

Glossary

Akinetopsia. A disorder where individuals struggle to perceive moving items.

Age-related macular degeneration (AMD). A predominant reason for vision impairment in individuals over 50, impacting the macula which helps in distinguishing fine details.

Amblyopia, also known as "lazy eye." A visual disorder where one eye functions well while the other doesn't. It emerges when the eyes aren't aligned or synchronize wrongly, leading to double vision. To rectify, the brain disregards one eye, affecting its visual capabilities.

Antagonist eye muscle. The muscle pulling the eye counter to the direction of the agonist muscle. When the agonist contracts, the antagonist relaxes.

Astigmatism. A visual disturbance causing unclear vision because the eye doesn't uniformly focus light on the retina. It's akin to a magnifying lens with inconsistent curvatures causing a blurred image.

Binocular vision. The field of sight when both eyes function collectively.

Bipolar cells. Retinal nerve cells that handle initial visual data processing. They get signals from the rods or cones and relay them to retinal ganglion cells connecting the brain.

Blepharitis. A chronic inflammation affecting the eyelash follicles on the eyelid's rim.

Blindsight. A phenomenon where individuals can perceive objects in their blind visual area without conscious awareness. Despite reporting not seeing anything, their guesses about the object are accurate, indicating a subconscious form of vision.

Cataract. A cloudiness in the eye's lens that obscures vision, creating a misty sight.

Central vision. The sharpest visual area when gazing directly using both eyes, crucial for reading and detailed observation.

Compensation. In the realm of vision rehab, it often means intensifying eye movements toward the blind field to offset the vision loss.

Cones. Specialized retinal nerve cells accountable for color vision.

Cornea. The transparent external layer of the eye that influences focus by bending light in conjunction with the lens.

Cortical magnification factor. A brain-based enhancement mechanism allowing central vision to be sharper than peripheral sight.

Diabetic eye diseases. Eye disorders predominantly in diabetics, like diabetic retinopathy, leading to retinal tissue damage.

Glossary (cont)

Diabetic retinopathy. A diabetes-induced ailment caused by retinal blood vessel damage that can cause progressive blindness.

Dilation. Pupil expansion to let in more light. Dilation, often induced using eyedrops, assists ophthalmologists in examining eyes effectively.

Donders test. A visual examination where a finger is moved in and out of sight.

Dry eye. A state where the eye lacks sufficient moisture due to inadequate tear production or rapid evaporation, possibly due to infrequent blinking.

Enriched visual environment. A boosted visual setting with numerous or intricate visual stimuli. Used in studies to understand the brain's reaction compared to standard or diminished vision.

Extrastriate areas. Brain zones, beyond the primary visual cortex, attuned to motion, color, and perception.

Extrastriate pathway. A swift brain communication route separate from the main visual route, serving as an alert system. It permits the brain to sidestep the slower conscious processing.

Eye yoga. A set of exercises focusing on enhancing eye muscle strength and visual capability, where muscles are systematically worked upon, enhancing strength and elasticity.

Feature detection. The procedure of recognizing and scrutinizing visual elements.

Field of view. The visible realm when eye movements occur, not to be mistaken for the "visual field" which is seen without eye movement.

Fovea. A small indentation in the retina's macula crucial for perceiving color and intricate details.

Ganglion cells, also called retinal ganglion cells. These collect processed signals from bipolar cells and send this data to the brain via long extensions ending in the brain's midsection.

Glaucoma. Diseases risking vision or leading to blindness by harming the optic nerves. It can arise from elevated eye pressure or even with standard pressure, known as "normal tension glaucoma".

Graves' disease. An autoimmune disorder affecting the eye muscles usually necessitating medications and surgical interventions.

Hemianopia or hemianopsia. A visual impairment stemming from brain injuries or strokes, causing patients to perceive only half of an object in one or both eyes. This condition can also arise following surgeries to excise brain tumors near or within the visual pathway.

Hemifield. Refers to either the left or right half of what one sees.



By **ManFromTheMoon**

Published 26th September, 2023.

Last updated 26th September, 2023.

