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# The Evolution of Male Homosexuality and its Implications for Human Psychological and Cultural Variations.

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## ABSTRACT

Comparisons of different primate species suggest that male homosexuality evolved along with male cooperation which passed through distinct stages of 1) marking territories, 2) marking submissive males via mechanisms previously used for territorial markings, 3) marking alliances via mutual gestures of dominance and submission. Among humans, exclusive male homosexuals are at the extreme submissive end of a dominant/submissive personality continuum. Individuals at the two extremes of this continuum do not reproduce — extreme dominants because they die in fights, and extreme submissives because they do not attempt reproduction. However, due to the random way genes are combined, the extremes of the continuum continue to appear.

The “hierarchy/cooperation” theory helps explain certain aspects of human homosexuality, and clarifies the debate between “essentialists” and “constructivists.” People in all human cultures share with other primates certain cognitive and behavioral markers of dominance and submission. Also there may be common differences between “pathics” (exclusive homosexuals) and typical males in all cultures. Finally, recent studies of bisexuality from non-European cultures clarify how the hierarchy/cooperation theory helps explain why cultures vary so widely in behaviors and definitions of homosexuality.

**KEY WORDS:** homosexuality and culture, dominance hierarchies, primate sexuality, evolution of sexuality, bisexuality

## EVOLUTIONARY THEORIES FOR MALE HOMOSEXUALITY

In the past few decades, evolutionary psychology has demonstrated its value in accounting for human behaviors and inspiring new ideas to be tested. An evolutionary view of male homosexuality may also contribute to many current debates regarding the nature (and culture) of human homosexuality. As with all evolutionary theories, there are at least two questions that must be answered. First, we must explain how homosexual orientations could survive and/or reproduce in light of selection pressures. This is the question of adaptation. Second, any evolutionary explanation must also clarify how a given trait could have arisen. No matter how adaptive a trait

may be, it must have a traceable past. This is the question of phylogeny. I will examine separately each of these questions.

### **Adaptation and Male Homosexuality**

There are at least three different levels at which homosexuality may be seen as adaptive, and each of these levels has its own implications with regard to how homosexuality manages to continue among humans. At the most abstract level, homosexuality might be unrelated to genetic differences or to universal genetic programs that regulate ontogeny. Instead, homosexuality may be culturally determined in a manner far removed from direct genetic influences. Following Dawkins' (1976), we might call this the "memic" level. At a less "abstract" level, we might assume that homosexuals and heterosexuals have the same genes, but that during ontogeny universal genetically determined "programs" get "switched on" or "switched off" depending on environmental influences. Thus, people may have the same genotypes, but these genotypes may produce different phenotypes in different situations. This might be called the "epigenetic" level. Many theories (including Freudian ideas) about the psychological dynamics behind homosexuality are of this type. Finally, at the most concrete level, we might posit genetic differences between homosexuals and heterosexuals. I'll call this the "genetic" level. Many biological studies seem to support this view.

Evolutionary arguments have been offered for all of these levels. For example, Symons (1979) argues that homosexuality results from a meme that takes advantage of the inborn male propensity to find sexual variety interesting. Normally this propensity would be adaptive because it would encourage males to attempt sexual relations with many women, which would result in more offspring. But a meme could parasitize this propensity, redirecting sexual interest to non-adaptive objects, as in fetishism or homosexuality. Epigenetic arguments have been inspired by work on pre-natal hormones. Dörner and his colleagues (Dörner et al. 1980; LeVay 1994) link stress during pregnancy to hormonal effects on the fetus that would lead to homosexuality. This could be part of a mother's adaptive reproductive strategy. That is, in times of stress, when it is difficult to raise children, it may be adaptive to have some homosexual children who could help their siblings raise offspring instead of having offspring of their own. Finally, studies of gene linkages have pointed to genetic differences between male homosexuals and heterosexuals (Hamer et al. 1993; Mustanski et al. 2005). Various evolutionary theories have been proposed to account for genetic arguments.

Whether genes lead directly to homosexuality or whether they simply program for homosexuality under certain environmental conditions, they would still undercut reproduction. Thus, the basic question for genetic and epigenetic arguments is to account for how such genes could survive the pressures of natural selection. Several hypotheses have been proposed. First, a maladaptive gene might re-occur repeatedly in a population if it results from the frequent mutation of a gene that is normally adaptive. However, people with maladaptive genes rarely exceed 1% of the population, while male homosexuality apparently occurs much more frequently (Whitam and Mathy 1986; Gadpaille 1980; Diamond 1993). Another possibility is that genes that lead to homosexuality might have hidden advantages. For example, homosexuals could directly help their relatives (who share the "homosexual" genes) raise more children. Nevertheless, cross-cultural research shows that, although male homosexuality is somewhat more common in patrilocal societies, it is not more common in societies with endogamy or extended families where homosexuals live closest to their relatives and so could presumably most help them (Werner 1979).

A second theory argues that a gene that is especially advantageous for females might inadvertently cause homosexuality in males. According to this argument, the female relatives of male homosexuals should be especially successful in their reproduction. I know of no empirical studies for this hypothesis.

A third theory argues that genes "for homosexuality" might be maladaptive by themselves, but might be advantageous when combined with other genes. This latter scenario is sometimes known as the "heterozygous" "hybrid vigor" or "heterosis" hypothesis (LeVay 1994; Sommer 1990). What, then, might be the advantage of homosexual genes when combined with heterosexual genes? Kirsch and Rodman (cited in Sommer 1990) suggest that this advantage may have something to do with dominance hierarchies. The maintenance of these hierarchies presumably helps animals, including humans, live peacefully together, and this peaceful living provides advantages to the group, and to the individuals in the group. The heterosis argument suggests that homosexuality results from genes for submissive behavior. But the key to the argument is the disadvantage of an animal that has only dominance genes. While an animal possessing only submissive genes would fail to reproduce for lack of trying, one possessing only dominance genes might also fail. After all, an animal that "fights and runs away, lives to fight another day," but an animal that never gives in often dies young. In this light, consider Chagnon's (1988) discovery that Yanomami men who had killed more enemies had more offspring than milder men. Chagnon used this correlation to argue that aggressivity really does enhance reproductive success. But Chagnon's study suffers from a sampling problem — It included only living males. Very possibly the more aggressive males also had a greater probability of dying before ever being able to reproduce at all! Thus, on average, milder men may have as many or more offspring than aggressive men.

