

Ethology 4474: Brief review of recent research into the biological basis of human sexuality. Consider this research still in the phase of provocative hypotheses, but introduces the mind set for the evolutionary biologist's interpretation of the human species.

Evolutionary studies of human sexual behaviors.

The theories of parental investment and sexual selection provide a theoretical basis in which to predict sex differences in human sexual behaviors, particularly in terms of short-term mating - i.e. mating not in the context of a stable long-term monogamous pair bond.

Adaptive benefits of short-term mating in males.

Ancestral males would have benefitted reproductively by copulating with any available and willing fertile female, for example if a male (already pair-bonded) had a short-term affair this would dramatically increase his reproductive potential. This large increase in 'fitness' would outweigh the possible disadvantages of a short-term mating strategy:

- * Possibility of contracting a sexually-transmitted disease.
- * Acquiring a social reputation as a 'womanizer'.
- * Lowering the chances that offspring of a short-term union will survive to lack of parental investment, or due to increased risk of harm by stepfathers.
- * Suffering violence at the hands of jealous mates or relatives.
- * Risking retaliatory affairs by current partner.

If there are clear adaptive benefits of short-term mating by males then we would expect natural selection to favour males who had low thresholds for sexual arousal, would seek out casual sex, who found 'new' females sexually attractive, and would have 'lower' standards for a short-term mate. There are several lines of physical, psychological, and behavioral evidence that support this idea:

Testicle size: Large testes evolve as a consequence of sperm competition - where sperm from several males occupy the female reproductive tract, such competition exerts a selection pressure for the male to produce more ejaculate and hence larger testes are required to make the increased sperm required (Short, 1979).

We would thus expect that species where the male dominates a harem of females (e.g. gorillas) would have no need of plentiful sperm and so small testes would suffice; in species where males are more polygynous and actively compete for fertile females then larger testes would be required. Comparisons of testes size in primates shows that relative to body size, gorillas have testes half the size of humans while the highly promiscuous chimpanzees have testes much larger than humans (Short & Balaban, 1994). Short (1979) argued that on the basis of testes size, ancestral humans were a polygamous primate who tended towards serial monogamy.

Harvey & May (1989) have further suggested that human interracial differences in testicle size (Chinese males have testicles around half as large as North European men and produce ejaculate with much less sperm) may reflect adaptive differences in mating strategies.

Ejaculate content: Baker & Bellis (1995) analyzed ejaculate content and flowback following sexual intercourse in 35 couples who had been separated for variable amounts of time. They found that sperm count rose as a function of time the couples had been apart since their last sexual encounter - males separated from their partners ejaculated nearly twice as much sperm than males who spent all their time with their partner. They also found that males

separated from their partners ejaculated a much higher quantity of 'blocker sperm' which are infertile and act to block rival sperm from another male.

Desire for multiple partners: According to Symons (1979) lust in males acts as a psychological adaptation to gain multiple sexual partners and thereby dramatically increase their reproductive potential. Buss & Schmitt (1993) tested this by asking males how many sexual partners they would like to have within certain time periods. They found that at each time period, males desired more sex partners than women. On average, over the course of a lifetime females desired around 5 sex partners while males desired around 18.

In their review of gender differences in sexuality, Oliver & Hyde (1993) carried out a meta-analysis of 177 surveys of sexual attitudes and behaviour and found that males had considerably more permissive attitudes towards casual sex, they desired a greater number of sexual partners, wanted intercourse more frequently, and masturbated much more often than females.

Rapidity of Intercourse: The less time that elapses between meeting a new female and intercourse is a clear benefit to a male. Buss & Schmitt (1993) asked participants to rate how likely they would consent to sex with an attractive member of the opposite sex depending on different time criteria. They found that at short intervals (i.e. 1 hour, 1 evening etc) males were much more likely to consent to sexual intercourse.

