

PS102-Psychology

Lecture Notes

Tuesday, January 7th 2020

Humanistic Psychology

- Optimistic view of humans
- Self-actualization
- Uniqueness
- Rogers-Key phase
- Maslow

Cognitive Psychology

- Acquisition retention and remembering info
- Reasoning and problem solving

Neuroscience

- Biological foundations
- Brain evolution

Psychoanalytic

Why the Iceberg?

- Conscious vs unconscious mind
- Conflict between conscious and unconscious
- Pleasure, reality, moral
 - Ego is the Human
 - Pleasure=ego(devil)
 - Reality=human
 - Moral=Superego(angel)
- Many foundations set in childhood
- Impacts:personality, moral development, mental illness
- Evaluation: theory does not hold-shortened therapy still practised



Behaviorism

- Examined processes by which experiences influence behaviour
- Discovered laws of learning that apply to virtually all organisms

Behaviour and Learning

Classical or Operant?

- Operant Conditioning
 - Learning through consequences

Thorndike's Law of Effect

- "Satisfying" consequence: more likely to occur

- “Unsatisfying” consequence:less likely to occur

Skinner

- Assumes behaviour voluntarily, under our control we have to emit a behaviour, “operate” on the movement on the environment, then associate behaviour with a positive or negative outcome
 - Reinforces increases likelihood of a behaviour
 - Punishers suppress behaviour

| | Reinforcement | Punishment |
|----------|---|--|
| Positive | -increase behaviour -Add to environment -candy,smile,art | -decrease behaviour -Add to environment -slap,shout |
| Negative | -increase behaviour -remove from environment -buzzer,pain | -decrease behaviour -remove from environment -time out, no t.v |

Social Learning

- Bandura
- Bobo Dolls
- Learn through observation

Lecture 2

Jan 9, 2020

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The science of psychology

Methods of study:

- Observation
 1. Naturalistic
 2. Case study (genie)
 3. Laboratory

Limitations of descriptive methods

- Naturalistic observation
 - Have to wait for an event to happen
 - Observer bias
- Laboratory observations
 - loss of spontaneity
 - (same as above)

- Case studies
 - Limited sample size, low generalizability
 - Observer bias
 - Hawthorne effect
 - No cause and effect

Research question:

- Experiment (conditions experimental/control)
- Cause and effect
- hypothesis
 - Does multitasking with technology (off task) in class reduce grades?
 - Do mothers and fathers engage equally in gender stereotyped play with their preschoolers
 - Does answering 'why' questions while studying from text improve grades?

The experiment: Variables

- Independent - what is being manipulated - experimenter controls
- dependent - what is being measured
- extraneous

Design considerations

- selection bias (cure; random selection/assignment)
- Experimenter bias (cure: double blind)
- Placebo (cure; exposure control group)

Experimental analyses

- data
- basics;
 - Mean- 2,7,1,3,2= 5 -average (added and divided)
 - Median- 1,2,2,3,7=2
 - Mode =2 - frequently occurring

Data basics:

- measure of central tendency
- uses stats such as mean, the range (1 to 7, 6 points) and the standard deviation (scores vary)

Not everyone gets the same score

- Expect a distribution
- Normal distribution (bell shaped)
- 1. Half the people in this country are below average in intelligence”
- Measure variability
- Variability- tells how spread out scores are from the mean

Lots of variability

-wide and flat

Little variability

-All the scores are close to the mean

- Standard deviation is an index score- based on the distribution
- Tells where, in relation to mean a particular score falls

Experimental tests

- Use the mean and standard deviation
- Look for diff in the means and standard deviations (variability) in scores for each condition

What statistical test is used?

Two groups: comparing the mean scores= **t-test**

Mice fed rice versus mice fed grain

More than two groups: comparing mean scores= **F-test**

-mice fed rice versus mice fed grain versus mice fed chocolate

What is a correlation?