According to the heterosis argument it is the males with a mixture of dominant and submissive genes, who would most likely reproduce. By genetic laws, this would leave every generation with a certain percentage of individuals at the extremes. For example, if each of a pair of chromosomes had only one "homosexual" locus with only two possible alleles (one for dominance and one for submissiveness) this would leave a heterozygous couple with 25% of their offspring homozygous for submissiveness, 50% heterozygous, and 25% homozygous for dominance. If, however, homosexuality were the result of the interaction of many genes, possibly spread across different chromosomes, then fewer individuals would have only submissive genes. Of course there are many possible genetic scenarios for this argument. Indeed, different genes may affect different aspects of homosexuality, as new research is beginning to suggest (Mustanski et al. 2005).

The heterosis argument still needs to be tested. It predicts, for example, that the relatives of exclusive homosexuals should have less dominant personalities than the general population, in addition to predicting that homosexuals themselves would be more likely than heterosexuals to avoid fights (at least physical ones), for which there is already abundant evidence (Whitam and Mathey 1986; Cardoso 2004).

### **Phylogeny and Male Homosexuality**

Many evolutionists (Gould 1977b; Rieppel 1992; Reichholf 1992; Antinucci 1990) have complained about the emphasis placed by sociobiologists on natural selection to the detriment of questions of phylogeny. According to these authors, sociobiologists have an overly "atomistic" approach to evolution, acting as if specific biological traits can evolve all by themselves, without regard to structural constraints on design or to the possibility that given changes may or may not be possible in phylogenetic history. Tracing phylogeny is important because natural selection does not operate like an engineer, drawing up a blueprint, and then constructing a machine from scratch in the most efficient way possible. Rather, natural selection operates more like a "tinkerer" taking advantage of materials already available to produce new forms that "work" at the moment. Elsewhere (Werner 1999b) I argued that adaptational arguments (like functional arguments in general) are more common in the Anglo-Saxon academic world, while phylogenetic arguments (like structural arguments in general) are more common among continental academics. A more balanced perspective is in order.

The heterosis theory of homosexuality proposes that genes that affect submissiveness also affect homosexuality. This suggests that the key to understanding homosexuality may lie in the evolution of submissive behavior. We are unlikely to find many clues in the fossil record, but a search for homosexual analogues and homologues in other animals may be informative. Sexual relations between males can be found even in very simple species. In his review of animal homosexuality, Sommer (1990) mentions the case of "homosexual rape" in a parasitic worm (*Moniliformis dubius*). In this case, the raped male's genital opening is blocked off with a spermless semen plug donated by the rapist. The raped male cannot then fertilize females. A variation on this theme is the homosexual rape of the bedbug *Xylocaris maculipennis*. In this case, instead of blocking up the rival male's genital opening, the raping male inserts his own sperm into the rival male's semen ducts. This also occurs with fresh water snails of the genus *Biomphalaria*, which are vectors for schistosomiasis (Forsyth 1991). When the raped male copulates with a female, he fertilizes her with his rival's sperm.

Very different is the "homosexual" behavior found in the ten-spined stickleback fish. During spawning activities the male must court a female in order to get her to lay her eggs. Sometimes a second female is invited into the courting arena, and then the male may succeed in fertilizing the eggs of two females. But sometimes the second "female" is really a transvestite subordinate male, who, because of his disguise, succeeds in entering the rival's arena and fertilizing himself the female's eggs, or he may simply eat the already fertilized eggs (Sommer 1990). A variation on this theme is found in the bluegill sunfish. In this species there are three different types of males. First is the larger "parental" male, who defends a nest or courting arena. Second, is the much smaller "sneaker" who sometimes succeeds in darting into a parental's courting arena and fertilizing the female's eggs before the larger male perceives him. Third are the "transvestites" who resemble female bluegill sunfish, and manage to get invited into the arena (Wilson 1994). As they grow, the "sneakers" gradually turn into "transvestites," but the "parental" males are genetically different. That "transvestite" behavior may also be structurally related to homosexual activities is shown in the case of the lizard *Anolis garmani*. In this animal the main perceived difference between males and females is size. Small males are usually driven out of the territories of larger males, but much smaller males are sometimes confused with females. On entering a more dominant male's territory, these small males behave like females and let themselves serve as sexual partners to the larger males. This trick not only gives the subordinates access to the dominant's territory and to his females, but also succeeds in making the dominant male "waste" his sperm. A similar ploy is used in forest salamanders — subordinates succeed in tricking dominant males into giving up their sperm packets (Sommer 1990), and by male Manitoba garter snakes (*Thamnophis sirtalis parietalis*) that give off female scents that attract other males into giving up their sperm.

Some of these examples of "homosexuality" in phylogenetically distant animals may be analogous rather than homologous to human homosexuality, but as we move closer to humans the likelihood of homologous behaviors increases. In mammals many different behaviors have been observed that might be associated with male homosexuality. Among primates homosexual behaviors are particularly diverse. These include such practices as the mounting of one male by another (e.g. langurs, pig-tailed macaques, baboons, orangutans, chimpanzees, bonobos) (Sommer 1990; Oi 1990; Lorenz 1963; Yamagiwa 1992; Hayaki et al. 1989), including mounting with anal penetration (e.g. stump-tailed macaques, squirrel monkeys) (Sommer 1990; Maple 1977), and mounting with anal penetration and ejaculation (Japanese macaques, rhesus macaques, gorillas) (Sommer 1990; Gadpaille 1980; Edwards and Todd 1991; Bagemihl 1999). Masturbation of other males has also been reported, including mutual masturbation (e.g. stump-tailed macaques) (Sommer 1990) as well as genital-genital contacts (e.g. bonobos) (Enomoto 1990), at times leading to ejaculation (e.g. gibbons) (Edwards and Todd 1991). Fellatio has also been reported for stump-tailed macaques (Sommer 1990). Other perhaps related behaviors include sniffing/inspecting the genitals/anal region of other males (e.g. stump tailed macaques,) (Sommer 1990), "displaying" an erect penis to other males (e.g. vervet macaques)(Henzi 1985), and urinating a few drops on the other male

during the display (e.g. squirrel monkey)(Castell 1969). In some cases males have shown a preference for their homosexual partners over heterosexual partners (e.g. rhesus macaques) (Sommer 1990).

