

Recent research reveals

In an astonishing study recently undertaken in Western Europe, the following facts emerged: Married females choose to have affairs with males who are dominant, older, more physically attractive, more symmetrical in appearance, and married; females are much more likely to have an affair if their mates are subordinate, younger, physically unattractive, or have asymmetrical features; cosmetic surgery to improve a male's looks doubles his chances of having an adulterous affair; the more attractive a male, the less attentive he is as a father; roughly one in three of the babies born in Western Europe is the product of an adulterous affair.

Why Have Sex? (I)



- We are involved in an “evolutionary arms race” against pathogens who reproduce faster than we do and therefore can modify their genetic structure to overcome our immune system.
- Sex allows us to modify our genetic structure, through our offspring, to win (for a time) this battle.
- Lifjeld and colleagues' findings are yet another illustration of the fact that sex has one killer advantage over other, more efficient means of reproduction. **By mixing the genes of two individuals, sex creates a third - the offspring - with a new, unique combination. This maintains genetic variation, fuelling evolution and keeping one step ahead of agents of infectious disease.** As evolutionary biologist Jonathan Howard put it: if sex causes disease, then it might also be true that disease causes sex. (*Nature* 296-299 (2000))

Why Have Sex? (II)



- Muller's ratchet and Kondrashov's solution
- Deleterious mutations increase simply as the number of genes in an organism increases. More complex organisms have more genes and therefore are more likely to produce offspring with genetic defects. How do complex organisms deal with this problem?
- Sexual reproduction is the costly solution.
- Organisms "shed" deleterious genes by producing offspring that have them and these offspring, because they are less fit, will not pass on the deleterious genes to future generations.
- Offspring that lack the deleterious genes have higher fitness and do not pass on deleterious genes to future generations.

Sexual Selection

Deals with "The advantage which certain individuals have over others of the same sex and species solely in respect to reproduction ... not from being better able to survive in the struggle for existence but from having gained an advantage over other males."

Or, the differential ability of individuals of different genetic types to acquire mates.

Sexual selection leads to sexual dimorphism.

The Two Forms of Sexual Selection

- Inter-sexual (epigamic): based on female choice of certain qualities possessed by males ✨
- Intra-sexual: based on male-male competition for mating rights (development of fighting weapons)

Sexual and Natural Selection

In natural selection, the environment does the selecting. With sexual selection it is members of one's own species that act as the selective agents. With sexual selection "genes act as both fashion models and fashion critics", creating feedback loops that can result in extraordinary and rapid evolution.*

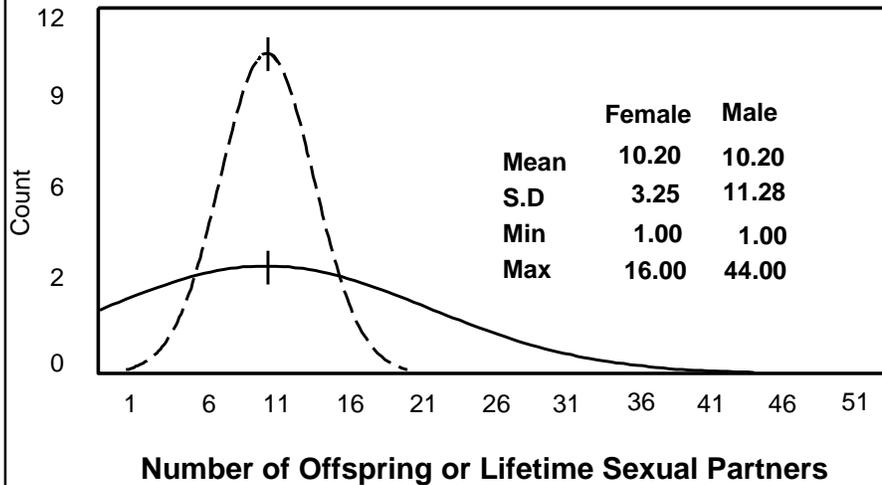
*Paraphrased from Geoffrey Miller's *The Mating Mind*, 2000

Outcomes of Sexual Selection

- Sexual Dimorphism
- Females literally mold male features (epigamic or intersexual only).
- High reproductive variance (generally male)
- Sexual choice:
 - the sex that invests most in reproduction will exercise choice in the selection of a mate (generally, female choice)
- Mating system:
 - usually polygyny and based on male wealth (resource defense polygyny), physical qualities, or status.

