Commentary: Human sexual orientation has deep biological roots

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By Dean Hamer and Michael Rosbash | Los Angeles Times

There was an elephant in the San Francisco courtroom where lawyers contested the constitutionality of Proposition 8, the California law that prohibits the marriage of same-sex couples. One key issue should influence every aspect of the Perry v. Schwarzenegger proceedings yet remained unspoken: What makes people gay? Is it a choice or is it innate?

Most geneticists consider sexual orientation a phenotype — namely, an observable set of properties that varies among individuals. Although physical phenotypes like height and weight are easier to quantify, behavioral phenotypes are intensely studied in animals and humans. Research from many directions leads to a strong conclusion: Human sexual orientation has deep biological roots.

Moreover, the empirical evidence for the role of genetics in human sexual orientation has been quietly but steadily mounting over the last 15 years. Studies of twins — the mainstay of quantitative human genetics — have been conducted on large populations in three countries. The results unambiguously demonstrate that heritability plays a major role in sexual orientation and far outweighs shared environmental factors such as education or parenting.

During the early 1990s, there was an unfortunate flurry of less-than-convincing findings on specific genes and sometimes over-hyped media announcements. Indeed, critics of sexual orientation inheritance are fond of pointing out that there is no single identified "gay gene." However, they fail to mention that the same is true for height, skin color, handedness, frequency of heart disease and many other traits that have a large inherited component but no dominant gene. In other words, sexual orientation is complex, i.e., many genes contribute to the phenotype.

Gay genes appear paradoxical at first blush. From the perspective of natural selection, how could they persist in the population if they lead to fewer offspring? Recent research has uncovered several plausible explanations. For example, one set of studies found that the same inherited factors that favor male homosexuality actually increase the fecundity of female maternal relatives. By balancing the number of offspring, they would contribute to maintaining these genes over the course of evolution. This explanation may not be exclusive but serves to illustrate that the Darwinian problem is not necessarily overwhelming.

There have been other surprises. One is the importance of epigenetics — changes that alter gene expression without a change in the DNA code of an affected gene. This is evidenced by the lopsided number of maternal versus paternal factors in male sexual orientation and by unusual patterns of DNA modification in mothers of gay men. Epigenetic changes may also explain the finding that a male's probability of being gay is increased by his number of older brothers.

Although these factors are neither genetic in the traditional Mendelian sense nor fully understood, they are still biological and affect phenotype in an involuntary manner. Who chooses his number of older brothers?

All of these findings demand the conclusion that most gay people no more choose their sexual orientation than most heterosexuals. ("Most" is used here to indicate that — like almost everything biological — these are statistical data and do not apply uniformly.) This conclusion is also consonant with our memories: Most of us were stunned as unsuspecting adolescents to discover our sexual orientation — heterosexuals and homosexuals alike.

Biology cannot be avoided in determining whether fundamental rights are protected under the equal protection clause of our Constitution. This is because "immutability" is one of the factors that determine the level of scrutiny applied to possible violations and that determine whether gays are awarded "suspect class" status, which would give them more constitutional protection. Heritability is not necessary for immutability or suspect class status (religion is the usual counter-example), but it should be sufficient; we do not choose our genes, nor can we change them.

The court of public opinion may be the ultimate arbiter, and here there is cause for optimism about what education can achieve. Recent studies in college classrooms show that exposure of students to information on the causes of homosexuality has a direct influence on opinions about gay rights. This fits with polling data showing that people who believe that gays are "born that way" are generally supportive of full equality, whereas those who believe it is "a choice" are opposed.

The importance of education is also underscored by the extent to which a lack of education is problematic. One national survey found that 70% of those who think being gay is a choice favored the re- institution of sodomy laws. This would turn some 15 million Americans into common criminals for simply being who they are. Science education must help people understand that phenotypic variation, including sexual orientation diversity, is an immutable feature of human biology.

ABOUT THE WRITERS

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