Similarly, Clarke & Hatfield (1989) hired an attractive male and female to approach members of the opposite sex, to say that they found the person attractive and ask them to have sex. Around 75% of the males approached by the attractive female agreed to have sex but not one of the women approached by an attractive man consented.

Lowering of standards: While males and females have fairly high standards for a potential long-term mating partner, standards for a casual sex partner are dramatically reduced in males which serves to increase the potential number of available sex partners. Buss & Schmitt (1993) asked college students to provide information about the minimum and maximum standards acceptable for short-term relationships. While females tended to maintain their standards across all conditions, males were much more likely to accept minimum criteria in a potential partner in a casual sex scenario.

The only criteria that were maintained were in relation to negative female characteristics such as 'low sex drive', 'prudish', and 'need for commitment'. Characteristics such as 'highly promiscuous' were much valued in a potential casual sex partner but not so for a potential long-term partner.

Closing-time phenomena: It is often stated that female attractiveness judged by males in a drinking environment will increase towards closing time. It was assumed that this simply represented the factor of alcohol intoxication. However, Gladue & Delaney (1990) showed that men did indeed rate females in a bar as being more attractive towards closing time, but this was irrespective of alcohol consumption. They argued that as the evening progresses and a male has been unsuccessful in attracting a casual sex partner, he views the remaining women as being increasingly attractive.

Sexual fantasies: Fantasies are not actual behaviours but they can reveal underlying desires which can motivate behaviours. Ellis & Symons (1990) asked 307 students to complete a questionnaire concerning sexual fantasy and arousal. They found the following:

- * Males were significantly more likely to report having sexual fantasies at least once per day and of becoming sexually aroused at least once a day.

- * Male sexual fantasies more often involved multiple partners, and partners with whom they did not know or want to engage in a relationship with.

- * Female fantasies generally involved a single partner whom they were currently or had been romantically /

sexually involved.

* Male fantasies were dominated by visual imagery (especially the genitals and breasts) but female ones were dominated by the personal characteristics of the partner and the emotional context of the encounter.

* Male fantasies rapidly moved to an explicit sexual encounter whereas female ones built slowly and did not always involve explicit genital sexual activity.

* Both sexes reported gaining equal pleasure from sexual fantasies.

The authors argue that these findings may reflect the large sex difference in preference for pornography and romance novels. According to Symons (1979) the mass-market pornography industry has changed little since Victorian times, it is exclusively aimed at males (heterosexual and homosexual); it is overwhelmingly visual; involves many different youthful and attractive partners, and provides instant sexual gratification without the need for emotional commitment. Romance novels however are aimed directly at women and are fundamentally about mate selection, emotional bonding, commitment and typically do not contain explicit sex scenes. This may also be why women do not purchase female-oriented visual pornography (which tends instead to be bought by gay men) and men show little interest in romance novels.

Extramarital affairs: In most human cultures, males pursue extramarital sex more often than their wives, and suffer less consequences if they are found out - male adultery does not invariably result in divorce but female adultery often does. Surveys reveal an interesting difference in the relationship between marital satisfaction and the urge to have an affair - generally women have to be very dissatisfied with their marriage before they consider an affair, while males generally report that they are not all that dissatisfied with their marriage when they have an affair. The cause of an affair also reveals sex differences with males citing sexual variety as the reason, with females citing the desire for more meaningful interpersonal relationships (Symons, 1979).

The exchange of sex for economic resources (prostitution) occurs in all recorded human cultures with males overwhelmingly being the consumers (for female and male prostitutes). Gift-giving is not exclusive to prostitutes, as males generally provide gifts and economic resources within a relationship in exchange for sexual favours (this is also observed in chimpanzees as males trade meat for sex). Other aspects of the sex industry (such as strippers and escorts) are almost exclusively male-driven.

Adaptive benefits of short-term mating in females.

According to sexual selection and parental investment theories females would have little to gain (and much to lose) from a short-term mating encounter. They do not increase their reproductive potential and can lose a great deal:

* Rejection by her current mate, which may also entail an increased risk of violence from him.