Male & Female Differences in Fertility and Sexual Behavior

for Males (—) and Females (---)



Trivers' Parental Investment and Sexual Selection:

The sex that invests most in reproduction will be the choosier sex.

Trivers generalizes that the sex that invests most in reproduction will have different sexual strategies from the sex that invests less. It is clear that females, most of the time (through anisogamy) invest more. As a result, the following can be deduced:

- female RS is limited by either male quality (good genes) or male parental investment
- females will be highly selective because both the costs of error in mate selection and the benefit of a correct choice powerfully affect fitness
- males reproduction will be limited by the number of copulations they can attain but this will have no effect on female RS (but consider partible paternity)
- males will compete with one another for the right to mate with other females

Methodological Problems in the Study of Human Sexuality

- privately performed
- informant reports are distorted
- researchers have cultural biases

Basic Cross-cultural Research

- Symons ***The Evolution of Human Sexuality*** (Oxford, 1979)
- Buss, D. ***The Evolution of Desire*** (Basic Books, 1993)

A difference in perspective

- *Women need a reason to have sex. Men just need a place.* --Billy Crystal
- From *Annie Hall*
 - Diane Keaton “*Sex without love in an empty experience.*”
 - Woody Allen “*Yes, but as empty experiences go, it is one of the best.*”

Universality of the double standard



1. Punishment for adultery harsher for women than for men.
2. Adultery defined as “a man having sex with a woman married to another man.” Whether or not the man is married is irrelevant. This definition is obviously biased.

The Causes of Homosexuality

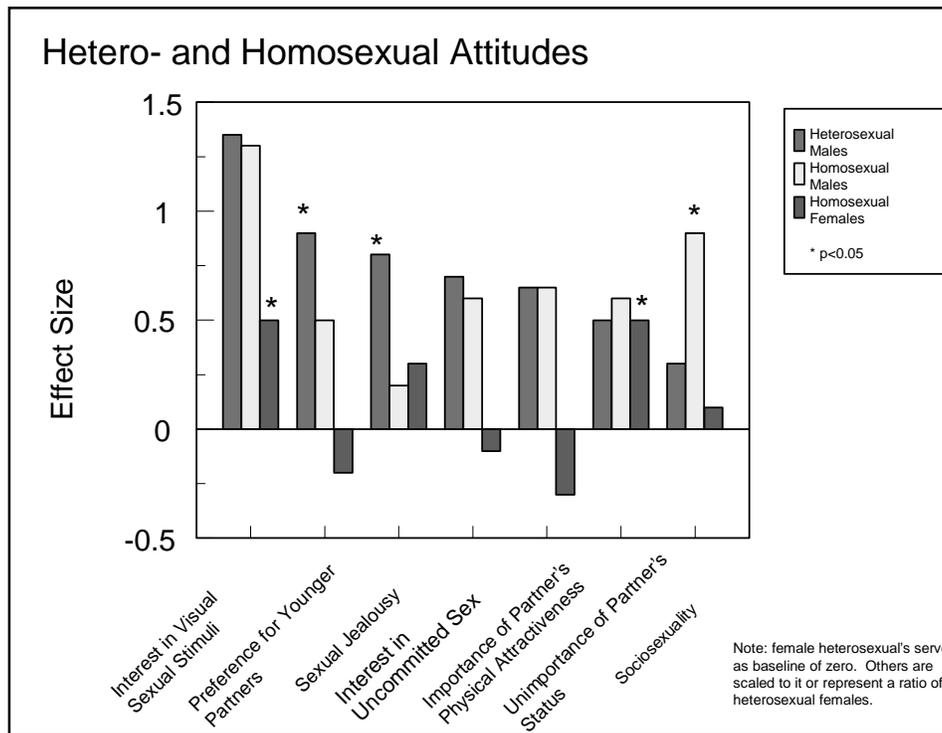
1. Must first know causes of heterosexuality
2. Psychological theories fail to predict the conditions under which homosexuality develops
3. Mounting evidence for a biological basis
4. Politics of Understanding
 - if nurture, then unjustified
 - if nature, then justified
 - both perspectives wrong

From an evolutionary perspective exclusive homosexuality is an enigma

- Attempts to explain from an evolutionary perspective
 - Kin selection
 - Balanced polymorphism
 - It was never exclusive in the past, only in the present

Biological Evidence

- INAH is twice as large in hetero men as it is in homosexual men (LeVay)
- 52% of monozygotic twins are gay compared to 22% of dizygotic and 11% of adopted brothers. Similar results for lesbians found
- **One** form of homosexuality is linked to the Xq28 chromosomal region carried by mothers (LeVay)
- Birth order: last born males in a succession of brothers have a greater and greater probability of becoming homosexual (Breedlove)



