Glossary

Ability A general trait or capacity of an individual that is a determinant of a person's achievement potential for the performance of specific skills.

Absolute error (AE) The unsigned deviation from the target or criterion, representing amount of error. A measure of the magnitude of an error without regard to the direction of the deviation.

Acceleration A kinematic measure that describes change in velocity during movement; we derive it from velocity by dividing change in velocity by change in time.

Action effect hypothesis The proposition that actions are best planned and controlled by their intended effects. When related to attentional focus, this hypothesis proposes that the learning and performance of skills are optimized when the performer's attention is directed to the intended outcome of the action rather than on the movements themselves.

Action preparation The activity that occurs between the intention to perform an action and the initiation of that action. Sometimes, the term *motor programming* is used to refer to this preparation activity.

Actions See *motor skills.*

Affordance The reciprocal fit between the characteristics of a person and the characteristics of the environment that permit a specific action to occur, such as stairs having the physical characteristics to permit stair climbing.

Arousal The general state of excitability of a person, involving physiological, emotional, and mental systems. Terms such as *anxiety* and *intensity* are sometimes used synonymously in psychological contexts.

Ascending tracts Sensory neural pathways in the spinal cord and brainstem that connect with the various sensory areas of the cerebral cortex and cerebellum.

Associative stage The second stage of learning in the Fitts and Posner model. An intermediate stage on the learning stages continuum.

Asymmetric transfer Bilateral transfer in which there is a greater amount of transfer from one limb than from the other limb.

Attention In human performance, characteristics associated with consciousness, awareness, and cognitive effort as they relate to the performance of skills. Of particular interest are limitations associated with these characteristics on the simultaneous performance of multiple skills and the detection of relevant information in the performance environment.

Attentional focus The directing of attention to specific characteristics in a performance environment, or to action preparation activities.

Attractors The stable behavioral steady states of systems. In terms of human coordinated movement, attractors characterize preferred behavioral states, such as the in-phase and antiphase states for rhythmic bimanual finger movements.

Augmented feedback A generic term used to describe information about a performance that supplements the sensory feedback and comes from a source external to the performer; it is sometimes referred to as *extrinsic* or *external* feedback.

Automaticity The term used to indicate that a person performs a skill, or engages in certain information-processing activities, with little or no demands on attention capacity.

Autonomous stage The third stage of learning in the Fitts and Posner model. The final stage on the learning continuum. Also called the *automatic stage.*

Axons Extensions from a neuron's cell body that transmit neural impulses to other neurons, structures in the CNS, or muscles; a neuron has only one axon, although most axons branch into many branches. Also called *nerve fibers.*

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Basal ganglia A subcortical collection of nuclei (caudate nucleus, putamen, and globus pallidus) buried within the cerebral hemispheres; they play an important role in the planning and initiation of movement and the control of antagonist muscles during movement. Also known as the *basal nuclei.*

Bilateral transfer Transfer of learning that occurs between two limbs.

Bimanual coordination A motor skill that requires the simultaneous use of the two arms. The skill may require the two arms to move with the same or different spatial and/or temporal characteristics.

Biofeedback A type of augmented feedback that provides information about physiological processes through the use of instrumentation (e.g., EMG biofeedback).

Brainstem A brain structure located directly under the cerebral hemispheres and connected to the spinal cord; it contains three areas that are significantly involved in motor control: the pons, medulla, and reticular formation.

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Central-resource theories of attention Attention-capacity theories that propose one central source of attentional resources for which all activities requiring attention compete.

Central vision The middle 2 to 5 degrees of the visual field; it is sometimes called foveal vision.

Cerebellum A brain structure located behind the cerebral hemispheres and attached to the brainstem; it is covered by the cerebellar cortex and is divided into two hemispheres; it plays a key role in the execution of smooth and accurate movements.

Cerebral cortex The undulating, wrinkly, gray-colored surface of the cerebrum; it is a thin tissue of nerve cell bodies (about 2 to 5 mm thick) called gray matter.

Cerebrum A brain structure in the forebrain that consists of two halves, known as the right and left cerebral hemispheres.

Choice RT The reaction time when the situation involves more than one signal and each signal requires its own specified response.

Closed-loop control system A system of control in which during the course of an action, feedback is compared against a standard or reference to enable an action to be carried out as planned.

