship..

Since the 1970's the connection between vision and learning has been phrased as the connection between "eyesight" which is the measurement of vision in a clinician's office, 20/20 acuity, etc.; and "learning to see" which is how we must move our eyes and fixate in order to select out useful data from a scene. Optometric "Intervention Strategies for Helping Children Overcome Deficits in Reading, Learning, and Comprehension" popularize a synergy between purposeful - voluntary - perceptual attention and oculomotor control.

Recently I received an unusual type of invitation for a teacher of the visually impaired: to become a consulting member to the IEP (Individual Education Plan) teams for a number of non-visually impaired students. Their eyesight profiles were highly similar: each student having normal visual acuity, each student demonstrated a slight misalignment of the eyes during a cover test, each demonstrated an odd scattering of visual-perceptual skills on the Test of Visual-Perceptual Skills and associated perception measurements. Each being described by team members as a good classroom participant and the adjective "creative" was often used. Referring teams were composed of special education teachers, reading specialists, classroom teachers, occupational therapists, school psychologists, and family members; each team voiced complete frustration with their inability to help these students make progress learning to read.

These teams asked me review the TVPS scores that were part of a recommendation for optometric training that accompanied the eye exam report, and advise them if the recommended regime of "Intervention Strategies" would be helpful. In other words, "Does this child lack the voluntary eye control to succeed at reading and is this the stumbling block to our efforts to teach reading skills to this youngster?"

When attempting to negotiate the visual differences between the bottom-to-top perceptual learning of childhood where ninety degree corners are invariably a square, and the exclusively top-to-bottom perceptual demands of reading, our 180 degree visual world needs to become reflexive enough to accommodate full perceptual attention to a single, narrow line of print from which the observer must pass all visual data through a filter of prior academic learning. This filter puts the absolute, singular shape/form constancy of 3D space Center for Literacy students cling steadfastly to on one side, and the context based word options that may fit into a shape/form on the filter's opposite side.

To mitigate interference from prior learning in measuring vision skills maximum effort should be made to exclude all forms of academic learning in the means of assessment. The observer should be able to demonstrate mastery of voluntary eye control on scenes of any size, and apply precise or relative visual discrimination to those scenes based upon age appropriate general knowledge. Therefore, a reading book would not be a good assessment tool for measuring voluntary ocular motor control because it also requires sound/symbol decoding skills.

An assessment tool for measuring voluntary ocular motor control should present visual data that has a high degree of freedom in its display: freedom of orientation - unlike the rigid orientation requirements of print, general knowledge visual data is recognizable from multiple viewpoints; freedom of spacing - unlike the uses of spacing in academic tasks, natural groupings are randomized and occur in response to local conditions such as eddies of water in a stream; freedom of size - varying size elements can cluster in dense or sparse groupings, there is no systematic ordinal arrangement by size; freedom to reduce or simplify - visual data can be robust or minimal so long as key invariant bits retain their relationship to one another.

The visual data I use for milestone assessment are "footprints" of animals living in a pond habitat. Footprints are visual data to which all of the above criteria [freedom of orientation, freedom of spacing, freedom of size, freedom to simplify...] may be applied and their water habitat scene presents for children three years and older. A duck's webbed feet distinctly identify this bird in whatever orientation they are seen. Its beak, eyes, tail feathers, and wings immediately associate with these prints. They are distinct from the footprints of the long-tailed bird, the frog, the river otter that also

populate the pond. Each print is identifiable at speed; each associates with a body form and pond locations at speed. Unlike letters in a word, each retains its individuality so that a string of prints represents a group of birds once present in the space the footprints now appear in. It is based on

visual associations, not academic associations. Modeling of these ideas is illustrated on the website **www.visionscreening.info**

If a learner can demonstrate the milestone of linking complementary visual events with age appropriate visual discrimination vision is not an inhibiting factor to learning.

Without separation of vision from prior knowledge optometric exercises may also have pitfalls for many subscribers who have excellent functional vision to begin with.

Of equal weight in this petition is the situation of inbalance in the give and take of foveal and parafoveal visions. For a variety of circumstances the balance needed between foveal and parafoveal vision to successfully turn visual data into actions will be biased, most often in favor of near vision. This may be thought of to have the same limiting effects on visual proficiency that eye muscle imbalances effecting the alignment or teaming of both eyes result in - diminished depth perception and other effects.

Reference

[1] Temple Grandin, "Thinking the Way Animals Do" Western Horseman (November 1997) 140-145.