Memory

The cognitive processes of encoding, storing, and retrieving information

- Encoding – getting it into the system
- Storage – putting it somewhere
- Retrieval – what we usually think memory is
- Explicit Memory: Conscious, intentional recollection of an event or of an item of information
  - Measuring Explicit memory
    - Recall
    - Recognition
- Implicit Memory: Unconscious retention in memory, as evidenced by the effect of a previous experience or previously encountered information on current thoughts or actions
Types of Memory

- Sensory Memory
  - Fleeting Impressions and Entryway of Memory
- Separate memory subsystems for each sense
  - Iconic Memory – vision, millisecond
  - Echoic Memory – hearing, > second
Short Term Memory
- Sensory to Short Term (or lost!)
- Magic Number 7 (+/- 2) Phone number
- “Working memory”
- Transfers information to LTM or information decays and is lost
- Limited in capacity and duration
- 30 seconds or so
  - Chunking: A meaningful unit of information
    - Memory limitations may be overcome by chunking
    - Grouping larger bits of information into smaller units (e.g., area code)
- What happens if we lose STM?
- Forgetting in STM
  - Decay
  - Displacement (interference)
- Long Term Memory
  - Short-Term to Long-Term Memory
  - Rehearsal
  - Encoding
  - Relatively Permanent
  - Duration and Capacity may be indefinite
  - Write down everything you know
  - Semantic (memory for general knowledge)
  - Episodic (memory personal recollections and events)
LONG-TERM MEMORY

PROCEDURAL MEMORIES
("Knowing how")

DECLARATIVE MEMORIES
("Knowing that")

SEMANTIC MEMORIES
(General knowledge)

EPISODIC MEMORIES
(Personal recollections)
Information from environment

Sensory register
1. Large capacity
2. Contains sensory information
3. Very brief retention of images (up to 1/2 second for visual; 2 seconds for auditory)

Short-term memory (STM)
1. Limited capacity
2. Brief storage of items (up to 30 seconds if no rehearsal)
3. Involved in conscious processing of information

Long-term memory (LTM)
1. Unlimited capacity
2. Storage thought by some to be permanent
3. Information organized and indexed

Retrieve

Forgotten
Transferred
Forgotten
Transferred/Retrieved
Serial Position Effect

- Primacy effect
- Recency effect

Probability of remembering

Position of the item in the list
- Memory is selective

- Ways to increase memory
  - Effective Encoding
  - Rehearsal of information keeps it in short-term memory and increases the chances of long-term retention
  - Mnemonics
    - ROY G. BIV
    - HOMES
- Failure of Memory
- Anterograde Amnesia
  - Cannot form new memories
- Retrograde Amnesia
  - Can remember old memories
- Dementia and Alzheimer’s
- **Retroactive Interference (Inhibition)**
  - Cannot remember old info
- **Proactive Interference (Inhibition)**
  - Cannot remember new info
Developmental Psychology

How do we develop?
- Cognitively
- Physically
- Socially

When do we stop developing?
Conception to death.
- Nature versus Nurture/Hereditary versus Environment
  - Which is most important?
  - Kellogg’s study
    - Don and Gua
    - Confounded variable?
- Feral Children studies
  - Ability to talk, walk, act human
  - No way would be totally successful if past the sensitive periods of time for development.
  - Confounded variable?
- Heredity gives us the “stuff” of development
- Environment brings the “stuff” out
- Generally consider it to be 50%/50%
- What if we had a particularly damaging hereditary influence or environmental influence?
- Genes and behavior
  - Phenotype
    - Physical appearance based on genotype
    - Let us assume a simple world
  - Dark and light
- Genotype
  - Homozygous dominant BB
  - Homozygous recessive bb
  - Heterozygous Bb
Punnett Squares

- What is the Phenotype if one parent is Homozygous Dominant and one parent is Homozygous Recessive?
  - What are the chances that the child will exhibit the recessive phenotype?
- What is the Phenotype if one parent is Homozygous Recessive and one parent is Heterozygous?
  - What are the chances that the child will exhibit the recessive phenotype?
<table>
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<tbody>
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**Figure 4**
Germinal Period