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Glossary (cont)

- Heteronymous.** A visual discrepancy where each eye sees differently. For instance, one eye might have a blind spot in the upper left while the other has it in the lower right.
- Homonymous.** A consistent visual issue in both eyes, like having blind spots in the same locations in both eyes.
- Hyperopia or farsightedness.** A vision condition where distant objects appear clear, but close ones do not. Glasses often correct this.
- Iris.** The eye's colored segment, regulating light entry by controlling the pupil's size, akin to a camera's aperture.
- Ischemia.** A reduction in blood flow that could harm the retina or brain. It may result from obstructions like blood clots or from vessel spasms, possibly due to stress.
- Lateral geniculate nucleus (LGN).** A structure in the brain's thalamus that processes incoming visual signals from the retina. It's pivotal for sensory interpretation and movement, processing visual information..
- Lazy eye.** Also termed Amblyopia.
- Lens.** The eye's innate optical component, focusing light rays on the retina.
- Low vision.** Reduced visual capability, making day-to-day tasks challenging even with corrective measures like glasses or surgery.
- Lutein.** A vision-shielding vitamin found in leafy greens like spinach and kale, sourced from plants.
- Macula.** The retina's centermost portion, pivotal for clear central sight.
- Microsaccades.** Minor, rapid eye twitches crucial for high-resolution vision; too subtle to see unaided.
- Monocular vision.** The vision from one eye when looking straight.
- Muscular asthenopia.** A technical term indicating tired eyes.
- Myopia or nearsightedness.** A visual issue where nearby objects are clear, but distant ones are not, often rectified with glasses.

For in-depth articles and insights into the world of vision science, explore the Savir Center blog

Glossary B

- Occipital lobe.** The brain region at the back, dedicated to vision processing.
- Open-angle glaucoma.** A prevalent type of glaucoma caused by a buildup of eye fluid due to obstructed drainage channels.
- Ophthalmologist.** A physician specializing in comprehensive eye care, including surgeries.
- Ophthalmoscope.** A tool combining mirrors and lenses, enabling doctors to inspect the eye's interior.
- Optical coherence tomography (OCT).** A non-invasive technique using infrared light to visualize the retina's different cellular layers.
- Optic chiasm.** The intersection point near the brain's base where optic nerve fibers from both eyes cross.
- Optic nerve.** The conduit carrying vision signals from the retina to the brain.
- Optician.** A professional skilled in adjusting and repairing eyeglasses.
- Optic neuritis.** An inflammatory condition of the optic nerve. It can be painful and can lead to temporary vision loss. Despite the fact that MS is often connected with optic neuritis, not everyone who has the condition will go on to acquire MS.
- Optic tract.** The pathway following the optic chiasm, transporting visual information to the brain's thalamus and occipital lobe for processing.
- Optometrist.** A healthcare professional trained in eye examinations and prescribing corrective lenses but not qualified for surgeries.
- Perimeter.** Equipment used for a perimetry test to evaluate visual fields.
- Perimetric charts.** Visual diagrams resulting from field testing.
- Perimetry test.** An assessment of one's visual range using intermittent lights, done using a perimeter.
- Peripheral vision.** The side vision beyond the direct line of sight.
- Photons.** Elemental particles of light that are the fundamental units of electromagnetic radiation.
- Photoreceptors.** Specialized nerve cells in the retina that convert light into nerve signals.
- Preferred retinal location.** The functional retinal sections people with central vision loss use for fixation. Also termed "eccentric fixation."
- Presbyopia.** An age-related decline in near-vision focus.
- Pretegmentum.** A brain stem section controlling pupil size.



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Published 26th September, 2023.

Last updated 26th September, 2023.

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Glossary B (cont)

Primary visual cortex (V1). A region in the occipital lobe's rear where visual interpretation commences.

Prism. A geometric optical element that bends light. Occasionally used to shift the missing visual field portion into a person's unimpaired visual field.

Pupils. The black centers in the eyes, the portals through which light enters. Iris-controlled size adjustments determine the light amount entering.

Quadrantanopia. A visual disorder akin to hemianopia, but affecting roughly a quarter of the visual field, which can be in the upper or lower quadrant of one or both eyes.

Receptive field. A visual field segment where stimuli can activate specific nerve cells.

Refractive errors. Visual disturbances caused by light not accurately focusing on the retina. These often lead to blurry vision and are linked to changes in the cornea, lens, or eye shape occurring in e.g. myopia, hyperopia, or astigmatism.

