

Dolman Method

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September 26, 2025

RECOMMENDED CITATION

mohammad looti (2025). *Dolman Method*. PSYCHOLOGICAL SCALES. Retrieved from <https://scales.arabpsychology.com/?p=28723>

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Primary Disciplinary Field(s): Optometry, Ophthalmology, Vision Science, Sports Vision, Human Factors

1. Core Definition

The **Dolman method**, often colloquially referred to as the "hole in the card" test, represents a fundamental and widely utilized clinical procedure for assessing an individual's **ocular dominance**, specifically their **sighting dominance**. This simple, non-invasive technique provides a qualitative determination of which eye is preferentially used for monocular tasks requiring precise visual alignment and fixation on a distant target. Unlike assessments of visual acuity, which measure the sharpness of vision, the Dolman method identifies the eye that the brain favors for directing gaze and spatial orientation, acting as the primary reference point in binocular vision when aligning a target.

The essence of the Dolman method lies in its elegant simplicity. It involves the subject holding a small piece of cardboard, typically square-shaped, with a small aperture or hole punched in its center. This card is held at arm's length, and the individual is instructed to fixate on a distant object through the hole while keeping both eyes open. The crucial step follows, where the test administrator or the individual themselves alternately occludes one eye at a time. The eye through which the distant target remains continuously visible, without requiring any compensatory shift in the card's position or the head's orientation, is identified as the dominant or sighting eye.

This test primarily evaluates the motor component of ocular dominance, sometimes termed "sighting dominance" or "fixation dominance," distinguishing it from other forms such as **sensory dominance**, which relates to the eye providing superior visual input (e.g., better acuity, contrast sensitivity). The underlying principle is that the dominant eye maintains a stable line of sight to the target, allowing for an uninterrupted view through the fixed aperture. If the non-dominant eye were to take over, a slight shift in the card's position would be required to realign the target, indicating that the initial binocular fixation was driven by the other eye.

2. Etymology and Historical Context

While the exact origins of the term "Dolman method" are not extensively documented with a singular, definitive inventor, the "hole in the card" test or "peep-hole" test has been a staple in ophthalmology and optometry for a considerable period. It is often attributed eponymously, though a specific historical figure named Dolman who formally introduced or popularized this exact method remains elusive in widely available academic literature. Nevertheless, the technique itself, based on the principle of aiming or sighting through an aperture, predates modern optometry and likely

evolved from practical observations of how individuals naturally align visual targets.

The concept of **ocular dominance** itself has a rich historical lineage, with early observations noting that individuals naturally favored one eye for tasks requiring precision. This understanding has been refined over centuries, moving from anecdotal observations to more systematic investigations in the fields of physiology, psychology, and vision science. The Dolman method emerged as one of the earliest and most straightforward clinical tools to quantify this phenomenon, offering a rapid, accessible means of identifying the sighting dominant eye without requiring complex instrumentation.

Its widespread adoption speaks to its practical utility and ease of implementation. In the early 20th century, as optometry and ophthalmology began to establish more standardized diagnostic procedures, simple tests like the Dolman method became invaluable. It provided a quick screening tool for practitioners to understand a patient's visual preference, which could then inform further diagnostic steps or management strategies. Its enduring presence in clinical practice underscores its fundamental role in the comprehensive assessment of the visual system, even as more sophisticated methods have been developed.

3. Procedural Methodology

The execution of the Dolman method is characterized by its straightforward, sequential steps, designed to elicit a consistent and reliable indication of sighting dominance. The test requires minimal equipment: a small, opaque piece of material, typically a square of cardboard approximately 10x10 cm, with a central hole of about 2-3 cm in diameter, and a readily identifiable distant target. The target should be well-illuminated and distinct, situated at a distance of at least 3 to 6 meters (10 to 20 feet) or further to ensure that accommodation demands are minimal and the visual axes are nearly parallel.

