Lecture 10: Sexuality and Orgasm

- Primate Sexuality — where do we come from?
- Concealed ovulation
- Hormones & Sexual behavior
- Human Female Orgasm
  > Physiology
  > Explanations — adaptation or artifact?

Warrior Initiation & Circumcision in the Maasai
Circumcision

- Found especially in strongly patrilineal and patriarchal societies
- Symbolizes belonging to a male kin group.
- Ritual circumcision -- at puberty or after birth
- Why the penis?
- Non-religious circumcision developed in English speaking countries at the end of 19th century as 'cure' for masturbation
- Medical foundation for circumcision debated.
  - US only country in world with routine non-religious circumcision
  - 80% of men in world not circumcised
  - By 1984, 40% of US babies not circumcised.
Circumcision

Functions of Foreskin
- Protects the glans of the penis
  - Shield glans and urinary opening from irritation due to feces and urine (newborn) and friction
- Smegma - produced by Tyson’s glands of Glans
  - Protects the glans
  - Lubricates the glans during intercourse.

Changes with Circumcision
- Cornification of the Glans:
  - Increased thickness (10x) in outer cell layer
  - Free nerve endings disappear
  - Surface cells covered with a layer of dead cells
- Smega no longer produced for lubrication
- Skin on penile shaft is tighter

Cost & Benefits of Non-Religious Circumcision

<table>
<thead>
<tr>
<th>Costs</th>
<th>Benefits</th>
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<tbody>
<tr>
<td>Risk of non-essential surgical procedure, mutilation or damage - 1-3%</td>
<td>Possible slight decrease in rates of penile cancer and STD’s, but study results are equivocal</td>
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<tr>
<td>Emotional stress on baby</td>
<td>1% risk of urinary tract infection during 1st year of life without circumcision</td>
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<tr>
<td>Ulcerations formed around urinary opening</td>
<td>May decrease AIDS risk</td>
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<tr>
<td>Decreased sensitivity of glans</td>
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<tr>
<td>Lack of smega production for lubrication</td>
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<tr>
<td>Increased tightening of skin of shaft</td>
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Examples of Primate Sexuality

Primate Sexuality

• Non-reproductive sexuality is NOT uniquely human

Gorilla Sexuality

• Mating confined to a few days around ovulation
• Slight sexual swelling
• Females solicit mating from silverback male

Chimpanzee Sexuality

• Promiscuous mating
• Estrus chimp may copulate 30-50 x per day
• Concentration of mating with dominant male(s) mid-cycle
Function of Estrus Swellings?

• Attraction of many males to avoid infanticide
• Incite male-male competition
• Ensure mating with the dominant male
• Advertise fecundity
• Select males with particular genotypes

Orangutan Sexuality

• Females do not show signs of ovulation
• Variety of sexual behaviors and positions
• Long periods of mating (3-17 minutes)
• Forced copulations
• Mating during periods of high energy balance/hormonal levels
Bonobo Sexuality
• A high degree of non-procreative sexual activity

Bonobo Sexuality
• A high degree of non-procreative sexual activity
• Regular occurrence of female-female sexual behavior

Bonobos
Explanations for G-G Rubbing
• Reconciliation
• Mate attraction
• Tension Regulation
• Expression of social status
• Social bonding/alliance formation

Bonobo Testosterone Levels and G-G Rubbing

Orgasm in Female Primates
• Rhesus macaques
• Stumptail macaques
• Japanese macaques
• Orangutans
• Chimpanzees
• Bonobos

All involved manual stimulation, not during intercourse

What is our Sexual Inheritance?
• Primate females are much more actively sexual than previously thought
### What is our Sexual Inheritance?