Closed motor skill A motor skill performed in a stationary environment where the performer determines when to begin the action.

Cognitive mediation theory A theory for explaining the benefit of a demonstration proposing that when a person observes a skilled model, the person translates the observed movement information into a cognitive code that the person stores in memory and uses when the observer performs the skill.

Cognitive stage The first stage of learning in the Fitts and Posner model. The beginning or initial stage on the learning continuum.

Complexity The number of parts or components and the degree of information processing that characterize a skill; more-complex skills have more component parts and greater information-processing demands than less-complex skills.

Concurrent augmented feedback Augmented feedback that is provided while a person is performing a skill or making a movement.

Cones One of two types of photoreceptors in the retina; they detect bright light and play critical roles in central vision, visual acuity, and color vision.

Constant error (CE) The signed (+/–) deviation from the target or criterion. It represents amount and direction of error and serves as a measure of performance bias.

Contextual interference The memory and performance disruption (i.e., interference) that results from performing multiple skills or variations of a skill within the context of practice.

Contextual interference effect The learning benefit resulting from performing multiple skills in a high contextual interference practice schedule (e.g., random practice), rather than performing the skills in a low contextual interference schedule (e.g., blocked practice).

Continuous motor skill A motor skill with arbitrary movement beginning and end points. These skills usually involve repetitive movements.

Control parameters Coordinated movement control variables (e.g., tempo, or speed, and force) that freely change according to the characteristics of an action situation. Under certain conditions, they can shift a system's behavior from one coordination pattern to another coordination pattern. According to the dynamical systems view of motor control, when a control parameter is systematically varied (e.g., speed is increased from slow to fast), an order parameter may remain stable or change its stable state characteristic at a certain level of change of the control parameter.

Coordination The patterning of head, body, and/or limb motions relative to the patterning of environmental objects and events.

Coordinative structures Functionally specific collectives of muscles and joints that are constrained by the nervous system to act cooperatively to produce an action. Sometimes referred to as muscle, or motor, synergies.

Cornea A clear surface that covers the front of the eye; it serves as an important part of the eye's optical system.

Cost-benefit trade-off The cost (in terms of slower RT) and benefit (in terms of faster RT) that occur as a result of biasing the preparation of an action in favor of one of several possible actions (as opposed to preparing as if each possible action were equally probable).

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Deafferentation A procedure that researchers use to make proprioceptive feedback unavailable (through surgically severing or removing afferent neural pathways involved in the movement). It also can result from injury, surgery, or disease to afferent neural pathways involved in proprioception.

Declarative knowledge Knowledge about what to do in a situation; this knowledge typically is verbalizable.

Degrees of freedom The number of independent components in a control system and the number of ways each component can vary.

Degrees of freedom problem A control problem that occurs in the designing of a complex system that must produce a specific result. The design problem involves determining how to constrain the system's many degrees of freedom so that it can produce the specific result.

Dendrites Extensions from a neuron's cell body that receive neural impulses from other neurons; a neuron may have none or as many as thousands of dendrites.

Descending tracts Motor neural pathways that descend from the brain through the spinal cord.

Descriptive KP A verbal knowledge of performance (KP) statement that describes only the error a person has made during the performance of a skill.

Diencephalon A component of the forebrain located between the cerebrum and the brainstem; it contains the thalamus and hypothalamus.

Discrete motor skill A motor skill with clearly defined movement beginning and end points, usually requiring a simple movement.

Discrimination RT The reaction time when the situation involves more than one signal but only one response, which is to only one of the signals; the other signals require no response.

Displacement A kinematic measure describing changes in the spatial positions of a limb or joint during a movement.

Distributed practice A practice schedule in which the amount of rest between practice sessions or trials is relatively long.

Diversification The learner's goal in the second stage of learning in Gentile's model for learning open skills in which learners acquire the capability to modify the movement pattern according to environmental context characteristics.

Dual-task procedure An experimental procedure used in the study of attention to determine the amount of attention required to perform an action, or a part of an action. The procedure involves assessing the degree of interference caused by one task when a person is simultaneously performing another task.

Dynamic view of modeling A theoretical view explaining the benefit of observing a skilled model demonstrate a skill. It proposes that the visual system is capable of automatically processing the observed movement in a way that constrains the motor control system to act accordingly, so that the person does not need to engage in cognitive mediation.

