

Definitions for words and phrases associated with vision and perception

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A pillar

The support built into a car supporting the front of the roof at the sides of the windshield. See B pillar and C pillar). Pillars can block a driver's vision.

Attention

Attention is the behavioral and cognitive process of selectively concentrating on a discrete aspect of information, whether considered subjective or objective, while ignoring other perceivable information. It is a state of arousal. In order to see, for example, vulnerable road users, drivers must attend to these users.

Attentional blink

Attentional Blink (AB or 'blink' is the phenomenon that the second of two targets cannot be detected or identified when it appears close in time to the first.

B pillar

The middle support built into a car behind the front seat supporting the roof in the middle and supporting the door(s). See A pillar and C pillar. Pillars can block a driver's vision.

C pillar

The support built into a car supporting the rear of the roof. See B pillar and A pillar. Pillars can block a driver's vision.

Central vision

Central vision is a small (only about 3 degrees) where our vision is clear and in focus. Our eyes move so quickly, however, that our surroundings mostly look in focus.

Change blindness

Change blindness is a perceptual phenomenon that occurs when a change in a visual stimulus is introduced and the observer does not notice it. For example, observers often fail to notice major differences introduced into an image while it flickers off and on again. People's poor ability to detect changes has been argued to reflect fundamental limitations of human attention. Change blindness has become a highly researched topic and some have argued that it may have important practical implications in areas such as eyewitness testimony and distractions while driving.

Cognitive capture

Cognitive capture or, cognitive tunneling, is an inattentive blindness phenomenon in which the observer is too focused on instrumentation, task at hand, internal thought, etc. and not on the present environment. For example, while driving, a driver focused on the speedometer and not on the road is suffering from cognitive capture.

Conspicuity

Having to do with or about conspicuous – noticeable, visible.

Constant bearing

A problem well known in nautical and aviation circles but little addressed in traffic safety. If the approaching vehicle is hidden behind the A pillar when the driver starts to look to scan the road to check if it is safe to emerge, and the two vehicles stay on a constant bearing, the vehicle will remain hidden until it is close enough to “expand” around the pillar. The motorcyclist can see the car and assumes the driver can see the motorcyclist – when the driver pulls out the motorcyclist is surprised.

Depth perception

Depth perception is the visual ability to perceive the world in three dimensions (3D) and the distance of an object.

Dynamic visual acuity

The term dynamic visual acuity describes the ability to visually resolve subtle spatial details of an object when the object, the observer, or both, are moving. The ability to discriminate details of an object when there exists relative movement between the object and the observer. Compare to static visual acuity.

Dominant eye

The dominant eye is the one that provides a slightly greater degree of input to the visual part of your brain and more accurately relays information about the location of objects. In most cases, the term "dominant eye" is used when describing the normal visual condition where the two eyes function well as a team and have relatively equal visual acuity, and one eye is simply the "leading" or preferred eye.

DRL(s)

Day time running light(s). Recommended to enhance motorcycle/motorcyclist conspicuity.

Eye movement

There are three basic types of eye movements: Fixations: ability to hold eyes steady without moving off target. Saccades: the ability of our eyes to make accurate jumps as we change targets. Pursuits: the ability of our eyes to follow moving targets. All three play a role in a driver’s ability to detect or not an approaching motorcyclist (see especially saccadic suppression).

Executive functions

Executive function (EF) refers to a set of self-regulatory cognitive processes that underlie goal-directed behavior and support individuals faced with new or complex situations. Executive function is a cognitive process involved in controlling behavior and reading the person for situations. EF comprises the ability to be mentally and behaviorally flexible to changing conditions and to provide coherence and smoothness in one’s responses. EF’s are higher-order mind-brain functions such as goal setting, planning, ordering, prioritizing, initiating, shifting, and monitoring.

Fovea

In the eye, a tiny pit located in the macula of the retina that provides the clearest vision of all. Only in the fovea are the layers of the retina spread aside to let light fall directly on the cones, the cells that give the sharpest image. Also called the central fovea or fovea centralis (see central vision and foveal zone).

Foveal zone

Within the fovea is a region devoid of retinal blood vessels known as the foveal avascular zone (FAZ). The geometric center of the FAZ is often taken to be the center of the macula and thus the point of fixation – a narrow cone in the center of our field of vision that is actually clear, focused and full-color – a tiny patch that actually transmits a camera-like image to the brain.