* Loss of resources and protection by her partner.

* Gaining a 'bad' social reputation of promiscuity which can affect their desirability as a potential long-term mate.

* Increased risk of unplanned pregnancy.

* Increased risk of sexually transmitted diseases.

Natural selection would thus have favoured females who did not become easily sexually aroused as this would compromise female choice. However, for every male who is engaging in a short-term relationship, there must of course be a female who is doing the same; ancestral males would not have evolved promiscuity if females were

uninterested in casual sex, therefore short-term relationships must also have some adaptive benefits to females.
Evidence:

The female orgasm and conception: Following intercourse, approximately 35% of the deposited sperm is discharged from the female reproductive tract within around 30 minutes. An orgasm primarily serves to draw the sperm into the cervical canal and uterus increasing the chance of fertilisation. Baker (1996) reported that women are much more likely to have an orgasm when engaged in an extrapair copulation (EPC). When having an affair, women appear to unconsciously time their copulation's to coincide with the phase of maximum fertility, this did not happen in intercourse with their regular partner (Bellis & Baker, 1990).

Masturbatory orgasm in females reduces sperm retention in subsequent copulation, Baker & Bellis (1995) found that such orgasms were less likely before an EPC than before in in-pair copulation.

There is other evidence that females (unconsciously change their behaviour) around ovulation, Baker & Bellis (1995) found that females would travel further afield (as if searching for another partner) and spends less time with her current partner. Grammer found a correlation between skirt length and proximity to ovulation - the nearer ovulation, the shorter the skirt.

Concealed ovulation: In most mammals oestrus (a period of heightened interest in sex in females) is associated with highly visible signs (physiological and behavioural). In human females (and some other primates) ovulation is concealed and so must have some adaptive significance. Several theories have been proposed with the two main ones being:

1. Infanticide prevention: A common feature of many animals is the killing of children by a male who is not their father, in order to bring a bereaved mother into oestrus. This is obviously very costly to the female and so concealed ovulation could have evolved to confuse male parenthood certainty and therefore ensure that infanticide carries a possible risk for the male.

2. 'Daddy at home' hypothesis: Alexander & Noonan (1979) argued that concealed ovulation was a tactic developed by women to divert males from a sexual strategy of low investment polygamy towards high investment monogamy. They argued that for a man to be assured of his parenthood he needs to remain with his partner when she is most fertile (just before ovulation). If he cannot tell for certain when ovulation is, then he will have to stay with his partner most of the time.

In an evaluation of these theories, Sillen-Tullberg & Møller (1993) argued that concealed ovulation began as a female strategy to allow females to mate with several males and avoid the danger of infanticide.

Once established, concealed ovulation a female could choose a caring male with good access to resources and use concealed ovulation to ensure his continued commitment. She could also seek matings with other males confident that her partner would raise any subsequent offspring as his own. This may also explain why human females have permanently enlarged breasts, in other primates the breasts only develop when full of milk during weaning but show some changes through the ovulatory cycle. If a females' breasts are constantly enlarged, then it is difficult for a male to assess when she has ceased lactation and is ovulating.

Reasons for having an affair: A short-term mating relationship may confer direct genetic benefits in that a short-term mate may provide superior genes compared with a female's regular partner. If her current long-term partner is infertile then an affair will provide an obvious genetic benefit. Another possibility is that by having an affair with a very attractive male, a woman might bear a son who shares these attributes and produces more grandchildren ('sexy son's hypothesis'). In support of this several researchers have found that women who report having many sex partners place a higher than normal premium on attractiveness in their partners (Buss & Schmitt, 1993).

Townsend (1995) surveyed the general sex-lives of male and female students but focused on a group who were highly sexually active. Sex differences in the promiscuous group emerged, while neither wanted to become emotionally involved with their 'one-night stands', the females felt much more vulnerable and rejected after having sex, and desired to have a long-term relationship as much as less promiscuous women. The females also sought evidence from their casual partners that they may invest or commit in the future, while the sexually active males regarded signs on investment very negatively.