Dynamical systems theory An approach to describing and explaining the control of coordinated movement that emphasizes the role of information in the environment and the dynamic properties of the body and limbs. It is also known as the dynamic pattern theory.

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Electroencephalography (EEG) The recording of brain activity by the detection of electrical activity in specific areas on the surface of the cortex by several surface electrodes placed on a person's scalp. Brain activity is recorded as *waves,* which are identified on the basis of the speed of the rhythmic activity.

Electromyography (EMG) A measurement technique that records the electrical activity of a muscle or group of muscles. It indicates the muscle activity.

Encoding A memory process involving the transformation of information to be remembered into a form that can be stored in memory.

Encoding specificity principle A memory principle that indicates the close relationship between encoding and retrieval memory processes. It states that memory test performance is directly related to the amount of similarity between the practice and the test contexts; that is, the more similarity, the better the test performance will be.

Environmental context The supporting surface, objects, and/or other people or animals involved in the environment in which a skill is performed.

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Feedback Information from the sensory system that indicates the status of a movement to the central nervous system. In a closed-loop control system, feedback is used to make corrections to an ongoing movement.

Fine motor skill A motor skill that requires control of small muscles to achieve the goal of the skill; typically involves eye-hand coordination and requires a high degree of precision of hand and finger movement.

Fitts' law A human performance law specifying the movement time for an aiming action when the distance to move and the target size are known. It is quantified as $MT = a + b \log_2(2\ D/W)$, where a and b are constants and W = target width, and D = distance from the starting point to the target.

Fixation The learner's goal in the second stage of learning in Gentile's model for learning closed skills in which learners refine movement patterns so that they can produce them correctly, consistently, and efficiently from trial to trial.

fMRI (functional magnetic resonance imaging) A brain scanning technique that assesses changes in blood flow by detecting blood oxygenation characteristics while a person is performing a skill or activity in the MRI scanner. It provides clear images of active brain areas at a specified time and can provide quantitative information about the levels of brain region activity.

Foreperiod In a reaction time paradigm, the time interval between a warning signal and the go signal, or stimulus.

Fractionization A part-task training method related to asymmetric coordination skills that involves practicing each arm or leg separately before performing with them together.

Freezing the degrees of freedom Common initial strategy of beginning learners to control the many degrees of freedom associated with the coordination demands of a motor skill; the person holds some joints rigid (i.e., "freezes" them) and/or couples joint motions together in tight synchrony while performing the skill.

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General motor ability hypothesis A hypothesis that maintains that the many different motor abilities that exist in an individual are highly related and can be characterized in terms of a singular, global motor ability.

Generalized motor program (GMP) The memory representation of a class of actions that share common invariant characteristics. It provides the basis for controlling a specific action within the class of actions.

Golgi-tendon organs (GTOs) A type of proprioceptor located in the skeletal muscle near the insertion of the tendons into the muscle; they detect changes in muscle tension, or force.

Gross motor skill A motor skill that requires the use of large musculature to achieve the goal of the skill.

Guidance hypothesis A hypothesis indicating that the role of augmented feedback in learning is to guide performance toward the goal of the task; however, if it is provided too frequently, it can cause the learner to develop a dependency on its availability and therefore to perform poorly when it is not available.

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Hick's law A law of human performance stating that RT will increase logarithmically as the number of stimulus-response choices increases.

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Identical elements theory An explanation of positive transfer proposing that transfer is due to the degree of similarity between the component parts or characteristics of two skills or two performance contexts.

Imagery ability An individual-difference characteristic that differentiates people who can image an action with a high degree of vividness and control from people who have difficulty imaging an action.

Index of difficulty (ID) According to Fitts' law, a quantitative measure of the difficulty of performing a skill involving both speed and accuracy requirements. It is calculated as the $\log_2 (2\ D/W)$, where W = target width, and D = distance from the starting point to the target.

Interneurons Specialized nerve cells that originate and terminate in the brain or spinal cord; they function between axons descending from the brain and synapse on motor neurons, and between the axons from sensory nerves and the spinal nerves ascending to the brain.

