Sleep and Dreaming – January 23

I. ELECTROENCEPHALOGRAM (EEG) RESEARCH

Sleep is one of a number of _____ (circadian) cycles in the body; Regulated in part by _____, a photopigment; brain begins producing more around 8 pm.

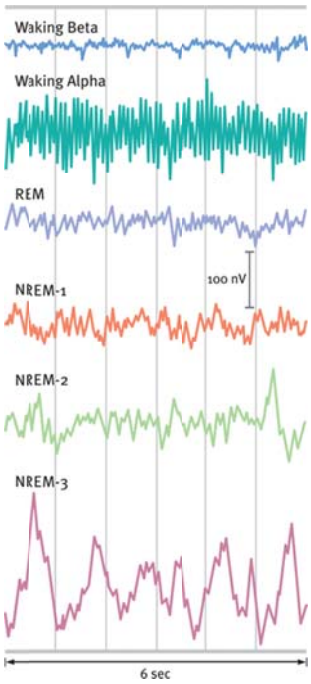
A. EEG research shows that there are cycles within sleep period.

Electrodes on the _____ record electrical activity of the brain (brain waves).

EEG recordings allow identification of _____states

Two broad classes are REM (rapid eye movements) and NREM (non-REM)

Figure 8.2



Awake: beta, _____, 15-30 cps

Drowsy: alpha, _____, 8-12 cps

REM: return of beta waves

NREM 1: theta, 4-7 cps,_____eye movements

NREM 2: sleep spindles occur

NREM 3: delta, 1-4 cps, high amplitude

NREM sleep is _____ sleep - physiological processes slow down; NREM 3 is also called _____ _____ sleep (SWS); difficult to _____ from this SWS.

REM sleep is _____ sleep. Also called_____ sleep-- the brain acts as if awake and physiological processes speed up but the sleeper is _____ (no muscle tone). The brain stem blocks signals from _____cortex to the body.

Also _____ sleep - most (& more) vivid dreams occur now about _____ report in lab studies.

B. Sleep Cycles: NREM to REM cycles last about _____ minutes in young adults

1. 1st half has more _____ sleep (_____)
2. 2nd half has _____ deep/SWS sleep but more _____.

Both NREM 3 and REM are needed – for each get _____ effects with selective deprivation.

II. SLEEP DEPRIVATION

A. How much sleep do you need? Answer = _____ _____

Class data and national data.

B. What are the effects of staying up all night?

Pilcher & Walters (1997) -- Recruited college students -10 pm Friday: randomly assigned to sleep or no sleep group; 10 am Saturday: assessed mood, self-rated ability to think, and critical thinking

Mood – _____ difference (note--meta-analysis does show small effect)

Ability to think – No sleep group significantly _____ ratings

Critical thinking test – No sleep group significantly _____ performance

After staying up all night, do you continue to get sleepier and sleepier as the day progresses?

More awake (less fatigue) during _____ hours.

Why? the normal _____ cycle.

C. What are the effects of long-term total sleep deprivation?

1. Randy Gardner - _____hours without sleep ; _____ catastrophic _____

sleepy, irritable, some disorientation, some slurred speech, especially after a week

Not typical. He was highly _____to show how well he could do.

2. Van Dongen et. al. (2003). Multi-day experiment with restricted sleep and no sleep groups. No sleep group showed increasing _____on memory and attention tests over three days. As in Pilcher & Walter study, the students did not realize how _____ they performed.

3. Rats kept awake in the lab _____ after _____weeks.

weakened _____ system, weakened ability to produce _____and to metabolize sugars

D. Sleep Restriction: less sleep over an extended period; a _____ condition

1. Class data.

The Maas (1999) scale shows _____ experiencing sleep restriction! (3 or more yes)

2. Similar symptoms: a. fatigue b. impaired concentration

c. _____immune system

d. _____ in accidents;

Study with doctors in residency -Driving simulator performance was as if had been _____.

