The Neurobiology of Sex/Gender-Based Attraction

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What causes same-sex attraction? Or, more broadly, what controls sex/gender-based attraction? Over the years there have been numerous theories, but more recently scientists have focused on the biology and, more specifically, the neurobiology of gender-based attraction. This article takes the reader through a critical review of the current literature related to sex/gender-based attraction. In examining this literature it is important to ask who is doing the studies, who has an interest in the results, and how the assumptions of the investigator and the audience affect the study design and conclusions.

KEYWORDS gay, lesbian, bisexual, attraction, biology, neurobiology, sexual orientation

INTRODUCTION

Is it our genes? An overbearing mother? All-boys schools? Shane from “The L Word”? What makes people gay? This article presents a brief review of the current literature on the neurobiology of sex/gender-based attraction, provides tools to assist in the objective evaluation of research involving sexual orientation, and introduces some of the sociological issues surrounding controversies over a biological basis for homosexuality.

There are several important issues to keep in mind when evaluating any study involving social behavior. First, we must consider who is interested in the results and how the identity of those spearheading a study may affect the study design. We have only to reflect on the Tuskegee Syphilis Experiment to realize how much this first issue matters. A second question we must

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ask ourselves is what assumptions we are making in composing research questions and in creating studies to address our questions. Our assumptions serve to guide the study design, and the study design has great impact on the form our results take.

WHO IS DOING THE RESEARCH?

In order to assess studies on sexual orientation, we must examine who is conducting these studies and who is interested in the results. It appears that mostly gay and bisexual people themselves are concerned with learning why people are gay. Though straight people certainly have sexual orientations, they do not seem to be taking the lead in studies of the neurobiology of sex/gender-based attractions.

Many gay people are simply curious about why they happen to fall in the minority when it comes to sexual orientation. Others are excited by the idea that a study could “prove” that their sexual orientation is not a choice. Many people feel that if they can demonstrate that their sexual orientation is not a choice, then people will stop trying to “fix” or “cure” them. In addition to gay and bisexual people, there are also straight researchers and laypeople who are interested in learning more about the biology of sexual orientation. Many straight allies want to be able to tell their friends and families that they believe being gay is perfectly normal. One of the easiest ways to argue for gay rights is to use scientific evidence to show that gays do not choose their attraction to the same sex. The backing of science makes straight allies much more comfortable in their claims, for the same reasons that gays are comfortable citing scientific studies that demonstrate their desires may be linked to biology.

There is one unfortunate implication of the argument that homosexuality is not a choice. Those gay people who argue that homosexuality is not a choice are also implying that if it were a choice, they would not have chosen it. In their efforts to prove to the larger society that people are born gay, some researchers may be demonstrating internalized homophobia. John D’Emilio was concerned with this approach when he wrote:

“... our response must be to challenge the underlying belief that homosexual relations are bad, a poor second choice. We must not slip into the opportunistic defense that society need not worry about tolerating us, since only homosexuals become homosexuals. At best, a minority group analysis and a civil rights strategy pertain to those of us who already are gay. It leaves today’s youth—tomorrow’s lesbians and gay men—to internalize heterosexist models that it can take a lifetime to expunge.”
(D’Emilio, 1993)
It is not helpful to wait for science to prove “innocence” as long as we continue to live in a society that values certain choices over others. If we play this game, we will inevitably always be behind the scientific curve, hoping to be shown free of “blame” for our particular choices.

Many queer and well-meaning straight people are behind studies of sexual orientation. Other groups are not so well intentioned. For example, some straight and gay people feel threatened by the idea of bisexuality and have targeted surveys and research to disprove its existence as a distinct sexual orientation. One group (Rieger, Chivers, & Bailey, 2005) measured the arousal of straight, gay, and bisexual men in response to male and female sexual stimuli. The New York Times reported on this study in advance of its publication in an article provocatively titled “Straight, Gay or Lying? Bisexuality Revisited” (Carey, 2005). The hypothesis behind the study was that bisexual men do not exist, and that those who claim to be bisexual are straight and pretending to be more “open,” than they are or gay and in denial. The New York Times reporter argues that the paper “lends support to those who have long been skeptical that bisexuality is a distinct and stable sexual orientation” (Carey, 2005).

The researchers involved in this study included the controversial J. Michael Bailey, who wrote the book The Man Who Would Be Queen (Bailey, 2003), which claims that many transgender people are “autogynophiliacs.” The study exposed a group of self-identified homosexual, bisexual, and heterosexual men to pornography involving either men or women. Investigators then measured subjects’ genital arousal (by penile circumference) to each of the stimuli. The study unabashedly expresses a wish to demonstrate that bisexual men do not exist. Its introduction begins with this statement: “Although bisexual behavior is not uncommon in men, there has long been skepticism that it is motivated by strong sexual arousal and attraction to both sexes” (p. 579). The authors go on later to state that “when self-report is suspect, genital arousal may provide a more valid measure” (p. 580), and then relate that up to 40% of homosexual men have identified as bisexual at some point during their coming-out process, implying that the category “bisexual” might actually be just a step on the way to homosexuality.

The results of the study indicate that the genital arousal of bisexual men looks similar to that of heterosexual and homosexual men. Most of the self-identified bisexuals were aroused disproportionately by either the men or women, instead of equally by both, leading the author of The New York Times article that reported the findings to conclude that the bisexual men were either “Straight, Gay or Lying.” What the Times article failed to mention, and the original research study did not emphasize, was that most of the men, including those who identified as heterosexual and homosexual, were at least somewhat aroused by their nonpreferred sex, even if that arousal was not as great as their arousal to their preferred sex. The original article remarks cursorily that “this suggests that most men may possess a certain capacity
for bisexual arousal.” The results indicate that bisexual men have similar patterns of arousal to heterosexual and homosexual men. However, in their conclusion, rather than deducing that most men are bisexual, the authors decide that “it remains to be shown that male bisexuality exists.”

