

The Science of Sexual Behavior in Humans and Other Animals:

A Resource for the Churches



A report of the
ECUMENICAL WORKING GROUP ON FAITH & GENETICS
sponsored by the
EPISCOPAL DIOCESE OF MASSACHUSETTS

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Members of the Working Group
2004-2005

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CONTENTS

Introduction	5
Findings	7
Discussion and Implications	7
Summary	13
Bibliography	15

INTRODUCTION

THE FAITH AND GENETICS WORKING GROUP

Under the auspices of the Episcopal Diocese of Massachusetts, a study group is convened annually, called the Faith and Genetics Working Group, to study a topic of importance to contemporary life and faith. In 2004-2005, this group was comprised of ten scientists, engineers, clergy, and laypeople affiliated with several Christian denominations: Episcopal Church USA, Evangelical Lutheran Church in America, Mennonite Church, Presbyterian Church (USA), Roman Catholic Church, United Church of Christ, and United Methodist Church.

At the study's conclusion, the report was written by Barbara Smith-Moran and Norman Faramelli, with input from the rest of the Working Group. Carole Belgrade managed the bibliography, keeping it current and complete.

We express our gratitude to evolutionary psychologist Steven Pinker, Johnstone Family Professor of Psychology, Harvard University, for meeting with us to answer questions and to suggest additional materials for study. His range of knowledge and friendly encouragement were very much appreciated.

MISSION

The churches in contemporary America continue to struggle with attitudes and mores concerning sexual behavior, particularly in humans and most especially in homosexual humans. We members of the Working Group feel that much of the difficulty results from resistance to augmenting traditional religious understandings of animal and human nature with modern scientific insights. These traditional understandings are based in wisdom influenced by ancient, medieval, and enlightenment scientific worldviews, and they do not adequately serve Christians who live their lives and make decisions within a contemporary scientific worldview.

We hoped to find some scientific clarity that might illuminate our understanding and perhaps ease the churches' struggle. We have read extensively, though not exhaustively, in contempo-

rary scientific studies of sexual behavior (see bibliography at the end of the report), including biological, biochemical, sociological and psychological studies. Our objective was to evaluate these studies and arrive at a consensus on conclusions that could be drawn with integrity. This report suggests how this knowledge might augment, moderate, and inform the religious tradition.

We adopted the following mission statement:

Over a nine-month period, to study the natural science of sexual behavior in humankind and other species (for example, the biology of attraction and relationship formation), and to make recommendations about which scientific studies are best taken into account as the churches formulate their positions and policies touching upon human sexuality.

OBJECTIVITY

We realize that complete objectivity is impossible in any study of a topic as emotionally intense as sexual behavior, especially in our own species, in relation to other mammalian species, including other primates. We have, nonetheless, attempted to be as objective as possible in order to avoid the politicization that characterizes much of the popular print and internet literature about sexual behavior. Our findings do not say whether a particular behavior (e.g., multiple partners) is wrong or right. We hope that consideration of sexual patterns and practices of other species might provide fresh perspective and broaden the context for the churches' conversations about what is acceptable or healthy or sacred about human sexual behavior.

We learned to expect and deal with what are colloquially known as “sexual attitude readjustments” (SARs), those moments of discomfort caused by information that challenges deeply held beliefs about sex. Not everyone experienced SARs in the same situations, so we were able to help each other through to “the other side” of SARs and keep the discussions going.

FINDINGS

1. In higher animals, sex has many different functions.
2. Homosexual behavior is widespread throughout the animal kingdom.
3. Homosexual orientation is found in the human community with frequency in the range of 2% to 10% of the general population.
4. Research with nonhuman mammals shows that sexual behavior is guided in large part by the action of pheromones.
5. Initial findings from research on humans indicate that pair-formation is influenced by the action of pheromones.
6. Personal preference in humans' choice of sexual partners is complex.
7. The reactions of individuals and society to homosexuals and homosexual behavior, and the reasons for those reactions, are also complex and deserve scientific study.

DISCUSSION AND IMPLICATIONS

1. In higher animals, sex has many different functions.

Sexual activity has a procreative function in all animals, though the exceptional species is able to procreate without it. Among most mammals, it serves a variety of functions; and among social species, it is used in a variety of social settings. Sexual activity between individuals takes numerous forms and does not necessarily include intercourse. Among other things, sex provides tension relief and diversion—what humans might call fun or play (biologist Bruce Bagemihl uses the term “exuberance”). Sex is routinely used by individuals of some species to obtain food, status, and favors from others, and to establish and maintain group dominance. For bonobos (a species of African primate closely re-

lated to chimps and humans), sex is part of reconciliation rituals after squabbles within the group. None of these behaviors is exclusively heterosexual or homosexual.

It is safe to say that only humans are cognitively aware of the connection between heterosexual intercourse and procreation. The idea that sex is to be used exclusively for procreation is a human construct, one that is not suggested by or reflected in the behavior by any species, including humans.

