

MOTOR Notes Wed Aug 23 p1

Phoenix
Cryphon

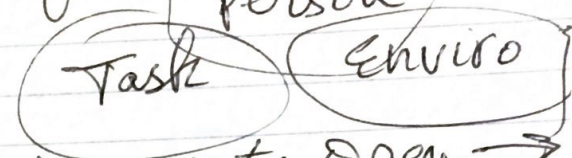
HWK
AUG 27

Picture
484
Assign
due
SUNDAY
night

- mvmt
- open enviro
- closed enviro
- discrete
- Serial
- Continuous tasks
- Stability
- mobility
- manipulation
- perception
- cognition
- action

MOVEMENT & MOTIVATION

- share the same latin root "movere"
- why is that important
- depression
- mvmt emerges from person



TASK

- Discrete • distinct
- beginning & end
- Serial • a series of discrete tasks strung together

Environment: Open → is constantly changing and unpredictable

closed is stationary and PREDICTABLE

mvmt can be planned in advance

8/23/17

Continuous • continues until person wants it to stop

Stability • purpose of task is to remain still

non-moving base of support

MOBILITY • purpose is to move your base of support

MANIP • to move something else

- Person = perception perceiving the relevant enviro + features, SENSE;
- Cognition = THINK what to do where, when achieve goal

VB serve
open
STABILITY
MANIP
Serial

BB
Continuous
MOBILITY
MANIP

would do it if you could
marathon
distinct S & E

ACTION
produce muscle activity to do that goal

misty Copeland
To match my strength is to feel your own

COGNITION/MOTOR ACTION
 MOTOR MAU028
 Phoenix, Oryphon

• MWK NEXT HW Sample
 • Sensory PERCEPTION
 Person discrete, serial, continuous tasks
 Task ENV Perception, Thinking, Action (Person)
 MOVEMENT MOTIVATION at center

How the brain & body comm
 wk 1 SPERCEPTION
 wk 2 INFO Processing
 wk 3 COGNITION & Motor Action
 wk 4 Review and Exam 1
 wk 5

Ascending PATHWAYS
 body to brain
 AFFERENT
 ± Sensory
 Descending
 brain to the body
 EFFERENT
 Motor
 produce MVMT
 L ⇒ R
 R ⇒ L
 brain body

temporal occipital
 hearing vision
 timing
 parietal
 all sensory
 multisensory
 perception
 somatosensory cortex (back)
 motor cortex (front)
 body + vision
 M/S

• homunculus
 diagram

MOTOR • MAug 28 Page 2 • Phoenix Cryphon
 A sensory info helps guide mvmt
 CNS PNS sense of perception

- E ↓
- how do perceived sensations lead to mvmt.
 - tactile
 - proprioception (where body parts are relative to own physical body)
 - visual
 - vestibular (head position in relation to gravity)
 - auditory
 - sensory/sensation = physical process when our organs respond to external or internal stimuli
 - perception = brains process of assigning meaning to the stimuli to make sense of the world around you

P = can change/be influenced by quality of stimuli in a given context, by past experience, by emotion or a host of other factors

Sensing
 Tactile chgs in pressure/temp skin
 Proprioceptive = stretch in muscles & mvmt in joints
 thick process not just taking in a scene, but simultaneously weighing its meaning, evaluating it, and generating an emotion about it

Meaning
 sharp/move, now.
 pen
 right amt of force to write

- MORALS = AESTHETICS = SENSUAL Perceptions
- you perceive with your mind
- feelings & sensations remember its all in your head

Interoception v. Exteroception

INT = perception of the internal environment, a sense that is stimulated from within body
 Pain = (nociception) hunger, horny, thirsty, tired, internal organs

Exteroception = perception of the outside world
a sense that is stimulated from outside body
vision, touch, hearing, smelling, tasting

I + E = perception of self is always connected
with the perception of the surroundings
= constantly perceiving properties of enviro
with respect to yourself

Sens = manip orientation of body in order to
Perceive = manip your surroundings
Real life = you have to know where you are
relative to where you are + where
you want to be

+ picking up a cup
+ brushing your teeth
+ showering
+ exercising
+ etc

INT what R hand feel
like
EXT how close are
you to
another
person

Consciousness =
what is the most
important thing
you're sensing
or perceiving? Why
are you more aware
of one sense over
another?

• Muscle
spindles
• detects
stretch
&
speed of
stretch

Sensation
what are your
sensing
Perception
what meaning
are you giving to
your sensations

TACTILE from skin about external enviro
receptors = fast or slow adapting
large field or small field
muscle spindles stretch
do free nerve endings = can detect temp,
mechanical stimuli (touch pressure stretch)
or danger (nociception)

• PPception
Golgi tendon organs - sense of grasping where you are
tendon tension where your body parts are in the
enviro

vision = info about enviro, moving objects
and your own MVMT.