These behaviors have been reported for a diversity of situations — most notably in displays of dominance and submission, in cases of general excitation, and in more playful situations among adolescent males and between adult males who demonstrate special affective relationships with each other.

At first glance the relationships between the different behaviors and the situations in which they occur seem arbitrary. For example, in some cases it is the dominant or older male who mounts the younger or subordinate (e.g. observations among gorillas) (Yamagiwa 1992), in other cases it is the reverse (e.g. pig-tailed macaque) (Oi 1990). Presenting the anal region to another animal may indicate one's dominance (e.g. squirrel monkey) (Ploog et al. 1963), or it may be a submissive gesture (e.g. baboon) (Lorenz 1963). It may be the dominant who sniffs/licks the subordinate adolescent's genitals (e.g. howler monkeys) (Young 1983), or the subordinate who sniffs/licks the dominant (e.g. Hapalidae) (Epple 1967). It may be the dominant who ejaculates (e.g. squirrel monkey) (Ploog et al. 1963) or the subordinate adolescent (e.g. gibbons) (Edwards and Todd 1991). In some cases it is the dominant individual who urinates (e.g. squirrel monkey) (Castell 1969). In some cases the reverse (e.g. a subordinate wolf may urinate on itself)(Lorenz 1963).

The different sexual activities and their social associations seem so diverse that it is tempting to conclude that more complex animals have simply evolved a "flexible" sexuality that allows them arbitrarily to find virtually anything sexy. Indeed, phenomena like the occasional sexual imprinting on different species or even on objects would seem to confirm this view (Maple 1977; Lorenz 1963). In light of this diversity Bagemihl (1999, p. 261-262) simply eschews all attempts at explanation, and prefers instead to exalt in a "biological exuberance" which "embraces paradox," and "is about the unspeakable inexplicability of earth's mysteries." Still, I think it possible and profitable to search for order behind this chaos. We just need to look a little more closely at the situations in which these behaviors occur.

I propose that male homosexuality evolved through various stages. The most primitive stage occurs in animals without multi-male groupings, and where males are generally intolerant of the presence of any other adult male. In this stage, homosexuality is basically a deception tactic to gain access to others' territories (although the animals may not know they are practicing deception or being deceived). This is the stage of the "transvestite" lizards and snakes described above. Possibly such transvestite behavior may be a pre-condition for the use of sexual "mounting" to express dominance in more complex animals. The connection may have something to do with how males succeed in imitating females. Lorenz (1963) gives the example of *Cichlid* fish. Males recognize females only by the fact that females can mix the emotions of fear and sexual excitement while males cannot. He argues that many vertebrates distinguish between the sexes only by the different ways males and females mix basic emotions. Allowing oneself to be sexually mounted is then associated with submission.

A more complex stage of homosexuality occurs where multi-male groups are adaptive, perhaps in avoiding victimization from predators or for other reasons, but where males do not cooperate with each other on specific tasks. In this situation, more powerful males may have reasons to expulse other males, but they also have an incentive for allowing them to stay. The "solution" to this dilemma is the maintenance of a clear dominance hierarchy. The subordinates may stay in the group, but must periodically "pay homage" to the dominant to clarify their provisional "guest" status. The rituals used to define this dominance may derive from various sources. One source is the behavior used to mark off territories. Many animals have scent glands (often near the genital-anal region) that take advantage of urine or feces secretions to deposit scents on a territory's

borders or elsewhere. When subordinate males are allowed to stay near a dominant male, part of the price may be having these territorial markers literally "rubbed in their faces". For example, Epple (1967) describes the genital displays (perhaps best described as "mooning") among dominant males in different *Callitrichidae* species. In *M.a. argentatus* the dominant male, with a threatening face, shows his anal-genital region to a subordinate, who crawls to him with gestures of anguish, while emitting submissive sounds, and then smells the dominant's genitals. When extremely fearful, submissive males may smell only the dominant's tail. Sometimes the dominant male backs into the submissive and rubs his genitals in the submissive's fur, thus marking the subordinate directly with his own markers. Often the dominant withdraws his testicles, but shows an erection during these displays. The dominant's erection may serve to clarify that he is allowed to have an erection (and sexual relations with females), and the subordinate must get used to seeing this. The subordinate is not permitted this license.

Squirrel monkeys have similar, but somewhat more complex dominance rituals. The dominant male approaches a subordinate, opens his thighs (sometimes while touching the subordinate with his hands and/or penis) and "displays" his erect penis in the subordinate's face, sometimes emitting a few spurts of urine in the process. The subordinate usually hunches over and may succeed in turning his face away from the display, but if he does not remain sufficiently passive or tries to move away, the dominant may become enraged and aggressive (Castell 1969; Ploog et al. 1963). The relationship between these displays and sexuality involves more than just the fact that erect penises are being displayed. Among mouse lemurs, for example, exposure to the urine of an active dominant male reduces the testosterone level of adult males (Stoddart 1990), which plausibly may reduce their sexual activities — Male prairie voles, exposed to male urine, delay their sexual maturation (Forsyth 1991). At least for the squirrel monkey, there is clear evidence that the subordinate animals engage in less sexual activity (Ploog et al. 1963).

In its genital displays, the squirrel monkey is very similar to the *Callitrichidae*. But the squirrel monkey has a more complex repertoire. In addition to genital displays, dominants also demonstrate their status by mounting submissives, including anal penetration. Possibly, an ancestral "transvestite deception" system combined with a "scent-marking" system to produce the squirrel monkeys' dominance rituals. Or perhaps the ancestral shows of erect penises simply become more explicit. In any case, the squirrel monkey's dominance system also has other novelties. Dominant males sometimes "ask" other males to stay. They do this by rolling on their backs and exposing their bellies, sometimes showing an erect penis. Animals that would normally run away stay around if the dominant performs this ritual. This makes for a slightly more cohesive male group than occurs among the *Callitrichidae*.

