

Jonathan Bailin, Ph.D.
Exercise Physiology/Biomechanics/Ergonomics
Sports Medicine & Ergonomics Inc.

11848 Atlantic Avenue
Los Angeles, CA 90066
310/390-8309 e-mail: rsi@usc.edu

Ms. Cathy Lamberti,
President Sportwall International, Inc.
Santa Barbara, CA 93013

Dear Ms. Lamberti:

Dr. Gary Polan, Optometrist and Sports Vision specialist, and I have examined the computerized Sportwall. In our opinion it warrants applied research toward defining its potential benefits to the visual skills of its users. Most importantly we feel confident that the Sportwall will yield significant improvement in areas of learning beyond sports and physical education.

The list of school offered sports in which we predict Sportwall will show its impact include baseball, basketball, football, racquet sports, soccer, volleyball, handball, tetherball, t-ball, kickball, 4-square, as well as others. In addition, we feel that the visual/motor skills impacted by Sportwall will carry a global influence on a child's self esteem because of increased abilities in learned eye skills necessary for many forms of intellectual effort.

Few realize that reading is a motor activity! We are excited at the prospect of documenting Sportwall's potential influence on intellectual skills, which overlap those of motor activity, such as those described below.

Dr. Polan has operated a private optometric practice for twelve years at 881 Alma Real Drive Suite T4 in Pacific Palisades, California 90272. He helped pioneer the field of Sports Vision in 1984 (*). Finally, in 1996 year his work received corroboration by the staff at the Jules Stein Eye Institute (**).

His experience in the training and improvement of visual skills has resulted in "surprising" advances in most learning disabled cases. Improvements in intellectual activity which are generally unexpected, but very welcomed by parents, have not been well documented by rigorous research designs to date. Still, we are confident that Sportwall will play a significant role in improving reading skills, Attention Deficit Disorder (ADD), and Dyslexia as describe later.

* Hoflinan, L., Polan, G., Powell, J. The relationship of contrast sensitivity functions to sports vision" Journal of the American Ootometric Association 55:10,747-752, Oct 1984.

** Laby, Rosenbaum, Kirschen, Davidson, Rosenbaum, Strasser, Mellman "the visual Function of professional baseball players" American Journal of Qpthalmology 122:4,476-485. Oct. 1996.

Introduction to Visual Skills

Readers of this proposal should realize that ALL visual skills are learned. Thus a rigorous study of the effects of the Sportwall's interactive nature should be performed to elucidate its specific benefits as a visual/motor learning tool.

Visual skills can be divided into 3 sub areas: Visual Acuity, Visual Efficacy, and Visual Processing. Visual Acuity is measured by standard optometric tests commonly used for eye prescriptions including standard eye chart examinations.

Visual Efficacy can be measured by testing in the 24 areas listed below which include focusing, convergence, divergence, etc. Visual Processing can be evaluated by tests which measure the extent of learning disabilities such as Reading Disorders, Attention Deficit Disorder (ADD), and Dyslexia as found in items 2, 7, 15, 16, 18, 20, 21,22, and 24. Most ADD and Dyslexia is responsive to treatments for visual/perceptual deficiencies in these areas of training thus often diminished or alleviated completely.

Though no device or learning system can be expected to improve all areas of the visual skills listed below, we are confident that the computerized Sportwall will show potential benefits to its users in more than a few of the areas listed here. The particulars of our proposed research follow this list.

Visual Efficiency Skills

All movement mechanics during sports are enhanced by eye skills and eye health. In turn, improvements in several areas of eye skills will enhance eye performance during motor activity. For example, reaction time is first dependent on visual accuracy and recognition skills listed. To acquaint the reader with the proposed research, a brief review of each eye skill which can positively effect motor performance must be considered. Please note that Visual Efficiency Skills are a subset of all the eye skills listed below.

Each skill is rated from 0-10. Ten represents our highest confidence of finding improvement due to Sportwall practice. For example, a rating of "4-6" means that we are moderately confident that practice on the Sportwall will show documented improvement. A rating of "0-1" means that Sportwall should show little if any improvement. The reader is cautioned that these are only educated "guesstimates" which await documented findings.