The procedure commences with the individual holding the cardboard square in front of their face, typically with both hands, extending their arms fully. They are then instructed to look through the central hole with both eyes open, focusing intensely on the designated distant target. It is crucial at this stage that the individual maintains a steady fixation on the target through the aperture, ensuring no head movement or shifting of the card occurs initially. This binocular fixation establishes the baseline alignment through the hole, with input from both eyes contributing to the perception of the target.

The critical phase involves monocular occlusion. While maintaining the position of the card and fixation on the distant target, the individual or examiner alternately occludes one eye. For instance, the left eye is closed or covered, and the individual observes if the target remains visible through the hole using only the right eye. This is then repeated for the other eye. If the distant target remains clearly visible and centered within the hole without any apparent shift in the card's position

when a particular eye is open and the other is occluded, that eye is identified as the **sighting dominant eye**. Conversely, if closing one eye causes the target to disappear from the aperture, necessitating a slight repositioning of the card to reacquire the target, the occluded eye was the dominant one in the initial binocular alignment.

4. Underlying Principles of Ocular Dominance Assessment

The Dolman method effectively assesses **sighting dominance** by capitalizing on the brain's inherent tendency to prioritize visual input from one eye over the other for certain tasks, particularly those requiring precise spatial alignment. Sighting dominance is distinct from other forms of ocular dominance, such as **sensory dominance**, which refers to the eye providing clearer or more robust visual information, or **motor dominance**, which might involve one eye leading in vergence movements. The Dolman method specifically probes the eye's role as the primary "aiming" or "pointing" eye, which is critical for tasks like targeting or alignment.

At a neural level, ocular dominance reflects the unequal contributions of the two eyes to the central visual processing system. While binocular vision typically involves fusion of images from both eyes, the brain often exhibits a subtle preference or weighting towards one eye for establishing a stable line of sight. In the context of the Dolman method, when an individual fixates on a distant target through a small aperture, the dominant eye's visual axis is typically aligned more directly with the target and the center of the aperture. This preferential alignment allows the dominant eye to maintain its view of the target without needing to adjust the physical position of the viewing device.

The brain's mechanism for selecting a dominant eye for sighting tasks is complex and involves a hierarchy of visual processing. It is thought to be influenced by factors such as visual acuity, retinal correspondence, and potentially neural circuitry that dedicates more resources to the dominant eye for certain spatial tasks. The Dolman test leverages this preferential processing by creating a scenario where only one eye can effectively maintain the target's visibility through a fixed opening. If the non-dominant eye were to attempt to maintain fixation alone, it would require a slight shift in the head or card position, indicating that it was not the eye primarily responsible for the initial binocular alignment.

5. Applications Across Disciplines

The determination of ocular dominance using methods like the Dolman test holds significant practical relevance across a variety of disciplines, extending beyond the traditional confines of optometry and ophthalmology. Understanding which eye is dominant can inform training, equipment selection, and ergonomic adjustments, thereby optimizing performance and mitigating potential issues in numerous fields.

In the realm of **sports vision**, eye dominance is a critical factor, particularly in activities requiring

precise aiming and hand-eye coordination. Athletes involved in shooting sports (e.g., rifle, archery), golf, baseball, and billiards often benefit from knowing their dominant eye. For example, a shooter with right eye dominance typically finds it easier to aim a rifle from the right shoulder. If an athlete's dominant eye is opposite to their dominant hand (e.g., right-handed but left-eye dominant), it can lead to cross-dominance issues that may require specific training adjustments or equipment modifications to optimize performance. Coaches and trainers often use the Dolman method as a preliminary screening tool to tailor training regimens.

Beyond sports, ocular dominance is pertinent in various **occupational tasks** demanding high visual precision. Professions such as surgery, dentistry, microscopy, and certain types of precision assembly work often require workers to operate instruments or view objects through monocular scopes. Knowing the dominant eye can help in configuring workstations or choosing which eye to use for these tasks, reducing strain and improving accuracy. For instance, a surgeon might prefer to use their dominant eye when looking through a microscope, enhancing their spatial judgment and dexterity.