- Fertilized egg (or zygote) divides repeatedly into a mass of cells.
- First 2 weeks after conception.
- By 1 week after conception, the fertilized egg is composed of 100 to 150 cells.
Embryonic Period
- 2 to 8 weeks after conception
- Rate of cell differentiation intensifies, with support systems and organs beginning to form
- Takes on human form with eyes, ears.
- Four versus eight weeks
Fetal Period
- Growth and development continue dramatically
- Three months after conception, the fetus is about 3 inches long and weighs about 1 ounce
- 14 weeks, 16 weeks, birth
DNA
- Genetic information
- Does not matter where the cell comes from

Identical Twins
- Monozygotic – genetically the same

Fraternal Twins
- Dizygotic
- What if eggs are fertilized at different times?
- **Trimesters**
  - **Teratogens**
  - **Greatest effects – first trimester**
- **Amniocentesis – prenatal sampling of amniotic fluid**
- **Spontaneous abortions**
  - Usually due to a fatal genetic flaw
- **Critical (ONLY) versus Sensitive (BEST) periods**
Piaget and Cognitive Development

- Cognitive development consists of mental adaptations to new observations and experiences. (Cognitions=thoughts)

- Schemes – characteristic ways of approaching or solving a problem
  - First schemes we have are reflexes
- Stages are Qualitatively Different
  - Know the same but use it differently
  - Develop new and unique ways of thinking at each stage
- Adaptation takes two forms
  - Assimilation-Absorbing new information into existing schemes or knowledge.
    - Sucking a bottle or a glass
    - Dog = all animals are dogs
Accommodation-Modifying existing schemes or knowledge in response to experience and new information.

- Sucking to drinking
- **Sensorimotor B-2**
  - Uses senses and motor abilities to understand the world
  - Thinking is displayed by action only
  - 6 months--object permanence
    - No more “out of sight out of mind”
  - 18 months—insight
  - Primitive cognitions
- Preoperational 2-7
  - Centration/Egocentrism
    - Unable to take another perspectives
    - Trade a nickel for a dime
    - Bath

- Think symbolically to represent environment and use a language
  - “Your father is my husband.”
- Name of object becomes part of that object
Concrete Operational  7-11
- Conservation of number, mass, forms and weight
  - Realization that objects or sets of objects stay the same even when they are changed about or made to look different.
- Clay and blocks
- Decentration
- Formal Operational 11 onward
  - Might be limited by area of expertise
  - Abstract reasoning
  - Hypothetical thought
  - Hypothesis testing
  - Every possible logical alternative or systematic experimentation
    - Words (three consecutive triple letters, consonants)
    - Snail and well
    - Gold and aluminum
    - Two liquids and you get red
Sigmund Freud

- Libido-Psychic Energy
  - Same amount over life
- Fixation-stagnation
  - Overgratification
  - Undergratification
- Oral Stage - Sucking, chewing
- Anal Stage - bladder retention/elimination
- Phallic Stage - Oedipus / Electra complex
- Latency Stage - Dormant
- Genital Stage - Not a new stage per se
  - “Lieben und arbeiten” (to love and to work)
Harlow and Contact Comfort

- Wire vs. Terrycloth
- When frightened will run to the cloth surrogate for security and comfort
- Why important
Motivation and Emotion

- **Primary Emotions**
  - Considered to be fairly universal and biologically based.
  - Generally include: fear, anger, sadness, joy, surprise, disgust, and contempt.

- **Secondary Emotions**
  - All other emotions and blends of primary emotions.
  - About the age of 6 months.
DISGUST, SADNESS, ANGER, INTEREST, FEAR, SURPRISE, JOY
Schachter and Singer
- Correctly or Incorrectly informed about the adrenaline.
- Label, interpreting, and cognitions.
Motives

- A need or desire that energizes, sustains, and directs behavior toward a goal.
Yerkes-Dodson Law of Motivation

![Graph showing the relationship between level of arousal and performance.](image)

**Figure 3.** Generalized Effects of Arousal on Performance
Hunger

- Hypothalamus
  - Lateral – Start
  - Ventromedial – Stop

- Do we learn what we like to eat?
- About 30 days without food.
Thirst
- Ossmoreceptors
- Cellular dehydration
- Do we learn what we like to drink?
- About 7 days.

Pain Avoidance
- Brain
- Most prepotent
- Sex Humans versus Animals
  - Males versus Females
  - Androgens and Estrogens
    - Testosterone and Progesterone
  - Primary versus Secondary Sexual Characteristics
    - Reproduce versus Learned
    - Prior to or After sexual maturity
      - Severely disrupted versus No difference
Psychological factors versus Physical

Sexual peaks
- Males 19 females 35
- Refractory periods in males
- Plateaus, resolution, and multiple in women
  - Fertile about 3 days a month

The brain is our most important sex organ!

