Dyop® Vision Test Basics

Dyop® Vision Associates
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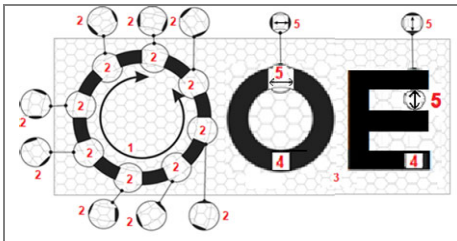
Vision is a dynamic process which enables us to eat rather than be eaten. The vibratory motion of the visual saccades, **inherent in all animals,** refreshes the response of the photoreceptors in the back of the retina much like the pixel scanning lines on an electronic display. That refresh allows the neurons on the inner surface of the retina to act as the equivalent of a biological circuit board, and allows the blue, green, and red photoreceptors to use chromatic triangulation of their focal depths to regulate acuity.

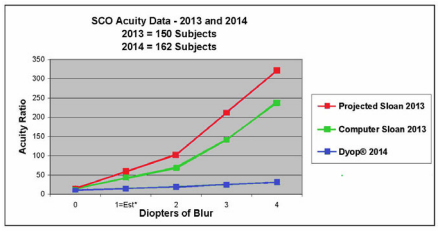
A **Dyop**® (short for dynamic optotype) is a spinning segmented ring with contrasting (typically Black/White) segments and gaps which provide a strobic stimulus to the photoreceptors. **Acuity** is the measurement of visual clarity. The **angular arc width diameter** of a Dyop is used as an indicator and visual target for measuring acuity and refractions. The smallest Dyop angular arc width diameter, where the direction of spin can be detected, is the visual acuity and refraction endpoint. At a Dyop sub-acuity diameter, the direction of spin **cannot** be detected. The vibratory motion of the saccades results in the strobic Dyop segment/gap perception of motion **Resonates** with the refresh rate of the saccades and functions much as the visual equivalent of an audio tuning fork. .

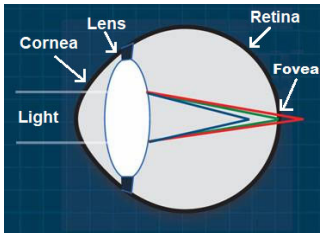


Item 1 – the visual angular movement/velocity for the strobic contrast response (**40 RPM** optimum) with **a 0.33 arc minute squared per second** refresh rate.
Item 2 – the moving segmented **0.54 arc minute squared** Minimum **Area of Resolution (MAR)** for dynamically stimulating a **20 photoreceptor cluster.**
Item 3 – retinal photoreceptor cell clusters
Item 4 – examples of a historic static **Recognition** or **Resolution** acuity optotype
Item 5 – the static **1.0 arc minute squared** Minimum **Area (MAR)** of a **40 retina photoreceptor cluster** for a historic static optotype

Types of Optotypes **Dyop Components**

Historic acuity measurement was based on the concept of **Resolution Acuity** (the ability to detect the separation of two points such as stars) or **Recognition Acuity** (the ability to identify an array of European letters as devised by Dr. Herman Snellen in 1862). However, static optotypes counter the effectiveness of the saccades and deplete the refresh of the photoreceptors. Because a Dyop resonates with the vibrations of the saccades, it creates a much more precise and consistent **Resonance Acuity** concept as the visual equivalent of an audio tuning fork.





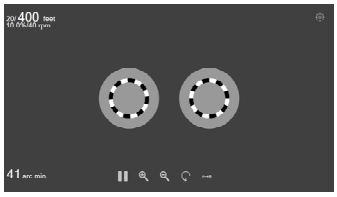
Reduced Dyop® Variance

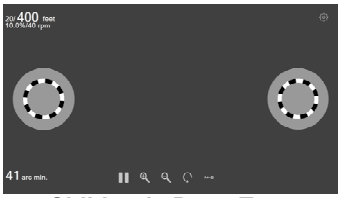
Study Condition	Variance
Projected Sloan Letters (2013)	0.282
Computer Sloan Letters (2013)	0.233
Dyop - Doublet (2014)	0.035

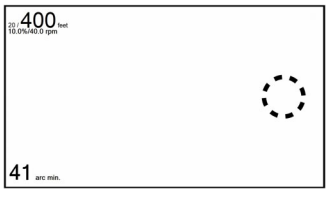
Summary of the variance in the test conditions over the two years of the study.
Acuity Study - Dr. Paul Harris, SCO

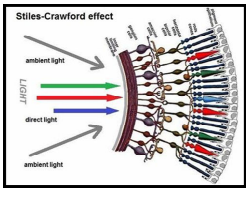
The **Adult Dyop Test** has two identical diameter Dyop rings near the center of the display with **only one ring as spinning.** The **Children's Dyop Test** has two peripheral Dyops with only one ring as spinning. The ring diameters are identical and the visual acuity endpoint is the **angular diameter** of the smallest Dyop ring which was detected as spinning. To detect false positives the subject is asked whether the spinning ring was the left ring or the right ring, or whether that ring was spinning clockwise or counter-clockwise.

The **Infant Dyop Test** has only **ONE** peripheral Black segmented Dyop on a White background which alternates its peripheral location as the Dyop diameter, or spin direction, changes. Because of the preferential tendency for motion detection, the **Infant Test** and the **Children's Test** can both use the motion of the subjects head and/or eyes to track the far right side or the far left side of the monitor as the peripheral location of the spinning Dyop.









Adult Dyop Test **Children's Dyop Test** **Infant Dyop Test** **Photoreceptors**

Using remote access software such as AnyDesk also allows acuity testing to be done successfully regardless of the differences in the computer operating system or distance between the subject and the examiner. Color acuity testing may also be done to detect the potential for symptoms of dyslexia, migraines, or epilepsy.

The net advantage of Dyop acuity is that it has up to six times the precision, up to one-sixth the variance, and potentially twice the efficiency of Snellen testing as to acuity and refraction measurement. A Dyop retains those advantages regardless of the age, culture, or relative literacy of the subject being evaluated. A Dyop can be used to measure acuity in color, and a Dyop can be used for measurement of less developed acuity systems such as that of an infant.