Mate-Switching: If a woman's regular long-term partner stops bringing in resources (unemployment), becomes abusive or violent to her and her children, then pursuing short-term mates with the potential of gaining another long-term partner has clear adaptive benefits, for example if the affair is with a high status male, she and her children may gain immediate (and then long-term) economical benefits. Greiling & Buss (under review) analysed the benefits that women perceive as resulting from them having an affair. They found the following:

- * Women reported that having an affair made it easier to break up with her current partner.

- * Having an affair made it more likely that they would find a more desirable partner, particularly in terms of compatibility and resource provision (sexual gratification did not appear to be that important).

- * Having an abusive partner, or one who had also been unfaithful were key factors in the woman seeking an affair.

There will of course be contextual influences on whether males and females decide to engage in short-term mating strategies. Cashdan (1993) pointed out that if a female is in an environment where males are few (in prison) or are of obviously poor quality (drug addicts, unemployed) then she may have to form alliances with several males in order to ensure a supply of resources for her children. To do this she will have to act in a sexually provocative manner, and have several short-term relationships. Females who are surrounded by plentiful males of good quality can instead emphasize chastity and fidelity and engage in long-term relationships (with perhaps the occasional short-term relationship).

References.

Alexander, R., & Noonan, K. (1979). Concealment of ovulation, parental care and human social evolution. In Chagnon, N.I.A., & Irons, W (Ed's), *Evolutionary Biology and Human Social Behaviour: an Anthropological Perspective*. North Scituate: Duxbury.

Baker, R. (1996). *Sperm Wars: Infidelity, Sexual Conflict and Other Bedroom Battles*. London: Fourth Estate.

Baker, R.R., & Bellis, M.A. (1995). *Human Sperm Competition*. London: Chapman & Hall.

Bellis, M.A., & Baker, R.R. (1990). Do females promote sperm competition? Data for humans. *Animal Behaviour*, 40: 997-999.

Buss, D.M., & Schmitt, D.P. (1995). Sexual strategies theory: an evolutionary perspective on human mating. *Psychological Review*, 100: 204-232.

Cashdan, E. (1993). Attracting mates: effects of paternal investment on mate attraction strategies. *Ethology and Sociobiology*, 14: 1-24.

Clarke, R.D., & Hatfield, E. (1989). Gender differences in receptivity to sexual offers. *Journal of Psychology and Human Sexuality*, 2: 39-45.

Ellis, B.J., & Symons, D. (1990). Sex differences in sexual fantasy: an evolutionary approach. *The Journal of Sex*

Research, 27: 527-555.

Gladue, B., & Delaney, J.J. (1990). Gender differences in perception of attractiveness of men and women in bars. *Personality and Social Psychology Bulletin*, 16: 378-391.

Greiling, H., & Buss, D.M. (under review). Women's sexual strategies: the hidden dimension of short-term extra-pair mating.

Harvey, P.H., & May, R.M. (1989). Out for the sperm count. *Nature*, 337: 508-509.

Oliver, M.B., & Hyde, J.S. (1993). Gender differences in sexuality: a meta-analysis. *Psychological Bulletin*, 114: 29-51.

Short, R.V. (1979). Sexual selection and its component parts, somatic and genital selection, as illustrated by man and great apes. *Advances in the Study of Behaviour*, 9: 131-158.

Short, R.V., & Balaban, E. (1994). *The Difference Between the Sexes*. Cambridge: Cambridge University Press.

Sillen-Tullberg, B., & Møller, A. (1993). The relationship between concealed ovulation and mating systems in anthropoid primates: a phylogenetic analysis. *American Naturalist*, 141: 1-25.

Symons, D. (1979). *The Evolution of Human Sexuality*, Oxford University Press.

Townsend, J.M. (1995). Sex without emotional involvement: an evolutionary interpretation of sex differences. *Archives of Sexual Behaviour*, 24: 173-206.