Theological implications:

In the Western theological tradition, there has been a misguided emphasis on sex. The current struggles of many churches to understand homosexual behavior, its causes and purposes, are indicative of a misunderstanding of the purposes and patterns of sexual behavior in general—a misunderstanding based upon pre-scientific teaching. In the neo-Platonist and Augustinian framework, for example, the physical body is considered to be separate from and inferior to the soul or spirit. In Western Christianity, there is also a tradition rooted Aristotle, and expressed more fully in St. Thomas Aquinas, that places more emphasis on the physical world than Platonism/Neo-Platonism does. Unfortunately, with regard to sex, it is the Neo-Platonic/Augustinian tradition that has prevailed. From a Christian perspective, it is clear that both body and soul/spirit are essential parts of the created order.

Sex is an important part of that created order. To reduce sex solely to a procreative role is to demote the significance of the body. It is, therefore, desirable that we humans accept and celebrate our bodies as gifts from God. Although the current struggles of the churches to understand homosexuality may be related to a confusion regarding sexuality itself, there has also been a tradition in the churches that views homosexuality as an “objectively disordered” condition. That tradition has to be taken seriously.

2. Homosexual behavior is widespread throughout the animal kingdom.

As a part of this study of sexual behavior, we spent a great deal of time looking at homosexual behavior in humans and other animals, including its biological basis. We of the Working Group

are sensitive to how easily the findings in this area can be politicized, and we do not intend to use the findings here to push a particular agenda.

Across hundreds of bird and mammal species studied, including humans and the great apes (the species genetically closest to humans), between 2% and 20% of individuals engage in homosexual activity. This does not usually preclude heterosexual activity. Disproving earlier assumptions, research shows that homosexual activity (among nonhumans) actually occurs more frequently in the wild than in captive situations (zoo, aquarium, laboratory).

3. Homosexual orientation is found in the human community with frequency in the range of 2% to 10% of the general population.

There are differences between human male and female homosexual patterns. Studies show that there are many factors at play: genetic, environmental (including chemical)—and, at least in humans, psychological. Homosexual behavior is observed across the animal kingdom (higher animals, that is), including humans. A number of scientific studies show strong evidence that sexual orientation in humans is partially determined by genes. However, attempts to identify a gene or gene complex associated with human sexual orientation have been inconclusive.

The much-used term, “gay gene,” is a misnomer taken from the subtitle of geneticist Dean Hamer’s book, *The Science of Desire: The Search for the Gay Gene and the Biology of Behavior* (1994). Hamer presents two findings, only one of which has been confirmed through further research. The confirmed finding is this: homosexual men have a disproportionately high number of gay relatives on their mother’s side, as compared to the heterosexual population. This pattern of heredity is a reliable indicator of a sex-linked trait as the genetic factor in homosexual orientation.

The development of any trait is always dependent upon the action of a combination of genes or systems of genes, with a “network” of action at different times throughout life. Some people with the genetic make-up for a certain trait will never develop that trait, while others will. The study of identical twins shows that the

same genes express themselves in different ways in different individuals—who live different lives with different internal and external environments.

There is as yet no scientific clarity as to the evolutionary benefit conferred to a species by exclusively homosexual behavior.

Theological implications:

(a) Since homosexual expression exists throughout the animal kingdom, it is difficult to say that it is not part of the natural order. Therefore, we of the Working Group find the Natural Law argument against homosexuality to be unconvincing.

(b) The claim is often made that human homosexuality is a result of the Fall of humanity into sin. The same cannot be said for other animals, because nonhuman animals are not responsible agents and do not participate in any fallen condition. The claim about humans needs some modification in light of this. Nevertheless, some would argue that since all of creation is affected by the Fall of humanity, homosexuality in the animal kingdom is one result. We, however, do not find this view compelling.

(c) The behavior of nonhuman animals cannot be used to justify moral permission for similar human behavior, even though genetics and observational biology show that humans are much closer to animals than previously thought, especially to chimpanzees, bonobos, and gorillas. Observational biology shows that humans do many things that other animals do not do, e.g., give prolonged care to the aged and infirm.

4. Research with nonhuman mammals shows that sexual behavior is guided in large part by the action of pheromones.

Pheromones are a class of chemical vapors similar to odors. Both pheromones and odors are detected by special cells on the membranes inside the nose. Pheromones are emitted from the body of one individual, and they cause physical changes and/or behaviors in other individuals of the same species. Female mammals in “heat,” for instance, signal their reproductive readiness with pheromones. Under the influence of these pheromones, males typically

become attentive, “amorous” and sometimes possessive; and they emit their own pheromones that typically induce the female to be receptive to intercourse.

The senses of taste, smell, and pheromone reception are closely related to each other. Biologists Linda Buck and Richard Axel, working with rodents, discovered the specialized cells on the tongue (taste reception) and nasal membrane (smell and pheromone reception) that are responsible for how these senses work. They also discovered the genes associated with the development of these cells, as well as the way in which these cells stimulate the brain. They won the 2004 Nobel Prize in Physiology or Medicine for their work in this area.