- Involves measuring and determining the relation between two variables
- Co-relation- relation of two things
- Eg; shoe size and height

Kinds of correlations

- Positive-up and up
- Negative - up and down
- Spurious- no correlation

Other important correlations:

Happiness and helpfulness - pos correlation

Smoking and cancer/smoking and SIDS - neg correlation

Strength of correlation

- Correlation coefficient: r
- The positive or negative sign reflects type not strength
- 0-1=positive
- -1 to 0 +negative

So which is the stronger correlation?

- Close to 1 is the stronger correlation

Ex: r=3, r=-8, r=-2, r=7

Answer: -8 CAUSE ITS CLOSEST TO 1

Lecture 3

Jan 14th 2020

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Why Correlation Studies?

- Because you can have access to two pieces of information but may not be able to manipulate the variables
- Often the first step in the inferential process

Framing Correlation Question

- A newspaper article suggest that “Ice Cream Consumption Leads to Murder”
- Is this a positive or negative correlation?
 - *Positive* → because two things are increasing

Inferential Statistics

- Used to test hypothesis
- Lots of different tests selected on the basis of the characteristics of the study (compares mean scores)
 - e.g t-test(2 mean score), f-test(more than 2 scores) etc
- Try to determine if the results are due to chance or not (null hypothesis)
- probability statice “p” → $p < 0.5$
- Statistical significance-significant or not, significant reliable, not “important”

Sensation and Perception

- Sensation is the process through which the senses detect visual, auditory, and other stimuli and transmit them to the brain
- Perception is the process by which sensory information is actively organized and interpreted by the brain
 - e.g your visual blind spot
- Sensation gives us the visual cues
- Perception fills in the blanks
- Sensory transduction=converting information in environment into neural impulses

What can we sense?

- How much stimulation does there have to be in the environment to detect that it is there?

Thresholds

Explains how much we need to detect something

- Absolute Threshold

- Difference between not being able to perceive something and being able to just barely perceive it
- The minimum amount of sensory stimulation that can be detected 50% of the time
- Nothing versus something
- Difference Threshold
 - The smallest increase or decrease in a stimulus that is required to notice a difference
 - Called the “just noticeable difference” (JND)
 - Difference that is detectable 50% percent of the time

JND in the Real World

- Radiology example
- Radiologists have to detect the JND to determine illnesses



Inequality Thresholds

- Variation across senses
- Book-absolute
- weber/fechner
- For JND

Weber Fractions for Various Sensory Modalities

| Sensory Modality | Weber Fraction |
|----------------------------------|----------------|
| Audition (tonal pitch) | 1/333 |
| Vision (brightness, white light) | 1/60 |
| Kinesthesia (lifted weights) | 1/50 |
| Pain (heat produced) | 1/30 |
| Audition (loudness) | 1/20 |
| Touch (pressure applied to skin) | 1/7 |
| Smell (India rubber) | ¼ |
| Taste (salt concentration) | 1/3 |

Sensory Adaptation- "Not Sensing"

- Become less sensitive to unchanging sensory stimulus over time
- Automatic process
- Allows us to shift attention

Perception-Understanding Sensory Input

There are 2 kinds of processing functions

1. *Bottoms-Up Sensory*
 - a. Individual components of stimulus detected by sensory receptors
 - b. Bits of information transmitted to areas of the brain to be combined and assembled into a unified whole
2. *Top-Down Sensory*
 - a. Past experience and knowledge influence our own perceptions
 - b. We find meaningful links between the individual links between the individual elements then by our own sensory receptors
 - c. Use existing knowledge, concepts, ideas, and expectations
 - i. *Top-Down Influences-perceptual set:* where individuals expectations affect their perceptions.
 - ii. Can be good-efficiency
 - iii. Can be bad-error/limit interpretation

Chemical Senses- Smell and Taste

- Chemical sense
- Rely on chemical molecules not a form of 'energy'

Anatomy of Smell

- Olfactory epithelium
- Olfactory receptor neurons
- Olfactory bulbs

Smell/Olfaction

- Receptors line upper nasal cavity
- About 40 million receptors
- Reception sites resemble neurotransmitter binding site
- Odour molecules (odourants) "lock" into certain sites
- Action potential
- Receptors send messages to the olfactory area in the brain
- Linked to the amygdala(emotion)
- hippocampus(memory)
- Available early/prenatal(but airborne?)