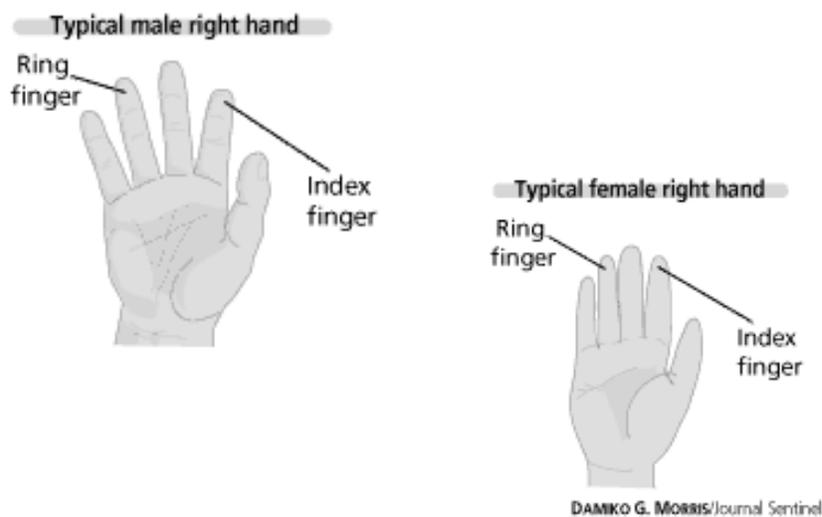
Recent Research on the Biological Bases of Homosexuality (Breedlove)

- It has long been suspected that high levels of androgenic steroids in the uterine environment have a masculinizing effect on the fetus.
- One consequence of this effect is that males tend to have ring fingers (4d) longer than index fingers (2d). Females tend to have ring and index fingers of approximately the same length.
- Breedlove's research revealed that self-identified lesbians tended to have higher 4d:2d ratios than heterosexual women.

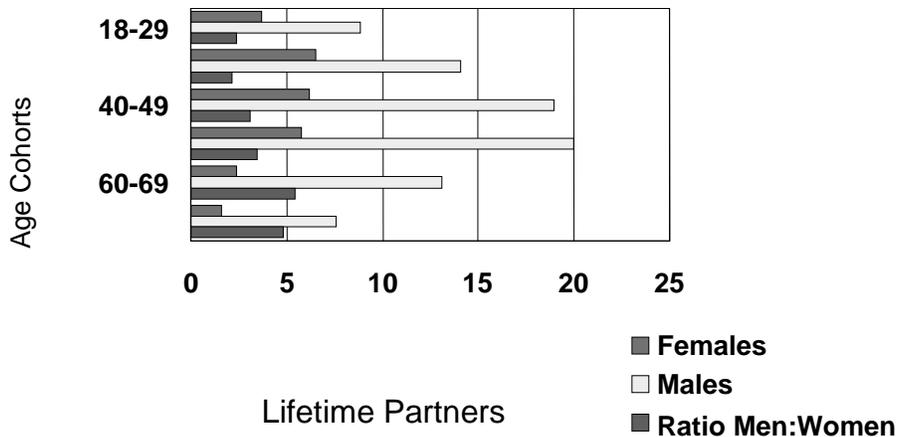
More on Breedlove's Finger Study

- Consistent with other research Breedlove found that self-identified gays were much more likely to have two or more older brothers than heterosexual males.
- This pattern seems to be associated with the fact that as a woman bears a succession of sons the levels of placental androgens increase in the fetus.
- Consistent with the lesbian findings, gay males were found to have higher 4d:2d finger ratios than heterosexual males.

Finger ratio study



Lifetime Sex Partners: Gender Discrepancy in Lifetime Number of Sex Partners as a Function of Age



Sexual Selection (I)

- Intrasexual (male-male competition) and the development of weapons
 - Weapons against predators
 - Weapons used against other males (e.g., for feeding territories unrelated to sexual competition)
 - Indicators of male strength and fighting ability (**m-m competition**)
 - Indicators of sexual vigor and quality (**female choice**)

Sexual Selection (II)

- Intersexual (epigamic) or female choice
 - Arbitrary choice (Fisher's runaway process)
 - **Direct benefits**
 - Better genes
 - Better investment (in selves or offspring)
 - Sensory bias