- Primate females are much more actively sexual than previously thought
- Primates engage in sex for other reasons besides procreation

### Concealed Ovulation in Humans

- Continuous receptivity in humans strengthened the pair-bond and increased paternal investment in offspring through frequent copulations

Weakened by:

- Evidence of high, non-reproductive sexual behavior in non pair-bonding primates
- Low rates of sexual activity in other pair-bonded species

-(Morris, 1967)-

### Concealed Ovulation in Humans

- Force desirable males into consort relationships long enough to ensure paternity and not seek other matings

-(Alexander and Noonan)-
Concealed Ovulation in Humans

• Prevention of women themselves limiting the number of their children because of pain of childbirth.

Hormonal Influence on Sexual Behavior

• Slight rise in testosterone around time of ovulation - some studies show increase in sexual behavior (female initiated)

Testosterone and Female Sexual Behavior

Western Populations

Female Sexuality in !Kung

• Peak in sexual behavior at mid-cycle
  • Husbands and lovers

(Worthman, Ph.D. thesis)
Female Sexuality in !Kung

- Peak in sexual behavior at mid-cycle
  - Husbands and lovers
  - Increase in peak rate of orgasm at mid-cycle

(Worthman, Ph.D. thesis)

Orgasm and Symmetry

Ovulation and Extra-pair copulations

Sexual Response Cycle

- Excitation
  - Vaginal lubrication
    - Transudation - vasocongestion in walls of vagina lead to moisture
  - Inner 2/3 of vagina expands
  - Cervix and uterus pulled upwards
  - Labia majora flatten and move apart
  - Labia minor and clitoris enlarge
  - Contraction of small muscle fibers in nipples
  - Breast size may increase
  - Veins on breast more visible
Sexual Response Cycle

- **Excitation**
- **Plateau**
  - Prominent vasocongestion in outer 2/3 of vagina cause tissue to swell
  - Vagina narrows by 30% or more
  - Clitoris pulled back against pubic bone (hides and protects it from direct touch)
  - Labia minora may double or triple in size
  - Color changes develop

- **Orgasm**
  - Through intercourse alone= indirectly from penile shaft distention (manual traction) of labia minora at opening of vagina.
  - Or through direct manual stimulation
  - Contractions at 0.8 second intervals
  - Average time = 4 minutes (masturbation) and 10 minutes (intercourse)

- **Resolution**
  - Return to pre-orgasmic state

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Frequency of Female Orgasm (western populations)

- **Always**
- **Frequently**
- **Sometimes**
- **Rarely**
- **Never**

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How do women achieve orgasm?

- 95% women said could orgasm easily with masturbation
- Women masturbate through manual stimulation of clitoris
- 1.5% through vaginal insertion alone
- Little cross-cultural information

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Multiple Orgasms?

**Women**

- 14% of women
- Return to the plateau phase, rather than resolution after orgasm
Multiple Orgasms?

*Men*

- Pattern seen in pre-pubescent boys (55%)
- 8-15% of younger adult males and 3% of adult men
- Ejaculation seems to prevent return to plateau stage

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Is ‘The Female Orgasm’ Adaptive?

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Female orgasm as non-adaptive

- Females have low variance in reproductive success (RS)

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- Variance in sexual behavior does not effect a woman’s RS
- Female orgasm is a by-product of mammalian bi-sexual potential. Orgasm is possible because it is adaptive for males.
- Can’t be adaptive because it doesn’t always happen.

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- Female orgasm is a by-product of mammalian bi-sexual potential. Orgasm is possible because it is adaptive for males.
- Can’t be adaptive because it doesn’t always happen.

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(Symons 1979; Gould 1991)
Problems with Non-adaptive Hypothesis

- Assumes that females in a natural state — unlike males — breed at or near their reproductive capacity, and that there is little room for natural selection to operate on females

**Adaptive Hypothesis: Intermittent Reinforcement**

- Female orgasm has been selected to be irregular
- Increases likelihood of mating
- Encourage Extra-Pair Copulations (EPC)
- Non-human primates have orgasms

**Problems with Non-adaptive Hypothesis**

- Assumes that females in a natural state — unlike males — breed at or near their reproductive capacity, and that there is little room for natural selection to operate on females
- Assumption that copulation serves no function other than insemination

**Intermittent Reinforcement**

- Female orgasm has been selected to be irregular
- Increases likelihood of mating
- Encourage Extra-Pair Copulations (EPC)
- Little evidence that human females engaged in closely spaced repeated copulations with multiple males
- Non-human primates have orgasms
- But, not during intercourse

Is ‘The Female Orgasm’ Adaptive?