Within clinical practice, the Dolman method assists in **vision therapy**, particularly when addressing binocular vision anomalies. Identifying a lack of clear dominance or inconsistencies can be diagnostic for underlying visual processing challenges. Furthermore, in the correction of presbyopia, especially with **monovision contact lenses** or intraocular lenses, the dominant eye is typically corrected for distance vision, while the non-dominant eye is corrected for near vision. This strategic allocation of visual tasks relies fundamentally on an accurate determination of ocular dominance, which the Dolman method provides as a quick and reliable initial assessment.

6. Clinical and Practical Implications

The Dolman method, despite its simplicity, carries substantial weight in clinical settings, serving as a foundational diagnostic and planning tool for eye care professionals. Its primary implication lies in its ability to rapidly screen for a fundamental aspect of an individual's visual organization: their sighting preference. This initial assessment can provide critical insights that guide further, more complex evaluations and inform therapeutic strategies.

From a diagnostic perspective, the Dolman method can contribute to the comprehensive evaluation of **binocular vision anomalies**. While a clear dominant eye is typical, inconsistent results or a lack of definitive dominance might signal underlying issues with binocular coordination, amblyopia, or strabismus, prompting the clinician to conduct more thorough examinations. It helps to understand how the two eyes are working together, or if one eye is consistently being suppressed or ignored in central fixation tasks.

In treatment planning, particularly for patients with **presbyopia** considering refractive correction, the Dolman method is indispensable. For monovision correction, whether with contact lenses,

spectacles, or intraocular lens implants, the dominant eye is typically targeted for distance vision, while the non-dominant eye is corrected for near vision. The success of monovision relies heavily on correctly identifying the dominant eye, and the Dolman test provides a quick, reliable starting point for this decision, minimizing trial-and-error and improving patient adaptation.

Moreover, the method has practical applications in **patient education and ergonomics**. Explaining ocular dominance to patients can help them understand their own visual strengths and how they interact with their environment. For individuals engaging in specific hobbies or professions, this knowledge can be empowering, allowing them to make informed choices about equipment, posture, or task execution. For instance, an individual struggling with a new firearm might discover a cross-dominance issue through this test, leading to adjustments in their shooting stance or the choice of sights, thereby improving accuracy and comfort.

7. Advantages and Limitations

The enduring popularity of the Dolman method stems from several key advantages that make it an attractive choice for practitioners and individuals alike. Foremost among these is its **simplicity** and **accessibility**. The test requires virtually no specialized equipment, relying only on a piece of cardboard with a hole and a distant target, making it incredibly inexpensive and easy to prepare. This minimal requirement ensures that the test can be administered in almost any setting, from a bustling clinic to an outdoor sports field, with immediate results. Furthermore, its **non-invasive** nature and straightforward instructions contribute to high patient acceptance and ease of understanding, making it suitable for a wide range of ages and cognitive abilities.

Despite its undeniable practical benefits, the Dolman method is not without its limitations, which necessitate careful interpretation of its results and consideration of its scope. One of the primary drawbacks is its **subjectivity**. The test relies heavily on the individual's self-reporting and their accurate perception of whether the target remains visible without shifting. This introduces a potential for misinterpretation or inconsistent responses, especially in younger children or individuals with communication difficulties. The instruction must be clear and consistently applied to minimize variability.

Another significant limitation is that the Dolman method exclusively assesses **sighting dominance** and does not provide information about other forms of ocular dominance, such as sensory dominance or motor dominance in terms of vergence movements. An individual may have a strong sighting dominant eye but exhibit sensory dominance in the other eye due to better visual acuity or contrast sensitivity. Moreover, the test provides a qualitative "left" or "right" dominant result, lacking any quantitative measure of the *degree* of dominance. Some individuals might exhibit **ambidextrous ocular dominance**, where neither eye shows a strong, consistent preference, leading to ambiguous results with this simple test. Factors such as target distance,

lighting conditions, and the size of the aperture can also subtly influence outcomes, underscoring the need for standardized administration protocols to enhance reliability.