A particularly dramatic variant of the genital display is found in vervets (Henzi 1985). Vervets have bright red penises with powder blue scrota. During submissive gestures, males retract both their penises and their scrota into their bodies, while the dominants leave both extended. In one display, the dominant walks or runs toward the submissive and then turns perpendicular to him so the submissive can observe the dominants' genitals, which the submissive always does. In another, the dominant circles around the submissive showing his anal/genital region, sometimes holding on to the submissive during the display. In addition to these non-solicited displays, the submissives sometimes seek out the dominants in order to "pay homage" to them. They do this by submissively running after them, or creeping up to them, and at times cupping the dominant's testicles in their hands and tugging. Both dominants and submissives have been observed with erections during these latter rituals. Other multi-male species also show "homage-paying" behavior. Lorenz (1963) describes an incident in which a defeated baboon chased after his conqueror "presenting" his behind until the dominant finally mounted him. This may help explain why, among white-handed gibbons, an adolescent was observed soliciting sexual contact with the adult male in his family group. As Edwards and Todd (1991) suggest, the youth may have needed "reassurance" that he was still welcome in the family.

I think the different rituals of the *Callitrichidae* versus the squirrels, and vervets reflect different levels of male/male cooperation. Compared to the *Callitrichidae* example, the observations among the other two species seem to have been of clearer, more stable hierarchies. Among the vervets the dominants were confident enough that they could leave their testicles descended during the displays while the *Callitrichidae* brought them out of harm's way. Squirrel monkeys have been observed inviting fearful subordinates to stay around, and allowing them to show erections which suggests more value given to maintaining the multi-male groups.

The stability or instability of dominance positions may help explain some of the apparently "contradictory" rituals reported by ethologists. For example, among pig-tailed macaques submissives have been observed mounting the dominants more than the reverse (although it is the dominant who solicits this behavior). Yet immediately after a new monkey rises to the top, it refuses to let others mount it. This may be because this is an especially unstable moment when doubts about hierarchical positions need to be affirmed (Oi 1990). Dominants, when secure in their positions, may profit by "ceding" to submissives at times.

In many of these primates immature males seem to "practice" these dominance rituals, displaying or presenting to each other and allowing their partners to mount them (e.g. vervets, rhesus, gorillas, orangutans). This youthful play may be the beginning of what in even more socially complex species becomes an affective type of adult homosexuality, in which neither partner is dominant to the other. "Neoteny" is a common way for "new" traits to appear in a species (Gould 1977a). Adult bonobos, for example, often cement alliances with homosexual activities (Waal 1989).

By way of conclusion, there are a few important points to be made about primate homosexuality. The first is that, in most cases, the homosexual behavior has a pacifying effect — averting aggression, reassuring subordinates of their place, or cementing alliances — although a forced homosexual display may also represent a challenge during a hierarchical dispute. Also, the different forms of homosexuality seem to "scale", that is, the behaviors and associations found in the simplest species are also found, under certain circumstances, in the more complex animals. But the more complex animals have some additional complications not present in the others. If this scaling is correct, then this suggests that homosexuality is closely tied to the evolution of more complex social behavior — probably due to its effect in reducing hostilities between males.

Although some authors (e.g. Kirsch and Rodman — cited in Sommer 1990) emphasize only dominance hierarchies in the origins of proto-homosexual behaviors, these hierarchies should probably be seen as only one act in a longer play that begins with territoriality and deceptive "transvestite" tactics and ends with alliance formation and affection. This is a play about how animals came to cooperate with each other, and about the origin of society. I can see no reason for not adding an encore for human homosexuality. Humans are certainly much more cooperative than other animals, and our society is much more complex. What does all of this imply, then, about human homosexuality?

## **IMPLICATIONS OF THE HIERARCHY/COOPERATION THEORY FOR HUMAN HOMOSEXUALITY**

Before seeking evidence for the hierarchy/cooperation theory among humans, it is necessary to clarify questions surrounding one of the major academic debates of the last two decades — the "essentialists vs. constructivists" (See Cardoso and Werner 2004 for a brief historical review of this debate.) "Essentialists" postulate more universal biological and psychological bases for homosexuality, while "constructivists" see "homosexuality" as having no meaning whatsoever outside of its cultural context. Supporting an "essentialist" viewpoint, most biologists cite evidence

for genetic and epigenetic causes of homosexuality, while psychologists point to the common childhood precursors, and common personality and cognitive traits of homosexuals. To support a "constructivist" view anthropologists and social historians cite the great variation across human cultures in the ways homosexuality is organized or defined. A brief summary of the evidence for these views may help clarify the debate.

### **"Essentialists": Biologists and Psychologists**

Biological studies have documented differences between male homosexuals and heterosexuals in their exposure to prenatal hormones (LeVay 1994; Reinisch et al. 1991), brain structures (LeVay 1994; Swaab and Hoffman 1990), genetic markers (Hamer et al. 1993; Mustanski et al. 2005), and possibly other characteristics such as fingerprint patterns (see Downtown 1995 with regard to a University of Western Ontario study), that may be related to testosterone exposure (Jamison, et al. 1993). In addition, effeminate boys (who have a strong tendency to become adult homosexuals) are judged more attractive than other boys (Zucker, et al. 1993) which agrees with Green's (1987) finding that parents of effeminate boys rated these as more "beautiful" babies than their other children.

Blanchard & Sheridan (1992) found that homosexual men had more older siblings than nonhomosexual men, and other studies found homosexual males had more older brothers than heterosexual males (Blanchard 2004; Blanchard & Klassen 1997; Cardoso 2004), possibly reflecting a progressive immunization of some mothers to H-Y histocompatibility antigen. Other researchers (Dörner et al. 1980; Cardoso 2004) found that the mothers of male homosexuals may have suffered more maternal stress during pregnancy.

Finally, support for genetic arguments has come from studies of twins and of homosexuality in family histories (Whitam 1983; Bailey and Pillard 1991; Buhrich et al. 1991; Eckert et al. 1993; Pillard and Weinrich 1986; Flores 1994; Cardoso 2004). Anecdotal evidence from tribal level societies also suggests inheritability of homosexuality — Wilbert (1972, p. 101) reported that the Warao Indians of Venezuela think that transvestites are more common in some of their families than in others.

The most complete and careful study of family relationships and homosexuality is Green's (1987) fifteen-year comparison of effeminate and masculine boys beginning from the time the boys were four to twelve years old, and continuing into adulthood. The boys and parents were interviewed and observed regularly over this time period, and psychological tests were administered at various points. Of 30 feminine boys accompanied throughout this period and with sexual experiences, 24 were "more than incidentally homosexual" as adults. Of the 25 "masculine" controls, only 1 was more than incidentally homosexual as an adult. Many of the effeminate boys were subjected to behaviorist or other therapies during their childhood, all apparently without effect on their later homosexual behaviors or fantasies. In addition, although a good deal of attention has been given to the role of parental child-rearing behavior, neither Green nor others (Greenstein 1966; Siegelman 1974; Green 1987) found much support for these arguments.