Intertrial variability An environmental characteristic in Gentile's taxonomy of motor skills. The term refers to whether the regulatory conditions associated with the performance of a skill change or stay the same from one trial to the next.

Invariant features A unique set of characteristics that defines a generalized motor program and does not vary from one performance of the action to another.

Iris The eye structure that surrounds the pupil and provides the eye its color.

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Joint receptors A collection of various types of proprioceptors located in the joint capsule and ligaments; they detect changes in joint movement at the extreme limits of movement and position.

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Kinematics The description of motion without regard to force or mass; it includes displacement, velocity, and acceleration.

Kinetics The study of the role of force as a cause of motion.

Knowledge of performance (KP) A category of augmented feedback that gives information about the movement characteristics that led to a performance outcome.

Knowledge of results (KR) A category of augmented feedback that gives information about the outcome of an attempt to perform a skill.

KR-delay interval The interval of time between the completion of a movement and the presentation of augmented feedback.

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Learning A change in the capability of a person to perform a skill. It must be inferred from a relatively permanent improvement in performance as a result of practice or experience.

Lens The transparent eye structure that sits just behind the iris; it allows the eye to focus at various distances.

Limbic system A group of brain structures consisting of parts of the frontal and temporal lobes of the cerebral cortex, the thalamus and hypothalamus, and the nerve fibers that interconnect these parts and other CNS structures; it is involved in the learning of motor skills.

Long-term memory A component system in the structure of memory that serves as a relatively permanent storage repository for information.

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Manual aiming skills Motor skills that involve arm, hand, and/or finger movements to a target; for example, putting a key into a keyhole, threading a needle with thread, and typing on a computer keyboard.

Massed practice A practice schedule in which the amount of rest between practice sessions or trials is very short.

Mental practice The cognitive rehearsal of a physical skill in the absence of overt physical movements; it can take the form of thinking about the cognitive or procedural aspects of a motor skill, or of engaging in visual or kinesthetic imagery of the performance of a skill or part of a skill.

Modeling The use of demonstration as a means of conveying information about how to perform a skill.

Motor ability An ability that is specifically related to the performance of a motor skill.

Motor control How our neuromuscular system functions to activate and coordinate the muscles and limbs involved in the performance of a motor skill. Researchers may investigate this question while a person is learning a new skill or performing a well-learned or highly experienced skill.

Motor development Human development from infancy to old age with specific interest in issues related to either motor learning or motor control.

Motor equivalence The capability of the motor control system to enable a person to achieve an action goal in a variety of situations and conditions (e.g., writing your signature with either hand).

Motor learning The acquisition of motor skills, the performance enhancement of learned or highly experienced motor skills, or the reacquisition of skills that are difficult to perform or cannot be performed because of injury, disease, and the like. Of interest are the behavioral and/or neurological changes that occur as a person learns a motor skill and the variables that influence those changes.

Motor neurons Nerve cells that send neural impulses from the CNS to skeletal muscle fibers. Also called *efferent neurons*.

Motor program A memory representation that stores information needed to perform an action.

Motor skills Activities or tasks that require voluntary control over movements of the joints and body segments to achieve a goal.

Motor unit The alpha motor neuron and all the muscle fibers it innervates; it serves as the functional unit of motor control for the innervation of the muscles involved in a movement.

Motor unit recruitment The process of increasing the number of motor units needed to increase the number of muscle fibers active at any one time and thereby increase the amount of force the muscle can exert.

Movement time (MT) The interval of time between the initiation of a movement and the completion of the movement.

Movements Specific patterns of motion among joints and body segments used to accomplish action goals.

Multiple-resource theories Theories of attention proposing that there are several attentional resource mechanisms, each of which is related to a specific information-processing activity and is limited in how much information it can process simultaneously.

Muscle spindles A type of proprioceptor consisting of specialized muscle fibers that lie within the fibers of most skeletal muscles; they detect changes in muscle length.

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Negative transfer The negative effect of prior learning on the learning of a new skill or the performance of a skill in a new context.

Neuron A nerve cell; the basic component of the nervous system.

Nonlinear behavior A behavior that changes in abrupt, nonlinear ways in response to systematic linear increases in the value of a specific variable (e.g., the change from smooth to turbulent water flow in a tube with a specific increase in water velocity; the change from a walking to a running gait with a specific increase in gait velocity).

