Chapter Ten

Sexual Behavior
Sexual Development – In the beginning…

• What determines a person’s sex? Check Genes. #23 is either XX (F) or XY (M) Dad’s the decider!

• Sexual chromosome abnormalities

• Turner syndrome (XO). No Y?
  • Normal female external genitalia but ovaries develop abnormally
  • Normal intelligence, deficits in spatial relationships and memory

• Klinefelter syndrome (XXY)
  • Male genitalia with reduced fertility (low androgen levels)
  • Require hormone treatment at puberty to develop secondary sex characteristics and inhibit female characteristics
  • Normal intelligence but social awkwardness, & reduced verbal skills

• XYY (no syndrome?)
  • Subtle physical (tall with acne) and behavioral correlates
  • Controversial association with antisocial behavior
Figure 10.2 The Human Genome

Typical human females and males have 22 chromosome pairs in common.

The 23rd pair, the sex chromosomes, differentiates between females and males.

Typical female

OR

Typical male
Sexual Development

• Three Stages of Prenatal Development – begins with
  – The Development of Gonads
    • Sex determining region (SRY gene) of Y chromosome expressed at 6 weeks gestation – prior to that, junior has no sex.

• Differentiation of Internal Organs
  • Everyone starts off with BOTH systems available
  • Testosterone levels at 3 months promote the Wolffian system to develop into the seminal vesicles and the prostate
  • In the absence of testosterone, the Müllerian system develops into the uterus, upper vagina, and fallopian tubes

• Androgen insensitivity syndrome (AIS)
  • XY genotype, but female appearance and gender identity
  • disrupts normal development of the Wolffian system

• A fetus may develop both male & female elements – this is referred to as being intersexed
Figure 10.4 Differentiation of Gonads and External Genitals
Prenatal Sexual Development – Stage 3

• External Genitalia
  • No hormonal activity required for development of female genitalia
  • 5-alpha-dihydrotestosterone needed for development of male genitalia

• Androgen Insensitivity Syndrome
  • Androgen receptors don’t work, so the Wolffian & Müllerian systems both fail to develop
  • Person has XY (male) genetic make up, but female outer appearance

• Congenital Adrenal Hyperplasia
  • Adrenal glands release higher than normal levels of androgens
  • Fine for the guys, but female genital development gets messed up
  • Girls more tom boy-ish, but most are predominantly heterosexual
  • Ladies are more likely to engage in lesbian or bisexual behavior though
Figure 10.6 Congenital Adrenal Hyperplasia (CAH) Masculinizes Genetic Female
What’s Next in Sexual Development?

• Puberty! We get secondary sex characteristics
  – Males: facial / body hair, deeper voice, larger penis
  – Females: wider hips, more stored fat, breasts, body hair, and of course… menstruation

• Onset of puberty has been declining. Nutrition?

• Developmental changes are caused by
  – Gonadotropin-releasing hormone (GnRH) released by the hypothalamus, which stimulates the pituitary to release
  – Follicle-stimulating hormone (FSH) and luteinizing hormone (LH). These have different effects in males and females
  – Testes get busy producing more testosterone, while ovaries produce estradiol, and FSH promotes follicle maturation
Figure 10.7 Female Age at Puberty

Mean Age at First Menstruation 1840–2000

Age (in years)

Years

1820 1840 1860 1880 1900 1920 1940 1960 1980 2000

12 12.6 years

13 14 15 16
Figure 10.10 Hypothalamic Control of the Pituitary Gland

1. Hypothalamus releases GnRH.
2. Message to anterior pituitary gland:
   - Release luteinizing hormone (LH)
   - Release follicle-stimulating hormone (FSH)
3A. LH message to testes: Release testosterone
3B. FSH and LH control menstrual cycle.
4. Testosterone and FSH cause sperm to mature.
Hormones and Sexual Behavior

• The Menstrual Cycle and Female Fertility
• Stable and predictable fluctuation in events controlled by LH and FSH
• Ovulation about 2 weeks after the first day of the last menstruation

• Correlations Between Mood, Menstruation, and Childbirth
  • Premenstrual syndrome (5% to 8% of women suffer this)
  • Premenstrual dysphoric disorder (abnormal serotonin function)
  • Postpartum depression (10% to 15% of women suffer this)

– Female Contraception
  • Oral contraceptives interfere with ovulation
  • ‘The Pill’ may be progestin only, or, The Combo Pill adds estrogen.
Figure 10.11 The Human Menstrual Cycle

Blood levels of pituitary hormones:
- LH
- FSH

Blood levels of ovarian hormones:
- Estrogens
- Progesterone

Ovarian cycle:
- Developing follicle
- Ovulation
- Corpus luteum
- Degenerating corpus luteum

Thickness of uterine wall:
- Menstruation

Day of cycle chart from 0 to 28 days.
Hormones and Sexual Behavior

• Sex Hormones and Female Behavior
  • Ovulation piques interest a little, testosterone levels have a greater impact on sexual interest
  • Estrogens improve verbal abilities & manual dexterity while testosterone improves spatial abilities

• Sex Hormones and Male Behavior
  • Testosterone levels increase in anticipation of competition, but do NOT predict sexual interest
  • Married (& recently divorced) men have lower T levels
  • Male contraceptives? Really… no market?

• Androgens and Cognitive Behavior in males?
  – Spatial abilities advantage may be related to testosterone
Figure 10.12 Sex Influences Cognition

“Is this the same object?”

Figure Rotation

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Hormones and Sexual Behavior Continued

- Sex Hormones synthesized from cholesterol
- Anabolic Steroids (Faux hormones)
- Artificial versions of testosterone build tissue, strength, muscle mass & improve recovery
- LOTS o’ side effects, including any of these
  - Acne, enlargement of the clitoris or penis, lower voice, unusual hair loss or growth, psychological disturbances, larger breasts in males, high B.P., and kidney disease
- Brain structural differences between sexes?
- Interstitial Nuclei of Anterior Hypothalamus (INAH 2 & 3) is 2X larger in hetero males
Sexual Orientation

• Hormones, Sexual Behavior, and Sexual Orientation
• 98% to 99% of females & 96% to 97% of males report being exclusively heterosexual
• Early exposure to androgens influences adult sexual behavior
• Gay males INHA 3 area comparable in size to a female’s, about ½ the size of a heterosexual male’s
• Genes a factor to consider in homosexual orientation
  – Male fraternal twins concordance rates are 20 to 25%
  – Identical twins concordance rates are 50%
Figure 10.16 INAH-3 Size Correlates with Sexual Orientation
What about Sexual Attraction?

• The Importance of Symmetry
  – Degree of similarity of one side of face or body to the other

• The ‘Beauty’ of Fertility and a Good Immune System
  – Preference for younger features on female
  – Preference for masculine men (testosterone-related facial features) for a short term or casual sexual encounter, less masculine men for long-term partner

• Evolutionary Psychology & gender specific mating strategies
  – Males should be promiscuous
  – Females should be selective
Hormonal Differences in Bonding and Parenting

- Oxytocin & Vasopressin levels vary in sexes
  - Women have higher Oxytocin levels, which affects bonding with others & newborns in particular
  - Oxytocin released during orgasm in both sexes
  - Men have higher Vasopressin levels (less bonding?)

- One last topic – Sexual Dysfunctions -
- Masters and Johnson estimated half of couples experienced some sexual problem
  - Many sexual dysfunctions are psychological in origin
  - Erectile dysfunction can be treated by enhancing activity of Nitric Oxide (NO)