Smell and Taste are Complementary

- Chemical receptors/sensation-independent, perception-can interact

Taste Sensation

What do we do when we refer to taste?

- Chemical receptors=taste buds-consist of several receptor cells
- About 9000 taste buds grouped in different regions
- Located on the edges and top of tongue
- Thalamus
- Prenatal-childhood move

Sense of Taste

- Taste sensation are:sweet,sour, salty, bitter, and umami
- Papillae are small bumps on the tongue that contain taste buds

Lecture 4

Jan 16 2020

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Taste Flavor Gustation

Influenced by

- appearance/palatability
- Texture

- Previous experience
 - Gotten sick from a certain type of food

Vision

- Precursor-light
- We cant see an object of any type unless light is reflected from or given off by it

The Eye

- Cornea
- Lens
 - accommodation
- Retina
 - Images are inverted on their way to the retina at the back of the eye
- Rods
 - light/black/white grey
- Cones
 - colour
- Fovea
 - Detail
 - You're using your fovea when you are doing something that involves intricate detail
- Optic nerve
 - Optic nerve is where information is sent back to the brain to be scanned and coded
 - Blind spot
 - Optic nerve information has a partial cross

Vision →Color

- Perceive small part of electromagnetic (EM) spectrum
- Light waves measured in namo
- 400-700 visible light

Ask a Psychologist?

- Can dogs see in color?
 - Dichromatic rather than trichromatic

3 Dimensions of Color Vision

- **Hue** is the specific colour perceived wavelength
- **Brightness** refers to the intensity of the light energy that is perceived, amplitude of wave
- **Saturation** refers to the purity of a colour

Theories of color Vision

Trichromatic theory(young-helmholtz)

- Three types of color receptors
- Cones most sensitive to blue/purple,green, red wavelengths
- Visual system combines activity from these cells
- Colors are perceived by additive mixture of impulses
- If all are equally activated-white color is produced

So What's Going on With Trichromatic Theory?

- Trichromatic theory cannot explain
 - Red-green color blind individuals should not be able to perceive yellow
-----($\text{red} + \text{green} = \text{yellow}$)
 - Afterimages
 - Stare at red-look away you'll see green(same for blue and yellow)

Theories of Color cont.

- Opponent process theory(Hering, 1870)
 - Three cone types
 - Each responds to two different wavelengths-opposing pairs
 - Red or green
 - Blue or yellow
 - Black or white
- Explains Afterimages
 - Stare at certain colour
 - Neural processes become fatigued
 - Have 'rebound' effect with receptor responding with its opponent

Current View of Color Vision

Dual Process Theory

- Combines trichromatic and opponent-process theories
- 3 types of cones sensitive to short(blue) medium(green) and long(red) wavelengths
- These cones stimulate opponent-process reactions
- Opponent processes occur in ganglion cells, neurons in relay stations and visual cortex

Perception and vision: Gestalt Principles of perceptual Organization

- Figure ground
- Similarity
- Proximity
- Continuity
- Closure

Figure Ground

- Simplest form of organization

- Have foreground and background
- Figure
 - Distinct shape
 - More striking
- Figure-ground distinction can be ambiguous
 - The idea behind camouflage

Gestalt Principles

- Similarity
 - Similar items belong together
- Proximity
 - Elements close together belong together
- Closure
 - Close open edges; perceived boundaries, fill in gaps
- Continuity
 - Elements linked to form a continuous line, pattern