Nonregulatory conditions Features of the environmental context that have no influence or only an indirect influence on movement characteristics.

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Observational learning Learning a skill by observing a person performing the skill. Also known as *modeling*.

Open-loop control system A control system in which all the information needed to initiate and carry out an action as planned is contained in the initial instructions to the effectors.

Open motor skill A motor skill performed in a moving environment where the feature of the environmental context in motion determines when to begin the action.

Optic chiasm The place near the base of the brain where the optic nerve fibers meet and either continue to the same side or cross over to the opposite side of the brain.

Optic nerve Cranial nerve II; it serves as the means of information transmission from the retina to the brain.

Optical flow The patterns of rays of light that strike the retina of the eye that emanate from and are specific to objects and features in the environment.

OPTIMAL theory of motor learning OPTIMAL is an acronym that stands for **O**ptimizing **P**erformance **T**hrough **I**ntrinsic **M**otivation and **A**ttention for **L**earning. The theory addresses issues that have been traditionally ignored by schema theory and the dynamical systems theory. It stresses that learning cannot be understood without considering the motivational and attentional influences on behavior.

Order parameters Functionally specific variables that define the overall behavior of a system. They enable a coordinated pattern of movement to be reproduced and distinguished from other patterns (e.g., relative phase). Known also as collective variables.

Organization When applied to a complex motor skill, the relationships among the components of the skill.

Overlearning Practice that continues beyond the amount needed to achieve a certain performance criterion.

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Parameters Features of the generalized motor program that can be varied from one performance of a skill to another. The features of a skill that must be added to the invariant features of a generalized motor program before a person can perform a skill to meet the specific movement demands of a situation.

Parietal lobe An area of the cerebral cortex that plays an important role in the control of voluntary movement, such as the integration of movement preparation and execution processes, by interacting with the premotor cortex, primary motor cortex, and SMA before and during movement.

Parkinson's disease A basal ganglia disorder caused by the lack of production of the neurotransmitter dopamine by the substantia nigra; the disease is characterized by slow movements (bradykinesia), a reduced amount of movement (akinesia), tremor, and muscular rigidity.

Perception-action coupling The spatial and temporal coordination of vision and the hands or feet that enables people to perform eye-hand and eye-foot coordination skills; that is, the coordination of the visual perception of the object and the limb movement required to achieve the action goal.

Performance The behavioral act of executing a skill at a specific time and in a specific situation.

Performance bandwidth In the context of providing augmented feedback, a range of acceptable performance error. Augmented feedback is given only when the amount of error is greater than this range.

Performance curve A line graph describing performance in which the level of achievement of a performance measure is plotted for a specific sequence of time (e.g., sec, min, days) or trials. The units of the performance measure are on the Y-axis (vertical axis) and the time units or trials are on the X-axis (horizontal axis). This curve is sometimes referred to as a *learning curve*.

Performance outcome measures A category of motor skill performance measures that indicate the outcome or result of performing a motor skill (e.g., how far a person walked, how fast a person ran a certain distance, how many points a basketball player scored).

Performance plateau While learning a skill, a period of time in which the learner experiences no improvement after having experienced consistent improvement. Typically, the learner then experiences further improvement with continued practice.

Performance production measures A category of motor skill performance measures that indicate how the nervous, muscular, and skeletal systems function during the performance of a motor skill (limb kinematics, force, EEG, EMG, etc.).

Peripheral vision The visual field outside the 2 to 5 degrees of central vision.

Plasticity Changes in neuronal activity in the brain that are associated with shifts in brain region activation; these changes are commonly associated with behavioral changes or modification.

Point-light technique A research procedure used to determine the information people use to perceive and identify coordinated human actions. It involves placing LEDs or light-reflecting material on certain joints of a person, then filming or videotaping the person performing an action. When an observer views the film or video, he or she sees only the points of light of the LEDs or light-reflecting markers, which identify the joints in action.

Positive transfer The beneficial effect of prior learning on the learning of a new skill or the performance of a skill in a new context.

Post-KR interval The interval of time between the presentation of augmented feedback and the beginning of the next trial.

Power law of practice A mathematical law describing the negatively accelerating change in rate of performance improvement during skill learning. Large amounts of improvement occur during early practice, but smaller improvement rates characterize further practice.