3. Data described so far are _____.

Similar findings in _____ studies.

Data from Van Dongen et al. (2003) show increasing _____ and _____deficits.

III. SOME SLEEP DISORDERS

A. Insomnia—_____ difficulty falling or staying asleep; 25% _____ adults.

B. Narcolepsy - 1/2000: persistent daytime _____;

may produce sudden onset of _____sleep, including

loss of muscle tension; brains lack _____ that produce orexin, a brain chemical

Drug therapies for narcolepsy?: Stimulant drugs such as _____ - adverse side effects. Animal models may lead to better understanding.

C. Sleep paralysis - "_____" nightmare

Wake up but; _____ move; Heavy _____ on ribcage so feels like cannot breathe; feeling of threat from _____ presence/spirit/alien,

sometimes _____ but the experience seems very real to the person.

Long _____& across cultures. Not night terrors or nightmares. Associated with _____

D. REM _____disorder--a sleep disorder in which there is no _____ during REM. May act out part of dreams. Mostly males over 50. Also associated with some neurological diseases.

IV. WHY DO WE DREAM?

Class data on dreams.

A. Wish Fulfillment Hypothesis Sigmund Freud--<u>The Interpretation of Dreams</u> (1900)

Unacceptable wishes/desires hidden from consciousness _____ in dreams

_____Content; remembered story line; _____Content; Hidden or underlying meaning; expressed in _____ needed interpretation by analyst.

But there were some common symbols

Interesting, but no _____ support

B. _____-Synthesis Theory (processing neural static)

Dreams are side effects of the fact that the brainstem sends _____to cortex

Why? activate or "_____" because no _____ input

Human (mammal?) cortex tries to make _____ of (interpret) (text: Make sense of static)

Also might incorporate current _____ events.

Dreams have no_____ meaning - simply by-products of brain activity

C. Information Processing Perspective

Consolidation/strengthening of _____ traces; newest version is Ribeirio (2003) .

SWS and REM work _____; SWS reinstates brain activity to _____ stimuli;

During REM, memory _____ processes occur.

Problem solving is an information processing view focusing on day residue _____, which is common. Allows more _____thinking to find solutions.

Freudian wish fulfillment, creative problem solving, strengthening memory (learning), activation synthesis (by product)—which offers the best description? _____ go with all but the first. College students choose _____: Sigh ☺

PERCEPTION—CONSTRUCTION OF REALITY – Jan 25

I. REALITY?

A. Object under normal light and under infrared light. They look _____.

Which reflects _____?

B. WE SEE THINGS NOT AS THEY ARE, WE SEE THINGS AS _____ _____

CHINESE FORTUNE COOKIE

Discussion of Figure 18.25 from text

II. SENSATION vs. PERCEPTION

A. Some Terminology: the distal stimulus and the proximal stimulus and the percept

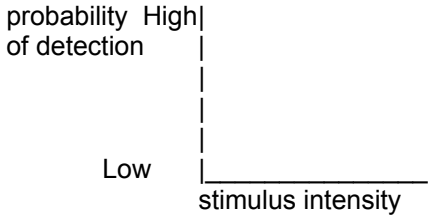
1. _____ stimulus - thing/event that exists in the real world.
2. _____ stimulus -pattern of sensory information sent to the brain.
3. _____ - interpretation of the proximal stimulus. What is perceived or experienced by the person.

B. _____is constructed from sensory input (_____ processing) and prior knowledge (_____ processing)

III. SENSATION

A. _____ sensory threshold -minimal amount of energy needed for detection.

B. Not _____ (all-or-none). Function is ogival (_____ -shaped).



1. Absolute sensory threshold is intensity needed to detect _____of the time.

_____ is below this point.

C. Difference threshold -- the amount of _____ in intensity needed to be detected 50% of the time.

1. ___ust ___oticeable ___ifference (_____)
2. Weber's fraction or Weber's constant : $\frac{\text{\_\_\_\_\_ in intensity}}{\text{current intensity}} = \frac{\Delta I}{I}$ = a constant
3. If current intensity is _____, _____change is needed to detect

IV. PERCEPTUAL ILLUSIONS

Perceptual illusions illustrate the fact that Perception is _____.