Lecture 6

Thursday Jan 23

PS-102

Knowledge Impacts Perceptual Constancies

Recognize Stimuli Under Various conditions

- Size
- Shape
- Brightness

Constancy

- Size constancy
- Shape constancy
- Brightness constancy

Depth Perception

- Image on the retina is 2 dimensional
 - But we live in a 3 dimensional world
- Monocular Depth Cues
 - Visual depth cues perceived by one eye alone
- Binocular Depth Cues
 - Depth perceived with 2 eyes
 - Visual depth cues that depend on both eyes working together

Monocular Depth Cues

- Interposition-when one object partly blocks view of another, perceive partially blocked object as farther away

- Linear perspective-parallel lines known to be the same distance apart appear to grow closer together, or converge, as they recede into the distance
- Relative size-larger objects [perceived as being closer, smaller objects as being farther away
- Texture gradient-near objects appear to have sharply defined textures, objects seem smoother and fuzzier as they recede
- Shadow or shading-when light falls on objects, it casts shadows. Can distinguish bulges from indentation by the shadows they cast
- Motion parallax-when riding in a moving vehicle--look out the side window
 - Objects closest to you appear to be moving faster than those at a distance
 - Objects very far away, such as the moon and the sun, appear to be stationary

Binocular Disparity

- Based on binocular disparity
 - 2 eyes receive different visual images
- Convergence
 - Feedback from ocular muscles when focusing on something distant and then close

Hearing-Audition

Characteristics of Sound

- Stimulus for hearing=sound waves
- Described by 2 characteristics
 - Frequency
 - # of cycles per second(Hz per second)
 - Related to the pitch of the sound we hear(2000 to 5000 Hz, sweet spot)
 - Amplitude
 - Amount of compression and expansion of molecules
 - Related to loudness we perceive
 - Measure in decibels
 - Normal conversation about 65db; rock band about 120 db

The Human Ear

Outer Ear

- Pinna
 - Part you use for earrings and sunglasses
- Auditory canal
 - Sound enters the auditory canal
- Eardrum
 - Causes the tympanic membrane to vibrate

Middle

- Ossicles
 - Vibrations cause malleus, incus, stapes (3 tiny bones) to vibrate
 - Amplify sound more than 30x

- Cause oval window to move in and out

Inner

- Cochlea
 - Contains cochlea
 - Houses basilar membrane-which moves as oval window moves(fluid)
- Hair cells
 - Contains hair cells=sound receptors
 - Hair cells synapse with auditory nerve
 - Send impulses to auditory relay station thalamus-then to auditory cortex(temporal lobe)

Tonotopic

- Organized of auditory cortex
- Parts of the cochlea map to parts of the cortex

Theories of hearing

- Place theory-each individual pitch is determined by the particular spot or place along the basilar membrane of the cochlea that vibrates the most
- frequency/temporal theory-hair cells receptors vibrate(action potentials) the same number of times per second as the sounds that reach them

Our current Understanding

- Both theories have flaws and both have some merit
- Blend of the two is accepted now

Sound Location

- Binaural hearing (2 ears) helps localize sound
- Timing of sounds
 - Sounds arrive at closet ear first
 - Use difference in arrival time
- Intensity of sounds
 - Sound arriving at closest ear will be more intense
 - Use differences in intensities

Hearing Loss

- Conduction deafness
 - Involves mechanical system of hearing
 - E.g punctured eardrum, loss of function of bones of middle ear
- Nerve deafness
 - Involves damaged receptors/nerve
 - Exposure to loud sounds can damage hair cells

Tactile Skin

- Skin is the largest organ in the body

- Contains variety of receptor structures

Sense of touch

- touch/pressure, pain, warmth, cold
- Receptors send messages to the brain
- Thalamus and somatic-sensory cortex
- Pain
 - Gate control theory
 - Fast and slow pathways
 - Block
 - Spine-now brain

Lecture 7

Jan 28, 2020

Developmental Psychology

Examines;

Changes in biological, physical, psychological, and behavioural processes as we age.