However, childhood gender non-conformity consistently predicts adult homosexual orientations in North America and Europe, as well as other cultures (Phillips and Over 1992; Cardoso 1994; Green 1987; Whitam and Mathy 1986; Whitam and Zent 1984). While homosexuals are more likely to have been effeminate as boys, there are still many homosexual males who have reported more normal childhoods (Phillips and Over 1992). Weinrich and his colleagues (cited in LeVay 1994) showed that it is the homosexuals who prefer a more "passive" role (as "insertee") who are most likely to have been effeminate boys. These findings have led researchers like Green to propose causal models for homosexuality that begin with the influences of genes and pre-natal hormones.

Characteristics of parents (like the desire for a girl or a boy) might affect acceptance or tolerance of feminine behavior in boys, which in turn might affect their adult femininity, but have less effect on their homosexuality.

### **"Constructivists": Anthropologists and Historians**

Most anthropologists and historians feel frustrated with the biological and psychological work on male homosexuality because it seems to account so poorly for the cross-cultural variation in male-male sexual relations. This variation is so great that it seems impossible even to **define** homosexuality in a cross-culturally meaningful way. To find **causes** that are cross-culturally valid seems preposterous. For example, Dickemann (1993) cites the case of homosexuality in medieval Europe. She argues that during the period of Charlemagne parents simply decided that their last-born son should adopt homosexuality, and apparently the parental decisions were followed. When we consider the even more "exotic" cultures of New Guinea (Herdt 1993; Kelly 1974), the arbitrariness of cultural definitions of homosexuality seems even clearer. In societies like the Sambia or Etoro, all boys are expected to have sexual relations with older males. Indeed, people believe that the boys' maturation would be impossible if they did not receive semen from the older males. Among the Etoro sexual relations between men and women are taboo most days of the year, although homosexual relations are constantly encouraged.

### **Compatibility of the essentialist and constructivist views**

If there is no such thing as "homosexuality" in a cross-culturally meaningful sense, then what should we make of the biological findings? I think there are two possibilities. First, the biological findings may be peculiarly Western. That is, there may be no gene for "homosexuality," but rather genes for other characteristics that our particular culture associates with "homosexuality." For example, parents may define certain inborn facial features as "beautiful" in their babies. This may lead them to treat these babies as more delicate and "feminine" than other babies. It is the later "femininity" of these boys which then gets defined as "homosexual."

I think a more likely possibility is that the cultural differences are not really so great. The apparent incompatibility between the biological and cultural arguments may simply be a question of their dealing with different phenomena. Biologists are more interested in sexual orientation — what sexually attracts individuals or is behind their fantasies. On the other hand, anthropologists are more interested in sexual practices — that is, who has sex with whom, and what people actually do in these sexual relations. Anthropologists are also extremely interested in sexual identity — how cultures define individuals, and how individuals see themselves. In both practices and identity there is certainly a great deal of cultural variation. But we know much less about the cross-cultural variation in orientation as defined here. The differences among these concepts are not always clear in the works of different scholars. For example, Herdt (1993 p. xlvii) states that "Identity includes feelings, ideas, goals and sense of self." Money and Ehrhardt (1972) often speak of sexual "identity" without distinguishing this from "orientation" and without considering the influence of culture in forming these identities.

Evolutionary psychologists tend to emphasize what is universal to all cultures, while cultural anthropologists generally concentrate on what is unique. To resolve the discrepancies between "essentialists" and "constructivists," I think the most productive approach is to examine those cultural features that are common to **some** cultures but not to others. One typology, originally suggested almost 40 years ago (Gorer, 1966), groups cultures into one of three male homosexual systems— "gender-stratified systems," "age-stratified systems," and "egalitarian systems."

By far the most common homosexual system in the ethnographic record is the "gender-stratified system" in which typical males may engage in active (insertor) sexual relations with distinctly identified "pathics" who generally assume passive (insertee) roles. The pathic (often a transvestite) might take on an honored religious role as among the South African Zulu or the Patagonian Tehuelche, or he may be mistreated as among the Angolan Mbundo, or the Bolivian Chiriguana, although his active partner receives no rebuke. He might eventually assume the role of a second or third wife of a typical male, as among the Warao of Venezuela, the Tanala of Madagascar, the Karen of Burma, or the Chukchee of Siberia, or he might serve various men in the community throughout his lifetime as among the Brazilian Tupinamba. Just how often typical men in these societies participate together in sexual escapades with the pathics is unknown, but judging from a few ethnographic reports and drawings of the "dance to the berdache," such "partying" may not be rare (Katz 1976; Werner 1999a). Murray (2000) coded 120 societies as "gendered-stratified."

"Age-stratified" homosexual systems include "mentorship" or "ritualized homosexuality" systems, in which an older male takes on a younger male as an "apprentice," as well as "catamite" systems in which younger males serve simply as sexual objects to a powerful, older male. "Mentorship" systems have been found among groups as diverse as the ancient Greeks, Australian Aborigines, numerous New Guinea cultures, Tibetan monks, Japanese samurais, Egyptian Siwans, and the Zairean Azande. They are remarkably similar in many respects. Boys may begin their initiation/apprenticeship as young as 7 years as among the New Guinean Sambia, or as old as 12 among the Azande, and may continue their apprenticeship until as old as 20 or 25 as among the New Guinean Etoro. After this age, young men generally switch to more active roles with younger boys. It is very common for a father to choose carefully his son's tutor, and in most, if not all cases, the relationship between the two is monogamous, and involves instruction in practical matters as well as moral courage and discipline (Werner 1999a). "Catamite" systems were quite common in the Hellenistic empire as well as other societies, such as ancient Rome, China, Korea, Japan, Egypt, Turkey and the African Ashanti. Among the West African Mossi, chiefs had sex with boys on Fridays when sex with women was taboo. In some cases the boys were simply kept as slaves, while in other cases they traveled with theatrical troupes and served as prostitutes as well. Murray (2000) coded 53 societies as "age-stratified."