Practice variability The variety of movement and context characteristics a person experiences while practicing a skill.

Prehension The action of reaching for and grasping an object that may be stationary or moving.

Premotor area A cerebral cortex area located in the frontal lobe just anterior to the primary motor cortex.

Prescriptive KP A verbal knowledge of performance (KP) statement that describes errors made during the performance of a skill and states (i.e., prescribes) what needs to be done to correct them.

Primary motor cortex A cerebral cortex area located in the frontal lobe just anterior to the central sulcus; it contains motor neurons that send axons to specific skeletal muscles throughout the body.

Proactive interference A cause of forgetting because of activity that occurs prior to the presentation of information to be remembered.

Procedural knowledge Knowledge that enables a person to know how to do a skill; this knowledge typically is difficult to verbalize or is not verbalizable.

Proprioception The perception of limb, body, and head movement characteristics and the force and effort associated with muscle contraction. Afferent neural pathways send to the central nervous system proprioceptive information about characteristics such as limb movement direction, location in space, velocity, and muscle force.

Proprioceptors Sensory neurons located in the muscles, tendons, ligaments, and joints. These neurons pick up information about body and limb position and changes in position.

Psychological refractory period (PRP) A delay period during which a person seems to put planned action "on hold" while executing a previously initiated action.

Pupil The opening in the eye that lets in light; its diameter increases and decreases according to the amount of light detected by the eye.

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Qualitative augmented feedback Augmented feedback that is descriptive in nature (e.g., using such terms as *good, long*), and indicates the quality of performance.

Quantitative augmented feedback Augmented feedback that includes a numerical value related to the magnitude of a performance characteristic (e.g., the speed of a pitched baseball).

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Reaction time (RT) The interval of time between the onset of a signal (stimulus) and the initiation of a response (e.g., the amount of time between the "go" signal for a swimming sprint race start and the swimmer's first observable movement).

Recall test An explicit memory test that requires a person to produce a required response with few, if any, available cues or aids.

Recognition test An explicit memory test that requires a person to select a correct response from several alternative responses.

Regulatory conditions Features of the environmental context to which movements must conform if they are to achieve the action goal. They regulate spatial and temporal aspects of the movement.

Relative phase An index of the coordination between two limb segments or limbs during the performance of a cyclic movement. It is based on calculating the phase angles for each limb segment or limb at a specific point in time and then subtracting one phase angle from the other. Relative phase ranges from 0 (or 360 degrees), which indicates an in-phase relationship between the limb segments or limbs, to 180 degrees, which indicates an antiphase (or out-of-phase) relationship.

Relative time The proportion, or percentage, of the total amount of time required by each component of a skill during the performance of that skill.

Response time The time interval involving both reaction time and movement time; that is, the time from the onset of a signal (stimulus) to the completion of a response.

Retention test A test of a practiced skill that a learner performs following an interval of time after practice has ceased.

Retina The eye structure that lines the back wall of the eye; as an extension of the brain, it contains the neuroreceptors that transmit visual information to the brain.

Retrieval A memory process involving the search through long-term memory for information needed to perform the task at hand.

Retroactive interference A cause of forgetting because of activity occurring during the retention interval.

Rods One of two types of photoreceptors in the retina; they detect low levels of light and are important for peripheral vision.

Root-mean-squared error (RMSE) An error measure used for continuous skills to indicate the amount of error between the performance curve produced and the criterion performance curve for a specific amount of time during which performance is sampled.

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Schema A rule or set of rules that serves to provide the basis for a decision. In Schmidt's schema theory, an abstract representation of rules governing movement.

Sclera The firm, white capsule of the eye; we commonly call the anterior portion of it the "white" of the eye.

Segmentation A part-task training method that involves separating the skill into parts and then practicing the parts so that after one part is practiced, it is then practiced together with the next part, and so on. Also known as the progressive part method.

Selective attention In the study of attention as it relates to human learning and performance, the term used to refer to the detection and selection of performance-related information in the performance environment.

Self-organization The emergence of a specific stable pattern of behavior due to certain conditions characterizing a situation rather than to a specific control mechanism organizing the behavior; for example, in the physical world hurricanes self-organize when certain wind and water temperature conditions exist.