5. Initial findings from research on humans indicate that pair formation is influenced by the action of pheromones.

Research with human subjects is beginning to show some intriguing results. It is not yet clear where the receptor cells for pheromones are located (perhaps on the nasal membranes, as in other mammals). Nor have scientists yet definitively identified any human pheromones. In several studies, hormonal, behavioral, and brain-function changes in men and women have been attributed to the action of putative pheromones. These include the synchronization of menstrual cycles of women dorm-mates; the choice (by heterosexual women) of some men over others based upon clothing “odor”; and, most recently, the stimulation of certain brain activity in heterosexual women and homosexual men, caused by a putative male pheromone.

It appears likely that pheromones may be part of a cascade of chemical reactions in the brain and body that result in the condition of infatuation, and in the desire to “cuddle” and to seek sexual intimacy with a partner. Many hormones (such as oxytocin) and the chemicals of the brain and nervous system (such as serotonin) are involved in the mood changes associated with pair formation—falling in love and courtship.

Theological implications:

This research bears watching as new results are published. Its importance lies in the influence that pheromones appear to have

upon mate choice, and the implications for the understanding of free will. Because pheromones are not consciously detected or sensed in any way, they cannot be thought about; their influence is subliminal. For example, if a man's brain and body react to the influence of pheromones he is unaware of, how can he be said to be responsible for arousal or other changes caused directly by the pheromonal action upon him? Whether or not a person's brain and body react to a particular sex pheromone is most likely determined by that person's genetic make-up. Personal responsibility pertains, of course, to voluntary actions, regardless of the stimulus.

6. Personal preference in humans' choice of sexual partners is complex.

Many factors are involved in the choice of sexual partners in humans. The action of pheromones seems to be to provide subliminal "encouragement" in social situations to develop relationships with certain individuals but not with others. Appearance and presentation (visual markers) are very important both in bird species and in humans. The influence of touch is also important for humans and many other animals. The category of "psychological factors" (memories, personality, etc.) is a large one, as is the category of "social factors" (peer opinion, social norms, etc.). These two categories seem to operate exclusively within the human species.

Theological implications:

The more we humans learn about the science of sexual choice, the more we are led to rejoice in the wonderful complexity of our minds and bodies: "I will thank [God] because I am marvelously made" (Psalm 139:13).

7. The reactions of individuals and society to homosexuals and homosexual behavior, and the reasons for those reactions, are also complex and deserve scientific study.

At present, biological studies do not give a clear or full understanding of why some people form same-sex bonds of a sexual nature, while others do not. We wonder whether clarity from science would make any difference to people with negative reactions.

We suspect that if the factors involved were clarified by science, some people would wish to use this information to develop and use discriminatory technologies and practices.

In the military, one reaction to the announcement of the discovery of a possible genetic basis for homosexuality was to propose treating homosexual men and women as separate genders in addition to the other two genders (heterosexual men and women) and to discuss building separate dorms for them on base. Such treatment may be seen as discriminatory, a sort of ghetto-ization. Others might see the possible genetic basis as a reason to seek fetal genetic testing during pregnancy, with a view toward genetic modification of undesirable DNA—another discriminatory practice.

In one of the sources we used (Stein's *The Mismeasure of Desire*), the author concludes that, although biological studies give no clear understanding why a person becomes a homosexual, biological studies are largely irrelevant since the data are limited. He says that the more pressing question is this: What is it about homosexuality that makes it socially unacceptable to some?

The cultural reaction to homosexuality is a greater problem—and of more importance—than the biological basis for homosexuality. Our Working Group adds these related questions: What is it in American culture, including the churches, that causes some people to have strong negative reactions to homosexual behavior? Why is this reaction not shared by everyone? What, if anything, influences a change in attitude? What triggers the impulse to constrict or to enlarge one's "circle of empathy and love"? We did not find any studies addressing these questions. This is fertile ground for sociological and psychological research in the future.

SUMMARY

In higher animals, sex has many different functions, including play or fun. There is a lot of sexual activity that does not lead to intercourse. In all species except humans, procreation is an unwitting "side-effect" of heterosexual intercourse—which is to say, only humans are conscious of the causative connection. Homosexual behavior is widespread throughout the animal kingdom and does

not usually preclude heterosexual behavior. Same-sex orientation is found in the human community with frequency in the range of 2% to 10% of the general population.

Sexual behavior in animals is conditioned by biological and physical factors, as well as by environmental and other factors. Among nonhuman mammals, sexual behavior is guided in large part by the action of pheromones. Initial results from research on humans indicate that pair-formation can be influenced by the action of pheromones. Personal preference in humans' choice of sexual partners is complex, involving not only pheromones, but also psychological factors and social factors. Research findings on the identification and action of human pheromones on sexual partner selection are likely to bring revisions in the current understanding of free will, preference, and responsibility for choices.

The reactions—especially the negative ones—among individuals, churches, and society to homosexuals and homosexual behavior, and the reasons for those reactions, are complex. They certainly deserve scientific study.

While the sexual behavior of fruit flies and rodents might not be considered particularly relevant to that of humans, the behavior of primates seems to be more so. The sexual practices of primates cannot give moral justification for similar practices among us humans. However, they do encourage us to recognize commonalities in the purpose and exercise of sexuality, and to rethink certain assumptions and religious teachings about sex and the physical body.

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