"Egalitarian" homosexual systems include societies a) where homosexual relations occur among typical males only during adolescence, b) where "blood-brotherhoods" may formalize homosexual ties between typical males throughout life, and c) where homosexually identified males have sex primarily with other homosexually identified males (the modern "gay" system). "Egalitarian" systems are relatively rare in the anthropological record. Murray (2000) coded only 30 societies as "egalitarian." And "gay" systems may be limited to Northern Europeans and their descendants of the past few centuries, which is probably what most social constructivists (e.g. Foucault 1978) are talking about when they refer to the recent cultural construction of "homosexuality." Still, it is the "gay" system which most non-anthropologists have in mind when they talk about homosexuality. The "gay" system seems to be gaining ground in many countries of the world. For example, Murray and Arboleda (1995) noted changes over time from "gender-stratified" to "gay" systems in Guatemala, Mexico, and Peru. In the 1970s, only 50% of their informants had heard of the term "gay," and only 23% thought it referred to both "passive" and "active" partners. In the 1980s, 76% had heard of the term and 58% applied it to both "passives" and "actives." Cardoso's (2004) data from Thailand, Turkey and Brazil showed that the "gender-stratified" system is most common among the lower classes in each of these cultures, while the professional classes generally adhere to the "gay" system<sup>1</sup>.

Most societies can be classified as adopting one or the other of these homosexual systems, but different sectors of a culture may adhere to different systems, and at times even the same sector may recognize different systems. For example the ancient Greeks had "mentorship" systems of homosexuality, but also recognized pathics with distinct terms, and prohibited them from holding

public office (Murray 2000). The Australian Murngin also recognized pathics as distinct from other males, although a "mentorship" form of homosexuality also characterized their society. In addition, homosexual behavior may also occur at other moments within a society – such as among prisoners, in street gangs, or to humiliate enemies in warfare (Duerr 1993).

It is important to recognize that most of the cultural variation in homosexuality refers to the homosexual behavior of typical males, not to the sexual orientations or even social identities of homosexually identified males. Thus, it is entirely possible for researchers to acknowledge the cultural "construction" of homosexual behaviors among typical males, while still recognizing that homosexuals (pathics) share "essential" traits in all known human societies.

## **Implications for humans of the hierarchy/cooperation theory**

What kinds of evidence might support or refute the "hierarchy/cooperation" argument for homosexuality? There are three questions for which evidence may be forthcoming. First, the theory makes predictions about deeply rooted feelings in all humans. Second it may account for individual variation in all cultures. Third, it may help explain why cultures vary.

### **Universals**

If the association between cooperation and homosexuality is correct, then we should expect humans to show more homosexuality than most other complex animals, with the possible exception of bonobos, who, as Wrangham and Peterson (1996) argue, may be even more cooperative and more homosexual. I think humans do practice more homosexuality, although an over-concentration on North European cultures and an over-concentration on genital-sex may sometimes confuse the issue.

The review of animal homosexuality suggests that more complex animals add new complexities to the already existing repertoires of simpler species, yet they still retain the older repertoires. We should, thus, find evidence of these older repertoires in humans. This makes sense in terms of the "tinkerish" economy of natural selection. As modern neuroscientists have pointed out (Damasio 1994; LeDoux 1996), the human brain is constructed in "layers." The phylogenetically inner layers are more conservative, varying less from one species to the next, in conformity with the great dictum of natural selection: "If it ain't broke, don't fix it". The outer layers are more recent, and vary more from one species to the next and from one individual to the next (Cairns-Smith 1996). Thoughts or perceptions organized in the outer layers need to produce their effects by acting through the inner layers. For example we may reason our way (using the outer brain layers) into a fearful state (produced in the inner layers), or may similarly reason our way out of a fearful state. However, when the different regions of the brain are in disagreement, feelings may be less "convincing" (Damasio 1994; LeDoux 1996). When they all agree, they may be perceived as especially powerful or "raw."

The differences are seen even in language. As etymologies show, our abstract concepts are almost always constructed from analogies with more concrete phenomena, and children learn concrete concepts long before they are able to make abstractions. Swear words are especially concrete. Unlike other language capacities, swearing has its origins in the phylogenetically older sub-cortical parts of the brain. Brain-damaged individuals may lose their capacity for virtually all language, but still retain the ability to swear (Pinker 1994). Psychoanalysts (e.g. Arango 1989) and anthropologists (Duerr 1993) have taken advantage of this phenomenon to analyze the sources of our most powerful emotions. In the case of dominant/submissive relations our swearing vocabulary is rich and revealing. Primate mounting behavior is revealed in expressions like "he wants your ass," or "up yours!" References to submissive individuals in different languages are consistently

related to primate gestures of submission. In English we call overly submissive individuals "ass kissers" or "brownies." In German and Vietnamese, the expressions are only slightly different: "*Arschkriecher*," and "*NimBa*," respectively, expressing the act of crawling up to the dominant's behind. Spanish speakers say "*lame culo*," southern Slavs "*Dupolizac*", and Russians "*Podliza*" all referring to licking the dominant's behind. The Brazilian term, *puxa-saco* (scrotum tugger), refers to another primate gesture, while Turks use "*Kiçimi yala*" referring to ass licking although they also possess the milder "*Dalkavuk*," referring simply to the subordinate's bowed back. Uruguayans say "*chupa medias*" (literally 'sock sucker'), referring to what may be another scent marker. Other English expressions based on primate-gestures include "rubbing it in", "smearing it in your face", and "sucker." The reader can probably fill in more examples, including some only slightly more abstract expressions.<sup>2</sup>

## Individual Differences

"Dirty words" are helpful in understanding attitudes that may be deeply rooted in all individuals. But in all cultures there may be important differences between people as well. Most anthropological studies have concentrated on general cultural norms, categories, and symbolic systems, not on individual differences. This is unfortunate, because it tells us little about individual variation in homosexual activities for these societies. Often it is difficult enough just to affirm that exclusive homosexuals are absent. For example, Werner (1984) describes a traditional myth about a transvestite among Brazil's Kayapó Indians, but the Indians reported having never heard of a case. On the other hand, Crocker (1990) reports the presence of transvestites among the Kanela Indians of Brazil, but suggests the culture had no tradition of transvestites. One wonders whether cultures simply adapt to transvestites or homosexuals in their midst when they happen to appear.