8. Alternative Methods of Ocular Dominance Assessment

While the Dolman method remains a cornerstone for assessing sighting dominance due to its simplicity, several other tests exist that either corroborate its findings or provide alternative perspectives on ocular dominance. These methods often vary in their complexity, equipment requirements, and the specific aspect of dominance they aim to measure. Understanding these alternatives is crucial for a comprehensive assessment of a patient's visual system, especially when the Dolman method yields ambiguous results or when more detailed information about sensory or motor dominance is required.

One widely recognized alternative is the **Miles test**, also known as the "hand-sighting" or "triangle" test. In this procedure, the individual forms a small triangle with their thumbs and index fingers, holds their hands at arm's length, and centers a distant object within the aperture created by their hands. Similar to the Dolman method, they then alternately close each eye. The eye through which the object remains visible within the "triangle" is considered the dominant eye. The Miles test is conceptually very similar to the Dolman method, also assessing sighting dominance, and shares its advantages of being quick, simple, and requiring no special equipment.

Another common test is the **Porta test**, sometimes called the "tube test" or "telescope test." For this, the individual rolls a piece of paper into a tube and holds it up to one eye to view a distant object. They then switch the tube to the other eye to see which eye they naturally prefer to use for viewing through the tube. This test also primarily evaluates sighting dominance and is often used alongside the Dolman and Miles tests as a cross-referencing method. Clinical settings may also employ more sophisticated methods to assess sensory dominance, such as using neutral density filters to determine which eye tolerates greater occlusion before causing a shift in binocular balance, or employing specific binocular balance tests during refraction.

For research and more detailed clinical evaluations, instrument-based methods provide more objective and quantitative measures. These can include tests that measure rivalry suppression, visual evoked potentials (VEPs), or fMRI studies to observe cortical activation patterns in response to monocular stimulation. While these methods offer a deeper understanding of the neural underpinnings of ocular dominance, their complexity and cost limit their widespread use in routine clinical practice, where the Dolman, Miles, and Porta tests serve as invaluable and accessible screening tools.

9. Further Research and Future Directions

Despite the long-standing use of the Dolman method and other simple ocular dominance tests, the

field continues to evolve with ongoing research aimed at a deeper understanding of visual processing and its clinical implications. One significant area of future research involves developing more objective and quantitative measures of ocular dominance. While the Dolman method provides a binary "left" or "right" dominant assessment, there is a growing need for tools that can quantify the *degree* of dominance or identify nuanced shifts, especially in individuals with ambiguous or mixed dominance. This would allow for more precise interventions and personalized treatments, particularly in fields like sports vision or surgical planning.

Further investigation into the neurophysiological basis of ocular dominance is also critical. Understanding the neural circuitry and cortical mechanisms responsible for eye preference can lead to novel diagnostic techniques and therapeutic strategies. Research could explore how factors such as attention, cognitive load, and visual experience influence dominance, potentially revealing pathways for training or adapting visual preferences in specific contexts. For instance, exploring the plasticity of ocular dominance and whether it can be intentionally modified through targeted vision training remains a fascinating area of inquiry, especially for athletes or professionals whose tasks demand specific visual skills.

Another important direction for future research is the standardization of protocols for all ocular dominance tests, including the Dolman method. While its simplicity is a strength, variability in instruction, target distance, and lighting can affect results. Establishing universally accepted guidelines for administration, interpretation, and reporting would enhance the reliability and comparability of findings across different studies and clinical settings. Moreover, exploring the correlation between different types of dominance (sighting, sensory, motor) and their respective impacts on various visual tasks and patient outcomes could provide a more holistic understanding of an individual's visual profile, moving beyond a single, isolated measure of eye preference.

Further Reading

[Ocular dominance - Wikipedia](#)

[Ocular Dominance - EyeWiki \(American Academy of Ophthalmology\)](#)

[What Is Strabismus? - American Academy of Ophthalmology](#)

[Amblyopia - Wikipedia](#)

[Presbyopia - Wikipedia](#)