Relative defect. A visual field region with compromised but not entirely lost vision. Determined using a perimetry test.

Residual vision. The remaining vision after a loss, typically referring to diminished but neither absent nor normal sight.

Retina. The tissue lining the eye's interior, responsible for converting light images to neural signals.

Retinitis pigmentosa. A hereditary eye disorder that damages the retina's photoreceptor cells, potentially progressing to total blindness.

Rods. Retinal nerve cells primarily sensitive to varying light intensities.

Saccadic eye movement training. Techniques teaching vision loss patients to expand their field of view through rapid, scanning eye movements.

Sclera. The white, sturdy outer layer encasing most of the eyeball.

Scotoma. A vision loss patch in the visual field due to an ailment, distinct from the innate blind spot.

Secondary visual cortex. The brain cortex section further handling information from the primary visual cortex or through the extrastriate route. This region contains multiple processing centers, such as V2, V3, V4, and V5, responsible for discerning colors, movements, and other visual features.

Glossary B (cont)

Sightblindness. Hidden visual deficits in an ostensibly normal visual field section, possibly resulting from a generalized deceleration in brain information processing.

Stereopsi loss. The loss of 3D vision or depth perception, potentially due to ocular movement issues or brain injury. As a result, vision might seem two-dimensional.

Strabismus. A misalignment of the eyes often resulting from muscular coordination issues.

Substitution. The approach of leveraging one sensory perception (like hearing) to compensate for another's loss (like sight).

Superior colliculus. A segment of the brain's tectum assisting with eye focusing, movement, and spatial orientation.

Suprathreshold perimetry. A method utilizing high-intensity (or bright) light to assess the visual field, specifically to highlight the remaining vision capabilities.

Suprathreshold perimetry. An evaluation employing low-intensity (or dim) illumination to identify vision deficits.

Tectum. Situated in the brain's midpoint, this region harmonizes eye movements and merges visual data with inputs from other senses.

Tonometry. A diagnostic tool that gauges eye pressure, instrumental in identifying glaucoma and related eye conditions arising from pressure imbalances.

Transorbital alternating current stimulation (tACS). A technique for vision restoration involving minor electric currents transmitted to the eye via forehead-placed electrodes. These currents induce simultaneous firing (or synchronization) of the retina's cells, bolstering existing vision.

Tunnel vision. A narrowed visual scope likened to observing through a tube or tunnel, limiting one's view to just a central patch.

Uveitis. An assortment of eye disorders characterized by inflammation, leading to swelling and potential tissue damage.

Visual acuity. A quantification of the clarity of someone's sight, where greater clarity corresponds to a higher resolution.

Visual field. The total span visible when one's gaze remains forward, avoiding any eye or head movement.

Visual field border. The demarcation indicating the extent of one's sight without the need for head or eye movement.



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Published 26th September, 2023.

Last updated 26th September, 2023.

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Glossary B (cont)

Visual field chart. A graphical representation, based on perimetry test outcomes, detailing areas of clear vision, diminished (or residual) vision, and total vision loss.

Visual field tests. Evaluations gauging both central and peripheral visual capacities.

Vision restoration training. A therapeutic approach for individuals with compromised vision, employing tailored exercises to invigorate nerve cells and expand visual range. The regimen commonly spans multiple months.

Vision therapy. A treatment regimen, predominantly managed by optometrists, consisting of exercises tailored for the eyes and brain. It addresses issues such as amblyopia, strabismus, double vision, convergence deficiencies, and select learning and reading challenges.

Visual phantoms. Phenomena where individuals with vision loss encounter hallucinations during periods when the brain undergoes active restoration and self-repair.

Visual template. Neural blueprints of standard shapes, forms, and objects ingrained from experiences in early youth. The brain consistently contrasts these templates with visual inputs to recognize surrounding entities.

Visual word form area. A term describing a brain region activated by both Braille reading and standard sighted reading, underscoring its role in literary processing.

Zeaxanthin. A vitamin essential for vision protection, sourced from plants. Paired with lutein, it's present in the yellow pigments of vegetables like leafy greens, fruits, and orange bell peppers.



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