Anecdotal accounts of pathics in many tribal societies suggest similar childhood backgrounds to Western homosexuals, but more systematic data are extremely rare. Still, statistical studies in a few more complex non-Western societies have confirmed U.S./European findings with regard to the correlations between exclusive homosexuality on the one hand and childhood behaviors or family histories on the other (Whitam 1983; Cardoso 2004).

Even rarer are studies of the psychological and social differences between typical men who do or do not have occasional homosexual relations. Such studies are uncommon even for the U.S. These studies may be particularly revealing with regard to the evolutionary theory postulated in this paper. For example, McConaghy and Blaszcynski (1991) looked at homosexual feelings among males with predominant heterosexual attractions, and discovered that homosexual feelings are most correlated with having disliked outdoor and contact sports. There were no correlations of homosexual feelings with activities like cooking or playing with dolls as a child. Likewise, in his study of 41 men from a Brazilian fishing community Cardoso (1994, 2002, 2005) found that the men most interested in sex with the community's exclusive homosexuals were significantly more likely to have avoided playing soccer as children than were other men who had fewer relationships with the homosexuals. But these men were not different from other men in cross-gender behaviors (like playing with dolls). These findings suggest that submissiveness may be more central to homosexual feelings among typical males than is femininity.

Further clarification of the characteristics of "bisexuals" in different cultures comes from a larger study in which Cardoso (2004) gathered interview and questionnaire data from 880 men between the ages of 20 and 30 in cities in Brazil, Turkey and Thailand. Cardoso chose these societies in order to maximize diversity, including a predominantly Christian, Muslim and Buddhist culture. His sample was stratified to include homosexual, bisexual and heterosexual men from both working and professional classes in each country. Comparisons of "bisexuals" (men who had sex with both males and females) with exclusive heterosexuals was revealing. Bisexuals were intermediate

between heterosexuals and bisexuals on some childhood precursors of homosexuality (like not playing soccer, preferring girl's tasks, playing with girls, or wanting to be a girl), but they were much closer to the heterosexuals than to the homosexuals on these variables. Perhaps more telling, they rated higher than both homosexuals and heterosexuals in "liking to dominate" their sex partner, and "receiving sexual invitations from women." Some of the class distinctions help clarify the meaning of these results. Compared to professional-class bisexuals, the working-class bisexuals were less likely to have preferred girls' tasks, or have wanted to be a girl, and they were actually more likely than working-class heterosexuals to have bullied others when young (Cardoso 2004). Very likely there are two quite distinct profiles of "bisexuals" in the working classes. In Cardoso's sample of working class bisexuals, those who liked to bully also liked to dominate their sex partner ( $r=.50, p<.001$ ), but they were not more likely to have "girlish" childhoods (all correlations with bullying were negative, although not statistically significant). On the other hand, those who showed one "girlish" childhood precursor also tended to have the other girlish precursors (correlations between .21 and .48, all significant) (Cardoso, personal communication). It is perhaps the presence of a non-intermediate type of "bisexual" among the working classes that explains the apparently greater frequency of homosexual behaviors found in his haphazard samples of typical working class males.

These cross-cultural studies suggest a few factors that might be behind the cultural variations in homosexual behaviors reported by anthropologists. To what extent, are cultural variations in line with the hierarchy/cooperation theory?

### **Cultural Variation**

The "hierarchy/cooperation" theory suggests that variations in the ways men cooperate or form hierarchies might explain much of the cultural variation in male homosexual systems. What is the evidence?

Elsewhere, Cardoso and Werner (2004) reviewed the results of statistical cross-cultural studies on homosexuality. Of particular interest were the results of Murray's (2000) and Crapo's (1995) comparisons of "gender-stratified," "age-stratified," and "egalitarian" systems of homosexuality. In a nutshell, these studies showed that "egalitarian" systems are most common where males are more involved with infant care, and where there is a generally more egalitarian social structure. "Gender-stratified" systems are most common where males and females do similar tasks, where women have more power, and where there is no adolescent segregation of the sexes. "Age-stratified" systems occur where there is more patrilocality and patrilineality and greater segregation of the sexes. This suggests that cultural variations in homosexuality may reflect different strategies for male/male cooperation. Where men must invest more in children they eschew homosexual relations, limiting homosexuality to adolescence, to rare "blood-brotherhood" ties or to "gays." Where they have more time to invest in cooperation they may engage in more homosexual behavior, perhaps to better cement relations. If the society is sexually segregated, this takes the "mentorship" form of homosexuality. Otherwise the "gender-stratified" system permits sexual escapades with pathics.

Historical changes in how hierarchies are constructed may also help account for the origin of the modern "gay" system in which typical males do not engage in homosexuality. Where hierarchies are based on personal connections, loyalties between males may be encouraged, but with greater professionalism, these ties may be disparaged as "nepotism" or "favoritism." Cardoso's (2004) study supports this view. Lower class males in all three of his societies were more likely than professional class males to agree that "getting ahead depends more on *whom* you know than on *what* you know." More importantly, within the lower classes of all three societies, the bisexuals agreed more with this statement than did the exclusive heterosexuals. These findings suggest that the increasing importance of professionalism as societies become more industrialized may be

behind the expansion of the "gay" system at the expense of traditional "gender-stratified" systems throughout the world.

The type of hierarchy in which men spend their lives may also affect the type of homosexual behavior men perform. For example, where men are more preoccupied about their position in a dominance hierarchy, the distinctions between what the submissives do and what the dominants do should be accented. Indeed, in his study of prison rape Silva (1998) showed that, despite their verbal "justification" of prison rape "to protect women and families" against convicted rapists, it was actually those prisoners most preoccupied about their personal status who advocated raping fellow prisoners.

As suggested by the pigtail macaque example cited above, concern about one's place in a dominance hierarchy may be most important where hierarchies are unstable or unclear. To examine this idea Mendes (1997) carried out a series of experiments in which she asked male university students to complete a short comic strip story about a prison. Mendes varied the stories slightly to ascertain the effects of these variations on student responses. Stories that included "intimate visits with women" significantly reduced the likelihood of ending stories with a homosexual rape scene. But even with these visits, 40% of the subjects still ended their stories with rape (other choices were physical fight, non-sexual friendship, and friendly sex). When Mendes contrasted prisons organized on the basis of personal loyalties, versus an abstract evaluation system, there was a slight (non-significant) tendency to cite rape more often in the "personal loyalties" situation (53.3% versus 33.3% of 60 students). The statistically most significant differences, however, occurred when Mendes combined the "personal loyalties" condition with either "stable" or "unstable hierarchies" (few or frequent changes of cellmates). Where hierarchies were more unstable, respondents were much more likely to end their stories with a rape scene (68.5% versus 26.7% of respondents).