8-28

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page 4

① Central vision = what we are
focused on
highly linked to consciousness
what is it

② Peripheral = subconscious awareness
where is it

③ How do we perceive 3-dimensional space
(know in 3D because of MVMT)

vision
example

see
outcomes
of MVMT

MVMT is key to realize world in 3D
staring at comp moves in periphery
now I'm looking toward the thing that
moved.

dorsal
pathway
(where)

OCCIP
LOBE

Ventral
pathway (what)

Motor MON

8-28-2017

inferior temporal
complex

Vestibular = cont on 8-30-17 Wed

484 Jamiroquai - Virtual Insanity / Phoenix
8-30-2017 wed motor / Cryphon
Vestibular System

Canvas Files week 2 sensory feedback ppt *

HWK Sensory Perception.doc • woman Fall.doc

Reflection Assignment #2 1pg } Next Wed Sept 6
Handwriting #2 1pg } HWK 484
(crystals)

each sensory thing was a paragraph

VESTIBULAR System = Hair Cells

8/30/2017

- semi-circular canals in inner ear
- provides info regarding the position of your head relative to the rest of your body
- sensitive to each plane of mvmt x, y, z
- plays an important role in balance
- Vestibulo-ocular reflex helps to coordinate the eyes when you move your head
- Golgi Tendon Organs = Tension
- Muscle Spindles = Stretch

Margin
Note

Auditory = Depending on the

Accel or Deceler
Acceleration

noise you hear, you might change the way you move

- Like if you hear something you perceive as dangerous, you will probably run away from that noise

- Rhythmic music & mvmt

- like exercising to music

- helpful for children and people with

- parkinson's or autism

Kinesthetic Sense = MVMT Sense

COMBO of PROPRIOCEPTION + vestibular

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Phoenix, Oryphon

Multi-Sensory Integration

MOTOR

Sensory Redundancy = decreases potential error
Receive INFO from MULT sensory modalities
and use the info to determine what to do next

what is the most salient (giving you most info)
biggest input / biggest stimulus

Auditory HEARING + VISION Ogle 0-3 years
"Keys" example to get kids to look L-R 8 old
Neck R.O.M. (CONS" Against Kids WTRW"
Tap on floor L-R Ex Phys = ? interview OGLE?
Encouraging other senses

PSA / Oculomotor Reflex = keep focus on
something that's moving
smooth pursuit
watching tennis Cat turn car before eyes

● Vestibular + Vision = focus eyes on something
while moving body around an environment

Car sickness while reading in car MISMATCH
Tactile into chair = Both moving
Vestibular = Both moving
Vision = says not moving

Decreased Vision
Best Blind Golfer in World Washington Post
Zohar Sharon = blind golfer
Shimshon Levy = eyes caddy
Auditory Assist

Paul Bach-y-Rita Vestibular Device Brain Port Device
Helmet Balance Device
Head Body Position
Translated to Tongue

open loop

can't use sensory

discrete tasks

find out how you did after

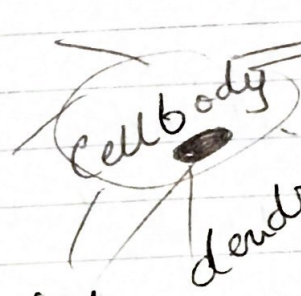
ABILITY

closed loop

use sensory to help guide movement driving

Phoenix Cryphon

Motor Memory = Neurons



AXON

Neuroplasticity
changeable
malleable
modifiable

nucleus

ability of brain to reorganize via learning - synaptic connections

"Nerves that fire together wire together"

Motor Cortex (M1)

Cerebellum

Basal Ganglia & Dopamine

temporal visual

amygdala • emotional

hypothalamus • body fx

premotor cortex - tell body how to move

Important Structures of Brain that control movement

Motor Memory

Basal Ganglia MVMT + REWARD

Dopamine is a NT that is found in the basal ganglia
Dopamine is released when you predict a reward

Cerebellum = only makes up 10% of T Brain Vol but contains ~ 50% of the neurons

VOL LIMB MVMT
EYE MVMTS
Balance

thinking
Higher Brain Functioning

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CRITICAL in TRIAL & ERROR adaptation
MTR - activity increases during limb MVMTs
Cortex - related to errors
"Tiara" - Ref of correctness
- cerebellum important in learning new thing

Transcranial Magnetic Stimulation Demonstration } MTR CORTX (M1)
- part of brain that codes for MVMT
- corticospinal tract
- synapses to motor neuron
- leading to physical MVMT

for:
which muscles to use
which direction the part of the body should go
how much force to apply

Neuroplasticity in M1 is how we retain motor skills AKA Motor Memory

- skilled movement is associated with changes in the MTR cortex

Motor Cortex retains what the Cerebellum learns

MTR Learning

1. We do a new task
2. Learn through TRIAL/ERROR
Compare expectations with reality
3. We continue to practice
4. Neuroplasticity = increased area of the motor cortex for the parts of the body necessary for the task
5. We become skilled - have motor memory

MOTOR
MEMORY