REAL World: a 3D _____stimulus gives a 2D _____stimulus and a 3D _____

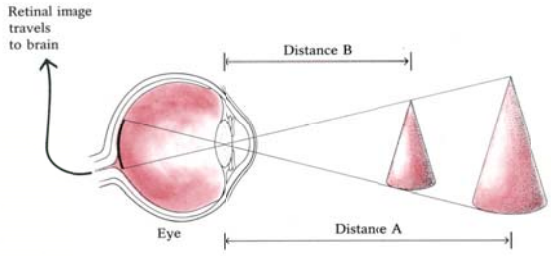
Perceptual illusions: _____ distal stimulus gives a _____ proximal stimulus and a _____ percept

Types of depth cues. Monocular vs. binocular depth from text. Picture on slide shows depth from the monocular cues of linear perspective and shadow.

A. Illusions based on _____ perspective/ _____ distance

1. Ponzo illusion

Apparent _____: If two objects produce the same size _____ image, and one is perceived as farther away, it is also perceived as _____.



(Emmert's law)

Cylinder illusion

Muller-Lyer illusion

B. Illusions based on shadow

1. convex and concave -- visual system uses shadow to infer _____of light source, and this affects perception
2. visual system "adjusts" for _____brightness difference

V. GESTALT PSYCHOLOGY

Early 20th century German psychologists- Perception is more than assembling _____

The whole is greater than the sum of its parts.

Perception is not passive. It is _____

Gestalt grouping, p. 233

A. Figure – ground: organization of the visual field into objects (_____) that stand out from their surroundings (_____)

1. Reversible figure and ground- Same stimulus contains more than one _____

a. faces and vases b. Escher figure

Whichever is “attended” is _____; Figure portion is _____ and more _____ than ground

B. Perceptual system built to find good _____ (figures or forms).

1. Necker Cube--Sometimes there are _____ good gestalts in one stimulus.
2. Impossible figures. Sometimes there are _____ (no good figures)

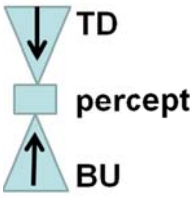
VI. TOP-DOWN versus BOTTOM-UP INFLUENCES

A. Discriminating between them

1. Top-down (TD) information- expectancy, goal, & _____ knowledge; (information "in the _____")
2. Bottom-up (BU) information- distal/proximal stimulus; (information "in the _____")
3. Perception – constructed from _____.
4. Percept = _____ = (expectancy & knowledge) +(proximal stimulus)
5. TD and BU operate in _____.

B. Context is _____

1. It can disambiguate a stimulus: Examples: 13/B; THE CAT, INK BLOTS, event/went
2. Normal perception is _____because TD+BU work _____



Expectancy and the stimulus inputs converge on the same _____.

3. Because TD _____ to BU to produce the percept, if expectancies are wrong, TD can lead to _____.

	loaf of bread	mailbox
Palmer (1975) study	correct response	wrong similar response
no context (no TD)	_____	_____
appropriate context (correct TD)	_____	_____
wrong context (wrong TD)	_____	_____

Hunting accidents and mistaking and object for a gun can occur when TD expectancy _____ effects are strong. Just as in the lab, in the _____ _____, Expectancy strongly affects what we perceive.

C. Degraded stimul

1. Degraded Stimulii: _____ is incomplete

   Perception is _____.

   DOG

   COW

2. Degraded stimuli: _____ is missing.

   How effortful is it to understand this story?

   Now that you have some _____ (TD) how effortful is it?

D. Recap and Take Home Message: Perception is effortless in most cases because TD and BU converge _____ on the same percept.