These findings suggest it may be useful to include questions of hierarchy/cooperation in general studies of homosexuality. This may help explain a few apparently "anomalous" findings reported in the literature. For example, consider the finding of Adams, et al. (1996) that homophobic men are more sexually excited by homosexual pornography than are non-homophobes. The standard psychoanalytic interpretation is that homophobia results from repressed homosexual desires. But another possibility is that having an unstable status based on personal loyalties causes both greater homosexual excitement and more concern about what role one plays in these relationships — with the passive role being denigrated. This might explain Cardoso's (2004) findings that many bisexuals are not intermediate between gays and straights, but rather more "masculine" when it comes to liking to bully or dominate. Many other relationships between forms of male/male cooperation/hierarchy and homosexuality might be hypothesized. But I hope these examples are sufficient to show the value of an evolutionary perspective in suggesting what kinds of relationships to look for.

## **BIOLOGICAL ADAPTATION, PSYCHOLOGICAL ADJUSTMENT, AND MORALITY**

The ideas I have been discussing here have been around for many years, but they have been neglected, perhaps in part because many find them politically distasteful. I think this attitude results from misunderstandings about the relationships between biological adaptation, psychological adjustment and morality. In short, many people seem to have confused these really unrelated concepts. Gadpaille (1980:354), for example, argues that "homosexuality as a preferential or obligatory mode must by definition be biologically deviant," and implies that preferential homosexuality is pathological. Similarly, the psychoanalyst, Arango (1989), in proposing a close tie

between dominance hierarchies and homosexuality, argues that homosexuality is not "love" but "masochism."

But let us be clear here. Biological adaptation is not the same as "psychological adaptation" or "psychological adjustment." Biological adaptation refers to the passing on of genes. It is genes that are passed on, and that are adaptive or not. Individuals are never passed on — they always die. The heterosis argument has often been presented as the "sickle-cell" argument, in analogy with the well-known case of sickle-cell anemia. In malaria areas, individuals homozygous for the sickle-cell die of sickle-cell anemia, and individuals homozygous for the absence of sickle-cell are more likely to die of malaria — so mostly heterozygous individuals pass on genes. Now, in the case of sickle-cell anemia we really are talking about an illness! No one wants to get sickle-cell anemia, and people die from it. "Illness" and "health" are defined in terms of individual well-being, and perhaps at times (e.g. psychopathic killers) in terms of social well-being. People do not need to pass on genes to be considered healthy. They need to feel healthy and happy, and to not cause harm to others. Certainly homosexuality should be considered "healthy." Arango's argument that homosexuality is "masochism" is also off the mark, because it makes it sound as if our "real" selves are what we find in the innermost regions of the brain. But human nature is based on our whole brains. And of course all the different forms of human "love" (not just homosexual love) have their evolutionary history. I doubt very much whether Arango would reduce these forms of love to their homologues in ancestral fish!

Biological adaptation also tells us nothing about whether something is moral or not. Many adaptive traits are evil — for example the killing of another male's offspring when a new male overtakes a former dominant. Sommer (1990) has very nicely shown the absurdity of using the criteria of "natural" (adaptive) or "unnatural" (maladaptive) to decide whether homosexuality is "good" or "bad." He found historical examples of scholars who argued for all the different possibilities: 1) that homosexuality is natural (found in animals), therefore it is good, 2) that homosexuality is natural, therefore it is bad, 3) that homosexual is unnatural, therefore it is good, and 4) that homosexuality is unnatural therefore it is bad.

Still, there may be a tie between the notion of morality we actually have (not necessarily what we *ought to* have) and homosexuality. In short, surrendering one's own interests to the well-being of another is what we mean by morality. Humans are capable of such surrendering because in their evolutionary past they learned to yield at times rather than aggressively defend their own interests. If the hierarchy/cooperation argument is right, then the evolution of morality depended on the evolution of homosexuality. This may sound bizarre. If homosexuality is at the base of morality, why are exclusive male homosexuals so defiled in so many places? I think the answer is simply that they are easy to mistreat — they generally yield more easily than others.

This contradiction between what we define as moral, and how we treat those who most comply, may well be one of the major conflicts in human society. It deserves a name at least as catchy as the Oedipus complex, although it is not an individual psychological complex, but rather a social complex. If it is really as important as my argument suggests, then I imagined this complex must appear in human myths. There are several possibilities. For example, the Kayapó Indians have a story about a boy who shunned men's work, and was sexually abused by a bat man, which caused him to giggle— the very first laugh ever, unworthy of a warrior, but necessary for life (Werner 1984). Among the Cashinuaha there is a story about a great transvestite artist who showed the Indians how to draw, but who died because he was impregnated by a lover, and the baby could not be born (Lagrou 1996). But the best-fitting story is closer to home. The story of Jesus is about a man who "turned the other cheek" instead of fighting, who did not compete with other men for women, and who, in the end, was easily mistreated. Perhaps someday humans will learn to recognize this "Jesus Complex" and things will change, Then maybe Jesus' prophecy will be born out: "Blessed are the meek, for they shall inherit the earth."

## NOTES

<sup>1</sup>The differences between the North American/North European criteria and Brazilian lower-class criteria were most dramatically clarified for me in observing Brazilian reactions to American pornographic films. At one point in an American film a woman inserted her finger into her male partner's anus. The Brazilian audience went wild, crying out "*viado*" (queer) to refer to the male actor. On the other hand, in Brazilian *porno-chanchada* films of the 70's it was not uncommon for a man to have (active-role) sexual relationships with several women, and also with a *bicha* (effeminate homosexual). No one referred to the inserter male as *viado* in these film sequences.

<sup>2</sup>The use of more abstract "symbolic" expressions for dominance may be found in primates as well. Enomoto (1990) reports the case of one male bonobo expressing its dominance over another by using a gesture normally used to solicit sex from an estrous female.

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