The big questions:

-critical and sensitive periods

- Critical period= age where experiences MUST occur
- Sensitive periods= optimal age range

-Nature and Nurture

- Is it the environment or heredity

-continuity versus discontinuity

- Gradual or stages?

Stability versus change

- Do things remain constant?

Visually Mapping Change:

A.) No change

-remains constant

B.) Continuous

-gradual change

C.) Stages

-discontinuous changes

D.) Inverted U-shape

-emerges early- peaks- diminishes with age

E.) U shape function

-emerges early- disappears - re emerges

Research designs

Longitudinal

- Test the same cohort (same group of people) at diff times, or long period of time

Longitudinal pros and cons

- Same people (reduces variability across samples)
- Real conclusions about development
- Time consuming
- People drop out
- Generalizability (all people? Just this group?)

Cross sectional

- Compare diff ages at the same time

Cross sectional pros and cons

- Pro: Data from many age groups
 - fast
- Con: cohort effects
 - diff experiences, cultural changes, environmental changes

Eg; ipad, cloud now prevalent

Sequential (cohort - sequential)

- test several cohorts as they age
- pros and cons of both longitudinal and cross sectional

Building blocks of development

conception:

mother= 23 chromosomes

father= 23 chromosomes

Genotype and Phenotype

What you are and what we see

- genetic blueprint and genetic expression

Genotype

- actual genetic "instructions"
- "Blueprint"

Phenotype: a trait we can observe- like eye colour

Genetics underlie what you see

- Chromosomes- strands
- Alleles- genes that align
- Homozygous (same from both parents)
- Heterozygous (diff from each parent)
- Dominant - recessive

Prenatal development

3 stages

| |
|---|
| Germinal stage(2 weeks) -zygote (about 1 week) Blastocyst attaches to the uterine wall (placenta) |
| embryonic stage 2nd- 8th week Placenta and umbilical cord develop- basic systems |
| Fetal stage Begins at 9th week Refinement, growth Brain development |

Sex determination

23rd chromosome= X or Y

Females = XX males =XY

Y chromosome stimulates Testes

Determination Factor

- Initiates development of testes
- Testes secrete androgens

Critical period = 6-8 weeks

- Insufficient androgen activity = ovaries

Negative Impacts prenatal

Environmental influences

- Teratogens: environmental agents that may cause abnormal development

Maternal Malnutrition

- Miscarriage, premature birth, still birth, impaired brain development

Maternal stress (stress hormones)

- Premature birth, infant irritability, attentional deficits

The newborn

- Comes Equipped to survive and learn
- Hear, smell, taste, touch, see (somewhat)
- Communicates

How do we know when a newborn “knows” something?

- Habituation- repetitive exposure
- Preferential looking
- Evoked potentials

What can the newborn do?

- Can discriminate diff speech sounds
- Can acquire classically conditioned responses
- Can do simple observational learning
 - Imitate adult facial expressions

Physical Development

- Maturation

-biologically programmed

- Cephalocaudal principle
- -development proceeds from head to foot
- -head is large - growth proceeds

Physical development continued

Proximodistal principle

-development proceeds from innermost to outer

-arms before fingers

Lecture 8

Jan 30

Motor Development

Motor Development

- Reflexes
 - Innate behaviours
- Most skills follow stage-like sequences
 - Age of acquiring skill varies
 - Sequence does not
 - Some have u-shaped function
 - Stepping reflex (moro)

