Sex

- Why ‘worry’ about reproductive behaviors?
  -Sex/love: at the bases of many social interactions. At the bases of art production (literature, painting...)
  -Sexual behavior (sex) vs. sexual experience (emotion): two different (interacting) neural systems. Consequences: physical and psychological
  -sexually dimorphic behaviors: some differences between male/female behaviors are due to at least part of sex differences
  -what are the neutral structures that are influenced by sex differences? What psychological functions might be affected by sex differences? How?
  -sexual orientation: How much is ‘psychology’? How much is “biology”?

Genetic Sex

- Genetic factors
  -gametes = ova + sperm. 23 chromosomes each → total of 23 pairs
  -1 pair of sex chromosomes
  -the x-rating! : 3 x-only gametes but 50% XY

- Genetic sex is determined by the male gametes

![Diagram showing the genetic sex determination process](Image)
Y chromosome → activate other chromosomes → sex differences

- **Gonads**
  - testes + ovaries: produce sperm, ovum, and hormones
  - 1 gene on the Y chromosome will trigger testes development (SRY gene)
  - gonads are physically differentiated 6 weeks after conception, functionally differentiated after 3 months gestation
  - after gonad development: organizational vs. activational hormonal effects

- **SRY Testing:** gender verification: was abandoned in 2000, single genes are not reliable indicators of sex/gender
  - SRY is the male determination factor

**Sex: Internal Genitalia**

- Internal sex organs
  - **Mullerian and Wolffian systems**
    Male gonads (testes) produce:
    - anti-mullerian peptide hormones (defeminizing)
    - pro-wolffian steroid hormones called *andro gens* such as testosterone or dihydrotestosterone (masculinizing)

US Census 1996: Males: 48.9%
Females: 51.1%

- **Fallopian Tubes**
- **Uterus**
- **Inner Vagina**
  - Epididymis, vas deferens, seminal vesicles, prostate
  - Clitoris, Labia, Penis, Scrotum

**External Genitalia**

**Internal Genitalia**

**Genetic disorders:**
- androgen insensitivity syndrome (XY: look female but no female internal organs)
- persistent mullerian duct syndrome (XY: look male but internally both male and female)
- Turner Syndrome: XO (look female internally and externally, but no gonads)

**Turner syndrome karyotype**

![Turner Syndrome Karyotype](image)

**Sex**

- External Sex Organs
  - primary sex characteristics (birth): gonads, internal genitalia, external genitalia
  - secondary sex characteristics (puberty): facial hair, breasts

**Sex: Puberty**

- Puberty
  - Gonadotropin- releasing hormones
  - gonadotropic hormones

Note: In females, pubic and axillary hair depend on adrenal gland (kidney)
- CNS/PNS Sex controllers
Sex: Hormonal Control

- Hormones have activational and organizational effects. They also act on the nervous system → sexually dimorphic behaviors

Hormonal Cycles: females
- Estrous cycle: last several days, only a period of mating

Progesterone: lining of uterus, inhibits further ovum production. If there is no fertilization → decrease → loss of lining → menstruation

Notes:
- Women are born with ovum and lose ovum throughout life
- Men aren’t born with sperm and gain sperm throughout life

Sex: Hormonal Control

Male Sexual Behavior
- Intromission → pelvic thrusting → ejaculation → refractory period

Coolidge effect: decrease of refractory period with the introduction of new females

Female Sexual Behavior
- Lordosis
  - 3 measures of sexual behaviors:
    attractiveness: change in male behavior
    proceptivity, receptivity: change in female behavior
- Androgens (testosterone) have organizational effects on behavior
- Testosterone immediately after birth has behavioral defeminization and later, behavioral masculinization effects
**Pheromones**
- sexual communications between individuals, VomeroNasal organ

**Animals:**
- VNO: sensitive to urine (rat)
- Damage of VNO: poor discrimination between mole and female (mice)  
- Single neurons in accessory olfactory bulb can selectively respond to male and female scents (rodents)

**Humans:**
- T-shirt smell → male/female discriminations in humans
- In humans: sweat carries sexually dimorphic molecules

**Pheromones: Experimental Evidences**
- Lee-Boot effect: groups of co-housed female mice → stop of estrous system
- Whitten effect: synchronization of estrous cycle, if male odor present
- Vendenbergh effect: early onset of female puberty upon exposure to male pheromones
- Bruce effect: female mouse inseminated exposed to new male (contact testes) → failed pregnancy
- Classroom seating effect: possibly anecdotal...