1) Visual Acuity—your ability to achieve a sharp resolution of an image can be divided into static acuity (stationary images) and dynamic acuity (resolution of images in motion).

a) Static Visual Acuity—Corrected or not, your eyes should have 20/15 vision for high speed activities. "20/15" vision means that is you see at 20 feet what the average person only sees accurately at 15 feet away. [0-1]

b) Dynamic Visual Acuity—the ability to see sharply while the player, opponent, and ball are all in motion. This ability is made up of many other skills such as Convergence, Focusing, Tracking, and Interpretation, etc. Following the action with the eyes rather than the head or body is more efficient and puts less stress on the balance and muscular-nervous system. [4-6]

2) Visualization—is the ability to plan, imagine, and prepare for upcoming motor skills and movements. Some sports scientists believe visualization of needed skills is more efficient than coaching "pep talks". [4-6 with certain activities]

3) Peripheral Vision—is critical to awareness of other important things while watching the ball such as your teammates, boundaries, or opponents. [2-4]

4) Depth Perception—is the ability to quickly and accurately judge the distance between yourself and your opponent, teammates, targets, and boundary lines while judging the speed, rotation, and flight path of the ball. [4-6]

Billy J King rates this above court speed and eye-hand coordination for junior tennis players. Quickly diminished by those who stare during the day—students, programmers, and executives may play poorer tennis during the week than week end for this reason.

5) Visual Pursuit—is the ability to use the eyes to follow a moving object smoothly and accurately. This critical skill is based on good eye teaming and eye muscle balance but it cannot track a ball smoothly at high speeds where Saccadic Movement takes over. [8-10]

6) Saccadic Movement—is the ability of the eyes to "jump" from one point to another when speeds exceed those of visual pursuit. This skill is used in reading to jump from one word to the next. If this skill is poor, reading ability is affected!

Quick, accurate saccades are used to survey rapidly with as little head movement as necessary. Head movement is a less efficient method of eye tracking and can confuse balance. Unnecessary head movements and eyelid reflexes to flinch must overcome with training. [8-10]

7) Visual Concentration—describes the cooperation between Visual Pursuit, Saccadic Movement, and Visualization in the "mind's eye" or imagination. This skill is not scientifically well defined yet, but is exemplified by tennis players who must switch concentration rapidly from target, to ball, to processes of planning and prediction which are critical to performance. [7-9]

8) Speed Of Focusing—is the ability to shift focus from near, intermediate, and far distance. This eye muscle skill is subject to the same fatigue which affects other muscles over the course of exercise. [5-7]

9) Glare Recovery Speed—is the ability to see clearly after looking toward intense light. Focusing near sun and at tennis court lights causes "dazzle" to the retina. [5-7]

10) Sight in dim illumination. [5-8]

11) Eye Muscle Stamina—is the ability to withstand fatigue without decreased performance in a variety of eye tasks. [6-8]

12) Color Perception—is not critical but may play a role in yellow against white line calls. [0-1]

13) Eye Dominance—is the ability of the sight in one eye to dominate images from the other. Tennis players generally prefer strokes on the same side as the dominant eye which is usually the right for right handers over 80% of the time. [8-10 with manipulation]

14) Fixation Ability—is the skill of preventing eye fatigue which comes from staring at objects too long. Receivers with poor fixation skills fatigue within a few seconds of staring at the server. Other players do not, but staring should be avoided. [5-7]

15) Visual Memory—is the accumulation of past experiences such as the number of proper swings logged in a player's "motor program file". This combined with visualization for future swings is probably a major factor in consistency during competition. Visual memory fades with time. [5-7]

16) Spatial Localization—Knowing your position relative to other objects especially while you, ball, and opponent are moving. [4-6]

Esophoria—players who see the world CLOSER than reality, tend to hit/throw shorter.
Exophoria—player who see the world FARTHER than reality, tend to hit/throw longer.

17) Speed of Recognition Time—is how fast can you identify images. [7-9] 17b) How fast can you react to those images

18) Eyes to Body Coordination—is the ability to integrate what you see into an appropriate and coordinated response from your body parts (aka: Visual/Motor Integration). [8-10]

19) Contrast Sensitivity—the ability to pick out an important object against a field of other objects. [5-7]

20) Visual Attention-is the skill used to prepare the eyes and brain which heightens its readiness for an upcoming task. This is a precursor to Visual/Motor Organization. [5-7)

21) Figure/Ground-is the ability to pick out an object in the foreground against a variety of background fields; to discriminate the figure to be attended to and to see the interrelationships to its background information. (4-8)

22) Visual/Motor Organization-is the ordering and organization of motor skills; to choose from a "catalog" of motor programs for meaningful and productive action. (5-7)

23) Jump Duction-the ability to move from visual tasks that require convergence to divergence of the eyes and back. Jump Duction deals with vergence; the activity of the extraocular muscles to diverge for distance, and converge for near objects rapidly and efficiently. (5-7)

24) Auditory/Tachistoscopic Skills— are those which help sound and sight skills complement each other during visual processing. It is the auditory/visual integration ability of an individual which coordinates inputs into a meaningful perception and to shift priority and attention from one to the other when necessary.

Auditory specialists can better assess the ability to discern background from foreground sounds similar to the way we will assess background to foreground objects. This is an area worthy of much more study. There is much potential to design audio triggers, cues, and scoring tones for future Sportwall games here. [6-9]

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