Cognitive Development

- **Piaget**
- Children are not “adults in miniature”
 - Thinking changes “qualitatively”
 - Natural-born “scientists”
 - Actively explore and seek to understand their world
- Said you think in fundamentally different way when you get older
- Stage theorist
- Piaget's Stage Model
 - Brain builds schemas to achieve understanding
 - Schemas are modified to create equilibrium between environment and understanding
 - Equilibration
 - *Assimilation*
 - New experiences incorporated into existing schemas
 - *Accommodation*
 - New experiences cause existing schemas to change
- **Sensorimotor Stage**
 - Birth to 2 years
 - Understand world through sensory experiences/physical interactions with objects
 - Begin to acquire language
 - Object permanence: understanding that objects continue to exist even when they can no longer be seen (about 8 months)
- **Preoperational Stage**
 - Ages 2-7
 - World represented symbolically through words and mental images
 - Symbolic thinking enables pretend play
 - Child does not understand conservation
 - Thinking displays irreversibility, centration, animism, egocentrism
- **Concrete Operational Stage**
 - Ages 7-12
 - Easily perform basic mental operations involving tangible problems and situations
 - Often have difficulty with problems that require abstract reasoning
- **Formal Operational Stage**
 - Develops around 11 or 12
 - Can think logically about concrete and abstract problems
 - Able to form and test hypotheses

- **Information - Processing Approaches**

- Development is continual and gradual
- Not stage-like
- Cognitive growth occurs as information processing abilities gradually become more efficient
- As children age:
 - Information search strategies improve
 - Information processing speed quickens
 - Memory capabilities improve
 - Metacognition develops

Lecture 10

Thursday February 6th 2020

PS-102

Memory: A Primer

What is Memory?

- Cornerstone of cognition
- Required for most higher-order function
 - Problem solving
 - Reading
 - Language

Caveat

- Limitations and vulnerability

A Model of Memory

- Three processes
 - **Encoding** - get it in
 - Acquiring information
 - Detect the information(the code) and prepare it to be placed in memory
 - Code can be sound pattern,letter sequence, image,tactile cue,smell etc
 - Translated into neural code
 - **Storage** - keep it in
 - Encoded information has to be retained
 - Has to be a memory trace
 - **Retrieval** - getting it out
 - Accessing memories
 - Try to remember what was stored
 - Recall
 - RecognIOTN

Sensory Register/Memory

- Holds raw sensory input
 - Iconic stores-visual information
 - Lasts a fraction of a second($\frac{1}{4}$ of a second)
 - Echoic stores-auditory information
 - Lasts 2 seconds

Short Term Memory Function

Purpose and Function

- Conscious awareness
- Integrate information
- Temporary working area
- Hold current plans-strategies

How is information represented?

- Mental representation/memory codes
 - Various forms
 - images(visual)
 - sounds(phonological)
 - meaning(semantic)
 - Physical action(motor)
 - Form of memory code does not correspond to form of original stimulus

Short Term Store

- Capacity
 - Magical number= 7 ± 2 (miller, 1956)
 - Five-nine meaningful items
 - Adults
- Digit span task
- You must work on the information in order to remember it or you lose it

Duration

- rehearsal(default strategy), other strategies to hold onto information
 - Phone numbers
- Chunking-grouping information (meaningful units work best)
 - Chunking task

Short Term/Working Memory

- Shelf-life of 20 seconds for information
- Rapidly lost unless we actively 'do something' with it

Information Being Lost from STM

- Information missing in action

- Serial position effect exceeds capacity primacy and recency effects
- Forgetting
 - Not encoded
 - Decay- degeneration of the memory trace over time
 - Displacement-new information takes the place of old information

Working Memory

- Two slave systems
- Allow for two forms of non-competing information to be “worked on”
- Buffer to get information to long term memory

Long Term Memory

- Vast and permanent
- Knowledge of all our experiences, information and strategies
- Your brain can never be full
- You will never exceed capacity
- Children and adults always have enough “space”

Executive

- Controls flow of information
- Coordinates systems
- Higher-order functions
 - (strategies, metamemory)

Problem with the System

- Bottleneck
 - Short term is at the neck of the bottle
 - Long term is at the bottom of the bottle