Gap acceptance

How a driver calculates the “time to collision” and decides whether or not a gap ahead of an approaching vehicle represents a safe distance and then makes a decision whether or not to pull out. Most maneuvers will require a gap of 5 seconds to safety complete (see size arrival effect).

Hazard

Any permanent or transitory, stationary or moving object in the road environment that has the potential to increase the risk of a crash

Hazard perception

The ability to read the road and anticipate forthcoming events. The ability to identify potentially dangerous traffic situations. The process whereby a road user notices the presence of a hazard.

High visibility or hi-vis, hi-viz

Term used to describe motorcyclist riding gear designed to be more (highly) visible to other road users.

Illusion

An illusion is a distortion of the senses, which can reveal how the human brain normally organizes and interprets sensory stimulation. Though illusions distort our perception of reality, they are generally shared by most people.

Impulsiveness

Impulsiveness (or impulsivity) is a tendency to act on a whim, displaying behavior characterized by little or no forethought, reflection, or consideration of the consequences (see executive functions).

Inattention

Inattention is the lack of focus when focus on a given event or situation is required. Failure to attend.

Inattentional blindness

Inattentional blindness is the failure to notice a fully-visible, but unexpected object because attention was engaged on another task, event, or object. This phenomenon, rooted in the way the human brain processes (or fails to process) information, provides a framework to understand the looked-but-failed-to-see (LBFTS) crashes commonly associated with motorcycle collisions.

Insight training

Relatively new (2018) term associated with rider training that focuses on enhancing the rider's understanding of risk by improving hazard awareness, risk assessment and risk management that requires an understanding of where things go wrong, rather than in how to ride the "right way."

LBFTS

Abbreviation for "Looked But Failed to See." Sometimes combined with ROWV (see SMIDSY)

Luminance

The quality or state of being luminous which is emitting or reflecting usually steady, suffused, or glowing light

Luminance Contrast

The relationship between the luminance of a brighter area of interest and that of an adjacent darker area.

MAIDS

The pan-European study "Motorcycle Accidents In-Depth Study."

Metacognition

The notion of thinking about one's own thinking. Metacognition is "cognition about cognition", "thinking about thinking", "knowing about knowing", becoming "aware of one's awareness" and higher-order thinking skills.

Motion camouflage

Motion camouflage is camouflage which provides a degree of concealment for a moving object, given that motion makes objects easy to detect even when their coloration matches their background or breaks up their outlines. The principal form of motion camouflage, and the type generally meant by the term, involves an attacker's remaining in direct line of the background as seen by its target. Motion camouflage is a dynamic type of camouflage by which an object (you the motorcyclist) can approach a target (auto) while appearing to remain stationary from the perspective of the target. A motorcyclist riding in the left third of the lane while approaching a vehicle preparing to turn left has often placed him/her self in a position which his/her background does not change from the point of view of the driver.

Optical illusion

An optical illusion is an illusion caused by the visual system and characterized by a visual percept that arguably appears to differ from reality. There are three main classes: physical, physiological, and cognitive illusions, and in each class there are four kinds: Ambiguities, distortions, paradoxes, and fictions.

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Parallax

The effect whereby the position or direction of an object appears to differ when viewed from different positions.

Peripheral vision

Peripheral vision, or indirect vision, is vision as it occurs outside the point of fixation, i.e. away from the center of gaze. The vast majority of the area in the visual field is included in the notion of peripheral vision. Color and clarity of objects detected in peripheral vision are significantly less than in central vision (see central vision).

Perception

Perception is the organization, identification, and interpretation of sensory information in order to represent and understand the presented information or environment.

Perceptual workload (overload)

A theory which suggests that humans process visual information with limited capacity and therefore visual information must be selected by a sensory filter. All information is not directly attended to. It may be that perceptual workload affects a driver's situational awareness especially at unfamiliar or extremely busy intersections.

Power-two wheeler (PTW)

Often used in research to identify motorcycles, scooters, and mopeds

Prevalence

Refers to how common an object is. We see what we expect to see. Motorcycles (and busses) are not common (not prevalent) on the roads therefore they are less likely to be "seen" than more prevalent vehicles like cars.

Repetition blindness

Repetition blindness (RB) is a phenomenon observed in rapid serial visual presentation. People are sometimes poor at recognizing when things happen twice. Repetition blindness is the failure to recognize a second happening of a visual display.