Half of 9-12th graders in the US report having had sexual intercourse
- STDs
  - Bacterial
    - Chlamydia (most common STD), syphilis, gonorrhea.
  - Antibiotics
  - Can get through oral contact.
  - Can cause sterility and even death if not treated properly.
- Symptoms
  - Discharge, pain when urinating.
  - At times can be asymptomatic.
Viral

- Difference between HIV and AIDS
  - Cannot test, do not know and highly infectious first four months.
  - Women 20 times more likely to get.
  - High risk times and groups

- South Africa
  - Can get through oral contact.

- Genital Herpes – never get rid of
  - 20% of the population.
  - Can get through oral contact.
Only known way to avoid STDs

- Abstinence.
- STDs can cause death.
% High School Students, Sexual Intercourse

<table>
<thead>
<tr>
<th>PERCENTAGE OF HIGH SCHOOL STUDENTS WHO HAVE EVER HAD SEXUAL INTERCOURSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEMALES</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td><strong>By Grade in School</strong></td>
</tr>
<tr>
<td>9th grade</td>
</tr>
<tr>
<td>10th grade</td>
</tr>
<tr>
<td>11th grade</td>
</tr>
<tr>
<td>12th grade</td>
</tr>
<tr>
<td><strong>By Ethnicity</strong></td>
</tr>
<tr>
<td>White, non-Hispanic</td>
</tr>
<tr>
<td>African American</td>
</tr>
<tr>
<td>Hispanic</td>
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</tbody>
</table>
## Sexual Interest, Activity in Older Adults

**SEXUAL INTEREST AND ACTIVITY IN OLDER ADULTS**

<table>
<thead>
<tr>
<th></th>
<th>AGED 50-59</th>
<th>AGED 60-69</th>
<th>AGED 70 AND OLDER</th>
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</thead>
<tbody>
<tr>
<td>Sexually active*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>93% (N** = 801)</td>
<td>81% (N = 719)</td>
<td>65% (N = 324)</td>
</tr>
<tr>
<td>Men</td>
<td>98% (N = 823)</td>
<td>91% (N = 981)</td>
<td>79% (N = 598)</td>
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<tr>
<td>Sexually active, reporting sexual activity at least once a week*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>73% (N = 743)</td>
<td>63% (N = 582)</td>
<td>50% (N = 211)</td>
</tr>
<tr>
<td>Men</td>
<td>90% (N = 804)</td>
<td>73% (N = 893)</td>
<td>58% (N = 473)</td>
</tr>
<tr>
<td>Sexually active, reporting a high level of sexual enjoyment*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>71% (N = 743)</td>
<td>65% (N = 582)</td>
<td>61% (N = 211)</td>
</tr>
<tr>
<td>Men</td>
<td>90% (N = 804)</td>
<td>86% (N = 893)</td>
<td>75% (N = 471)</td>
</tr>
</tbody>
</table>

*Includes sex with a partner or alone (masturbation)

**N = number of people surveyed

### % of People Still Sexually Active with Partners by Age

#### PERCENTAGE OF PEOPLE STILL SEXUALLY ACTIVE WITH PARTNERS, BY AGE

<table>
<thead>
<tr>
<th>Age</th>
<th>Women</th>
<th>Men</th>
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</thead>
<tbody>
<tr>
<td>70-74</td>
<td>30%</td>
<td>65%</td>
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<tr>
<td>75-79</td>
<td>22%</td>
<td>53%</td>
</tr>
<tr>
<td>80-84</td>
<td>9%</td>
<td>48%</td>
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</table>

One in four women reported that a man (usually a husband or boyfriend) had forced them to do something sexually that they did not want to.

Only 3% of men reported they had ever forced a woman into a sexual act.

How do you explain these findings?

What many women regard as coercion is not always seen as coercive by men.

Statistics and rape.

Reasons people rape.
Psychological Concerns

- **Gender Identity Disorders**
  - Transsexualism
  - Genetic sex in conflict with physical or want

- **Sexual reassignments**
  - Female to male better chance to conceive
  - Transvestites? No – 0% chance
    - Transvestite – Arousal by cross dressing
- Psychological Motives
  - Pretty much totally learned
    - Power

- Social Motives
  - Have both learned and unlearned factors
    - Curiosity, Manipulation