Tuesday, February 25th,
Lecture 13
PS102

Language and Thought

Properties of Language

- Symbolic
 - Symbolic system (written and sound)
 - We adopt sounds from other languages
- Creative
 - Effortlessly create new sentences

- Have finite vocabulary can be combined in infinite ways
 - Ex. Wanna go out for dinner?
 - Wanna grab a bite?
 - Would you like to dine out?
 - Let's eat out?
- Structured
 - Although creative-there are some restrictions
 - These are regularities of language(not necessarily grammar rules)
 - E.g can end a sentence with a preposition and be understood, can't say "dinner the"
- meaningful/semantic
 - Each word represents an idea
 - Object (cat or dog). Action (bites)
 - Grammar structure also contributes to the ideas
 - Dog bites cat OR cat bites dog
- Communicative
 - Some language is private-for ourselves
 - Most language is directed at and around others, social activity
 - Need to know the sounds, words, sentences of language AND principles of conversation

Conversation: Pragmatics

- Knowing how to communicate the message effectively
 - Volume,inflection, gestures
- **Socio Pragmatics** - knowing how to speak to whom
 - Child, loved one, stranger, employer, enemy, expert

Structure of Language

Building blocks

- Phonemes
 - Requires sounds
 - Sounds require physiological structures
 - Smallest units of sound recognized as separate in a given language
 - Do not correspond to letters of alphabet
 - Meaningful perceptual units
 - Humans can produce hundreds of phonemes
 - No language uses all
 - About 40-44 phonemes in english
 - Other languages may have different numbers

Morpheme

- Fundamental unit of meaning
 - Combination of phonemes
 - English : 40ish phonemes: more than 80,000

- Morphemes for the average person
- Morphemes form words
 - Some are single syllable words (hat, bat)
 - Some are single letters

Syntax

- Grammar rules

Thurs, Feb 27 2020

Lecture 14

PS102

Language Structures-Surface Structure

Structure and Meaning

- How you phrase, gives the meaning
 - I saw a man on the hill with a telescope (phrase)
- Ambiguity-when the underlying proposition is not clear
 - Smoking volcanoes can be dangerous
 - Visiting relatives can be boring
- Word level ambiguity: We saw her duck

Language Development

- infant/child has to select out the sounds relevant to language from other vocal sounds in the speech

Prelinguistic

- Crying
- Coing
- Babbling
- All international
- Special case?
- signers

One-Word Stage

- Holophrastic - one word
- Many meanings

Holophrastic Errors

- Overextensions
 - word is used too liberally
 - Specific word applied to things it should not
 - daddy=man

- Underextensions
 - General word but child restricts to specific cases
 - drink=juice only

Two-Word

- Telegraphic - basic sentences
 - Demands ; come daddy
 - Questions
 - Possession
 - Statements

More Complex Speech

- Preschool complex speech
 - Full sentences, some grammatical flaws
- Overregularization
 - English past tense and plurals
 - U-shaped curve
 - Plurals : crow, ow

Preschool Complex Speech

- Overregularization
 - English past tense and plurals
 - U-shape curve

Metalinguistic Awareness

- Growing appreciation of ambiguities, playing with words

Behaviorists

- Learn through direct reinforcement/punishment
- Imitation - observational learning
- Shaping
- Problems - doesn't explain creativity in utterances or errors in speech

Nativists

- Biologically and physiologically equipped for speech and language
- LAD
- Critical period : most proficient at learning a language between 2 and puberty

Nativists : Limitations

- Questions not completed as early as nativists thought (adult can learn, and so so effectively)
- Diversity of world languages and grammars hard to explain
- Account of grammar and its development is limited

Interactionist

- Language is learned/used in a social context
- Biological contribution supports language learning

Animals and Language

- Communication vs. Language

Kanzi

- Bonobo Chimpanzee
- 1980 born, 500 words-lexigrams

KOKO

- Gorilla
- 46 years old/2018
- 1000 signs
- Internet chat

Keep pets

March 3

Lecture 15

PS-102