Sensory cortex Cerebral cortex area located posterior to the central sulcus; it includes several specific regions that receive sensory information transmitted via the sensory nerves specific to that type of information.

Sensory neurons Nerve cells that send neural impulses to the CNS. Also called *afferent neurons*.

Serial motor skill A motor skill involving a series of discrete skills.

Simple RT The reaction time when the situation involves only one signal (stimulus) that requires only one response.

Simplification A part-task training method that involves reducing the difficulty of specific parts or features of a skill.

Skill (a) An activity or task that has a specific purpose or goal to achieve, (b) an indicator of quality of performance, often referred to as "skill level."

Specificity of motor abilities hypothesis A hypothesis that maintains that the many motor abilities in an individual are relatively independent.

Specificity of practice hypothesis The view that motor skill learning is influenced by practice condition characteristics, especially the sensory/perceptual information available, performance context characteristics, and cognitive processes involved.

Speed-accuracy trade-off A characteristic of motor skill performance in which the speed at which a skill is performed is influenced by movement accuracy demands. The trade-off is that increasing speed yields decreasing accuracy, and vice versa.

Stability A behavioral steady state of a system that represents a preferred behavioral state and incorporates the notion of invariance by noting that a stable system will spontaneously return to a stable state after it is slightly perturbed; the influence on skill performance of perturbations, which are internal or external conditions that can disrupt performance.

Stimulus-response compatibility A characteristic of the spatial arrangement relationship between a stimulus and a response. This relationship includes the spatial arrangement of stimuli and the limb movements required to respond to them, and the physical characteristics or meaning of a stimulus and the type of response required. The degree of compatibility influences the amount of preparation time in a reaction time task involving stimulus and response choices.

Stroop effect A type of stimulus-response compatibility situation in which a color's name and ink are the same or different. RT for saying the word is faster when both are the same color than when the word is a different ink color.

Supplementary motor area (SMA) A cerebral cortex area located on the medial surface of the frontal lobe adjacent to portions of the primary motor cortex.

Symmetric transfer Bilateral transfer in which the amount of transfer is similar from one limb to another, no matter which limb is used first.

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Task-intrinsic feedback The sensory feedback that is naturally available while performing a skill.

Taxonomy A classification system organized according to relationships among the component characteristics of the group of items or objects being classified.

Terminal augmented feedback Augmented feedback that is provided after a person has completed the performance of a skill or a movement.

Transcranial magnetic stimulation (TMS) A noninvasive method of assessing brain activity that involves a short burst (referred to as a pulse) of a field of magnetic waves directed at a specific area of the cortex. This pulse of magnetic activity temporarily disrupts the normal activity in that area of the brain, which allows researchers to observe behavior when that area is not functioning.

Transfer-appropriate processing theory An explanation of positive transfer proposing that transfer is due to the similarity in the cognitive processing characteristics required by the two skills or two performance situations.

Transfer of learning The influence of prior learning on the learning of a new skill or the performance of a skill in a new context.

Transfer test A test in which a person performs a skill that is different from the skill that he or she practiced or performs the practiced skill in a context or situation different from the practice context or situation.

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Variable error (VE) An error score representing the variability (or conversely, the consistency) of performance.

Velocity A kinematic measure describing the rate of change of an object's position with respect to time. It is derived by dividing displacement by time (e.g., m/sec, km/hr).

Verbal cues Short, concise phrases that direct a performer's attention to important environmental regulatory characteristics or that prompt the person to perform key movement pattern components of skills.

Vigilance Maintaining attention in a performance situation in which stimuli requiring a response occur infrequently.

Visual field The image or scene being viewed; it typically extends approximately 200 degrees horizontally and 160 degrees vertically.

Visual search The process of directing visual attention to locate relevant information in the environment that will enable a person to determine how to prepare and perform a skill in a specific situation.

Visual selective attention The process of engaging vision in directing attention to specific environmental information (i.e., cues) that influences the preparation and/or performance of an action. It is selective because the specific cues attended to must be chosen from among other possible cues in the performance environment. The selective attention process may be active or passive.

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Working memory A functional system in the structure of memory that operates to temporarily store and use recently presented information; it also serves as a temporary workspace to integrate recently presented information with information retrieved from long-term memory to carry out problem-solving, decision-making, and action-preparation activities.