ROW & ROWV

Right of Way and Right of Way Violation

Saccade

A saccade is a quick, simultaneous movement of both eyes between two or more phases of fixation in the same direction. Humans and many animals do not look at a scene in fixed steadiness; instead, the eyes move around, locating interesting parts of the scene and building up a mental, three-dimensional 'map' corresponding to the scene (see saccadic movement).

Saccadic movement

When scanning immediate surroundings or reading, human eyes make saccadic movements and stop several times, moving very quickly between each stop. The speed of movement during each saccade cannot be controlled; the eyes move as fast as they are able. Look in a mirror and move your eyes from left to right. You will not be able to see your own eye movement but someone watching you can see your eyes move. This phenomenon helps explain why some drivers fail to see an approaching motorcyclist. The motorcyclist is caught in the saccade (see saccadic suppression)

Saccadic suppression (aka saccadic masking)

Saccadic suppression of image displacement (SSID) is the phenomenon in visual perception where the brain selectively blocks visual processing during eye movements in such a way that large changes in object location in the visual scene during a saccade or blink are not detected.

Saliency (see visual saliency)

Semantic richness

The idea that our eyes and mind are drawn to those part of a scene that have strong meaning to us or are connected with us in some way. Antique car buffs easily see and recognize antique cars in the traffic mix. Drivers interested in purchasing a new GMC pickup truck, recognize that make and model on the road. Motorcyclists see motorcyclists.

Sensory conspicuity

Related to visual saliency – the visual distinction of one object within the environment due to luminance contrast, color and edge orientation.

Situational awareness

Situational awareness or situation awareness (SA) is the perception of environmental elements and events with respect to time or space, the comprehension of their meaning, and the projection of their future status. SA is both a *state* and a *process*. SA depends on information extraction, information integration, mental picture formation and projection and anticipation.

Size-arrival effect

Larger objects are judged to be closer to the point of collision with the viewer than smaller objects are, even if the larger object is farther away. This is known as the size-arrival effect. The size-arrival effect results in an illusion that smaller objects are less likely to collide with the viewer. Drivers may estimate the time to arrival of motorcycles to be later than cars because motorcycles are smaller.

SMIDSY

Abbreviation used in Great Britain, Australia, New Zealand for “Sorry mate, I didn’t see you” for the crash caused by an auto driver who violates the motorcyclist’s right of way (ROW)

Static visual acuity

Static visual acuity (SVA) is defined as the ability to distinguish the details of static objects whose image is formed on the retina when the evaluated subject is also stationary (see dynamic visual acuity).

Target fixation

Target fixation is when your overall focus (eyes and mind) narrows to one point to the exclusion of other sources of information. It was coined for the phenomenon of WWII fighter planes accidentally crashing into targets they were trying to destroy. They focused all of their attention on the target and flew right into it. This phenomenon can affect motorcyclists as well, and in some cases can be a primary cause of a crash.

Visual acuity

The sharpness of vision, measured by the ability to discern letters or numbers at a given distance according to a fixed standard.

Visual attention

The term “visual attention” refers to a set of cognitive operations that mediate the selection of relevant and the filtering out of irrelevant information from cluttered visual scenes.

Visual autopilot

A relaxed mode where searching become mechanical and routine responding to regular visual clues especially on familiar routes.

Visual masking

Visual masking is the reduction or elimination of the visibility of one brief (≤ 50 ms) stimulus, called the “target”, by the presentation of a second brief stimulus, called the “mask”.

Visual salience

An objects distinct perceptual quality which draws our eyes often related to contrast or brightness. The fundamental concept underpinning the recommended use of conspicuity aids – to increase salience.

Visual screening (inadequate)

Inadequate visual screening is failing to look at the correct location at the correct moment (in order to see an approaching hazard).

Visual tracking

Visual tracking is a visual processing skill that occurs when the eyes focus on an object as it moves across the field of vision. Visual tracking occurs with movement of the eyes to follow a moving object and not movement of the head.

Windshield or window zoning

A phenomenon connected to the “frame” created by an automobile's support pillars where the pillars create a frame around the window or windshield. The pillars create a physical blind spot. However, there is a phenomenon where we tend to look through the areas well away from the “frame” (we don't look through the entire window opening) creating a psychological blind spot even bigger than the physical blind spot. This phenomenon is sometimes called windshield or window zoning or framing.