**Problem with debate:**

Assumes female orgasm = Female sexuality

“...It is difficult to see how expending time and energy pursuing the will-o-the wisp of sexual satiation, endlessly and fruitlessly attempting to make a bottomless cup run over, could conceivably contribute to a female’s reproductive success. On the contrary, insatiability would markedly interfere with the adaptively significant activities of food gathering and preparing and child care.”

*Symons, “The Evolution of Human Sexuality,” 1979*
### Questions about female sexuality:

1. **Is ‘the female orgasm’ adaptive?**
   - Non-human primate females appear capable of orgasm (not during intercourse) but not necessarily from intercourse. (Masters & Johnson)
   - Capacity for orgasm may be a universal — although not universally realized (Masters & Johnson) but not necessarily from intercourse.

2. **Is the clitoris a product of natural selection?**
   - Function of the clitoris: transmits pleasure upon stimulation that may or may not culminate in orgasm.
   - The size and position of the clitoris shows variation between primate species.
   - In humans, the clitoris is sometimes removed as a way to control/remove female sexual pleasure.

3. **Is female sexual response adaptive?**
   - Capacity for orgasm may be a universal although not universally realized (Masters & Johnson). Orgasm probably not frequent in many cultures.
   - Orgasm during intercourse occurs about 1/4 of the time in some studies of western women (should go to fixation if adaptive for intercourse).
   - Problems with adaptive argument. Probably does not qualify as a physiological adaptation per se.
Is female sexual pleasure adaptive?

- Does the potential for female sexual pleasure affect her behavior and ultimately her reproductive success?
  - Increase the probability of seeking extra-pair copulations, which under some circumstances may lead to:
    - Improved “genetic” quality of offspring
    - Confusion of paternity and investment from more than one male

Is female sexual pleasure adaptive?

- Does the potential for female sexual pleasure affect her behavior and ultimately her reproductive success?
  - Increase the probability of seeking extra-pair copulations, which under some circumstances may lead to:
    - Improved “genetic” quality of offspring
    - Paternity confusion and investment from more than one male
  - Strengthen the duration of pair-bond with an investing male — influencing offspring survival

Is female sexual pleasure adaptive?

- Does female arousability (or orgasm) increase the probability of conception?
  - Arousability facilitates copulation
  - Orgasm and sperm retention

Orgasm & Sperm Retention

- 35% sperm ejected by female within 30 minutes
- Sperm retention influenced by female orgasm
- Orgasm more than 1 minute before male ejaculation led to highest level of sperm retention
- Sperm from one copulation hindered retention of sperm at next copulation up to 8 days

Female Orgasm and Male Ejaculation
Female Orgasm and Male Ejaculation

- Timing isn’t right
- Don’t know how much ejaculated, thus hard to measure flow-back accurately
- Small sample size, certain individuals over sampled
- Hasn’t been replicated

Intercourse and oxytocin release

- Intercourse alone causes release of oxytocin
- Oxytocin may increase sperm uptake

Is female sexual pleasure adaptive?

- Does female arousability (or orgasm) increase the probability of conception?
  > Arousalability facilitates copulation
  > Orgasm and sperm retention
    > Evidence not good for orgasm and sperm retention
    > IS evidence for a role of intercourse in oxytocin release and sperm retention

Female Sexual Adaptations:

1. Is ‘the female orgasm’ adaptive?
   No, Probably has not been selected for independently
2. Is the clitoris a product of natural selection?
   Yes, shows evidence of this.
3. Is female sexual response adaptive?
   Yes, there is evidence of this

Next Time …Male Reproductive Strategies

- Male Reproductive Strategies
- Control of Females & Female Sexuality
- Evolution of Patriarchy
- Fathering