Human Sexual Behavior
-what makes sexual behaviors different between adult males and females?
-hypothesis: activation effect of hormones (during development)

Females
-rats: hormones (estradiol +progesterone) control the behavior (e.g. lordosis) and the motivation
-primates: hormones do not control the behavior, but perhaps the motivation
-female motivation/initiation is highest when estradiol is high, in primates: corresponds to period of high male selectivity

Sexual Orientation
-sexual orientation: gender of preferred sexual partner (homosexual vs heterosexual)
-other dimensions of sexual preferences: monogamy, polygamy, age
-dependence on developmental (education) vs genetic (physiology) factors
  -in some cases, sexual orientation can be explained by prenatal exposure to androgens and genetic factors

-genetic females
  -congenital adrenal hyperplasia: too much androgens prenatally
  -mid physical effects (e.g. enlarged clitoris)
  -increased likelihood for homosexual preferences
  -increased likelihood for male 'behaviors' (e.g. toys)
  -sexually dimorphic behaviors

-genetic males
  -failure of androgenization: androgen insensitivity syndrome
  -XY looking female
  -internal testes produce testosterone (but there are no receptors)
  -production of estrogens (small amounts) produce feminization
  -normal female sex lives/behaviors
    -XY genes not sufficient for heterosexual behaviors, lack of androgens likely to result in homosexual behaviors (but not necessary)

-genetic factors
  -twin studies: significantly more monozygotic (identical) twins are both homosexual when compared to fraternal twins
    -genetic components for both male and female homosexual orientation
    -there are sexual dimorphisms in the brain, but they (as of today) do not explain sexual orientation

-brain difference
  -men vs women: corpus callosum + few other areas (incl. hypothalamus)
  -hetero vs homo-sexual: inconclusive (or to the very least: indirect:)

-do animals show homosexual behaviors?
-homosexual behaviors vs 'being' homosexual
-500-1500 species
-homosexual behavior for dominance
-homosexual behavior for bonding

Neural Control of Sexual Behavior
-males
   -medial preoptic area: evidence from recording, stimulation and lesion studies
   -sexually dimorphic nucleus of MPA: androgen-induced enlargement in males
   -mostly inhibitory pathway, normal behavior: PGI needs to be constantly inhibited
   -periaqueductal gray (midbrain, PAG:erection), nucleus paragigantocellularis (medulla, PGI:ejaculation)
   -SSRIs (antidepressants) decrease male sexual behaviors

Male Sexual Behavior
-the amygdala receives sensory inputs, and inputs indicative of sexual behavior (information about stimuli and performance of sexual behavior)
-the amygdala sends it outputs to the MPS ('emotional' control of sexual behavior)

Neutral Control of Sexual Behavior
-females
   -ventromedial nucleus of hypothalamus:lessons and simulation studies
   -estradiol and progesterone (in rats) act in VMH
   -mostly excitatory pathway, normal behavior: PGI needs to be excited
   -PAG active in female sexual behavior (orgasms in scanner)

Female Sexual Behavior
-as in males, sensory inputs converge in the amygdala, and the amygdala influences female sexual behavior (VMH)

Neural Control of Bonding
- 5-7% mammalian species are monogamous (possibly 'serially monogamous')
-prairie voles monogamous, meadow voles are polygamous
-in voles:monogamy:high levels of oxytocin (females) and vasopressin (males)
-in humans:oxytocin increases trust, involved in empathy

Parenting Behavior
-parturition: set of behavior at and immediately after giving birth (nesting, hiding, cleaning, nursing)
-example: rat milk production equiv. 2 gallons milk/day, urine recycling and fluid exchange between mother and pups, chemical signals pups to mothers
- hormones and maternal behaviors
  - rats: prolactin (maternal behavior), oxytocin (maternal bonding)
  - humans: postpartum depression affects 13% of women
- neural structures and parenting behaviors
  - MPA: lesion studies affect maternal but not sexual behaviors
  - MPA, oxytocin and prolactin also involved in paternal behaviors