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Motor Learning

Basic Terminology:

Motor Skill- proficiency demonstrated when performing a movement
Cognitive skill- proficiency demonstrated when deciding how to execute an action
Motor Performance- result of performer completing a motor skill; can be impacted by variables such as fatigue
Motor learning-changes, which occur as a direct result of experience and practice
Verbal/cognitive stage- early stage of learning, establishing feel of movement, ore cueing, errors
Motor Stage- longest stage, focus is on refining skills, better organization of movement pattern
Automatic stage- fast processing, significantly reduced errors, correction, longer program sequences

Practice Structure:

Distributed practice- shorter duration, longer rest period in between
Blocked practice- Only one motor skill is practiced, with consecutive repetition of skill
Random practice- multiple skills are practiced in random order, consecutive repetition of same skill is reduced compared to blocked practice
Constant practice- learner only rehearses one variation of a skill (ie no change in volume, key, speed, range)
Varied practice- learner rehearses different variations of a skill during a given session, promotes flexibility and generalization of skill
Forgetting Hypothesis- producing random repetitions of various motor skills, non-consecutively allows the brain to forget, thus re-enforcing the learner to "regenerate" a solution to the motor problem each new time. This re-enforces retrieval of the motor program, facilitation retention and learning.
Desirable difficulties- tactic used during practice to force the learner to increase errors during practice in order to promote more cognitive processing during the acquisition phase of learning. Performance is typically decreased during acquisition but learning and retention is increased

Cueing & Feedback

Intrinsic- Exteroception (auditory, visual), Proprioception (movements of muscles and joints)

Extrinsic- sensory information coming from outside of the body (verbal cues, biofeedback) Teacher controls extrinsic feedback

Knowledge of results (KR)- Tells performer information about how close they came to the desired movement outcome. Can be redundant with intrinsic feedback. Learner must be able to provide own KR early in learning.

Knowledge of Performance (KP)- Tells performer something specific about the quality of movement produced

Internal focus-Learner focuses on movement within body when executing movement goal-may be useful in early stage.

External focus- Learner focuses on end result of movement (send tone across room), Reduced conscious processing. Promotes automatic learning- Switch to this early in skill acquisition