This study was open in its disdain for bisexuality, yet most studies that discount bisexuality do not do it so obviously or perhaps even wittingly. Many neurobiological studies discount bisexuality in more subtle ways, either by excluding the results of those people who identify as bisexual or rolling them into a category called “nonheterosexual.” For example, in studies comparing the concordance of sexual orientation between monozygotic twins and other sibling pairs, twins are sometimes considered in concordance when one is homosexual and one is bisexual because they are both nonheterosexual. If we take a step back we can see that this makes no more sense than grouping those who are straight and bisexual together because they are both “nonhomosexual.” By grouping gay and bisexual subjects together we are assuming that heterosexuality is the standard, and that all other forms of sexuality are “other,” or even perhaps deviant.

ASSUMPTIONS

When interpreting a study, especially one involving social behavior, it is important to think about the assumptions inherent in the study design, that is, what beliefs we had even before the study began. To illustrate the power of our assumptions to dictate the outcome of a study, take, for example, the groups we use to classify sexuality. Many of our studies of sexuality classify participants into two groups, heterosexual or nonheterosexual. In our society, where heterosexuality is the norm, it may not seem strange to us that nonheterosexual people are classified together in one group because nonheterosexual people deviate from the norm. The bisexual person is just one step away from the homosexual, the argument goes. Thinking outside of our own assumptions, if we lived in a world where homosexuality was the norm, our researchers might outline the two main sexual orientations as homosexual and nonhomosexual. If bisexuality were predominant, we might group people as bisexual or monosexual, and search for a gene that makes people unable to love both men and women. “What,” we would ask ourselves, “is wrong with monosexual people? What faulty genetic wiring makes them unable to have attractions to both sexes?” We must acknowledge our assumptions before we can critically analyze studies of sexual behavior.

In this article, I outline eight common assumptions that we make in research on the biology of sexual orientation. One key assumption is that our categories of sexuality are self evident. This article is titled “The Neurobiology of Sex/Gender-Based Attraction,” rather than “The Neurobiology of Attraction,” because there are many bases for attraction. It happens that
in our culture we have identified the sex or gender of one’s preferred partners as the most important basis for attraction. In another culture or another time, where, for instance, people were all assumed bisexual, they might use “sexual orientation” to describe the height, intelligence, hair color, skin color, or smell of the person to whom people were attracted. It is important to remember that our categories are not self-evident but are simply social constructions. When we build our studies around the assumption that our categories of sexuality are self-evident, we inevitably demonstrate the existence of these categories.

Another common assumption is that gender and sex are the same thing. In writing about sexual orientation, I use the term “sex/gender” based attraction. This is intentional, as I do not feel I truly understand which of the two—sex or gender—we are talking about. When someone says that he or she is attracted to men, does this mean the male sex or the male gender? What attracts a person to men? Is it their bodies or their places in society—the norms into which they fit because of the way they are raised? The answer is sometimes both and sometimes only one. This distinction is especially important for transgender and intersex people and is crucial to our understanding of attraction in general.

A third assumption is that sex and gender are dichotomous traits. Although we often take this assumption for granted, intersex people cannot. A recent study by Anne Fausto-Sterling showed that 1.7% of the population is intersex (Blackless et al., 2000). Almost two out of every hundred people are born neither male nor female (or both, depending on one’s viewpoint). Yet we construct a world with male and female bathrooms, clothing, toys, and activities, as if everyone is either one or the other. What does this have to do with sexuality? Consider what your sexual orientation would be if you were attracted to an intersex person. Would it be based on gender presentation or genitals? What if you are attracted to a transgender person? Sexual orientation becomes much more complicated when our assumptions about sex are challenged.

A fourth assumption, already discussed, is that heterosexuality is the normal developmental path. Though gay rights activists have been successful in changing the cultural belief that homosexuality is a moral or psychological illness, they have replaced this theory with one that relies on a genetic or biological cause. Despite taking the blame off of the individual, biological theories continue to imply that homosexuality is a deviation from the normal path, which is presumed to be heterosexuality. Almost all biological studies of sexual orientation search for ways in which something has gone “wrong” or at the least differently than “usual.” Certainly heterosexuality is our cultural norm, but we do not know if it is a biological norm or if there are many ways for people to develop that are all normal alternatives. Though only a small portion of the world’s population has blue eyes, we do not consider blue-eyed people a deviation from the normal pathway but rather
just another normal variation. At this point we know so little about attraction in general that to make any presumptions about what is normal or abnormal is suspicious at best. Ask any scientist what makes straight people straight, and she or he will have no answer for you.

Another common research assumption is that deviations from the expected or “normal” sexual path are linked to deviations from the “normal” gender path. Although our culture has begun to accept that many gays and lesbians are quite typical in their gender expression, it is difficult to escape the stereotype that gay men are more feminine than other men and that lesbians are more masculine than other women. Because of the cultural assumption that heterosexuality is the norm, we find it rather easy to view gays as typical of the other sex. If a man is gay, we assume that in order to be attracted to other men there must be something feminine about him. This is heterosexist thought, and it leaks into our research. Many studies that purport to be related to sexual orientation are set up to demonstrate that gay men are more similar to heterosexual women than they are to other men who happen to be straight. These studies often investigate traits unrelated to sexuality, such as throwing a ball or reading a map. We continue to perpetuate the myth that sexual orientation is intimately linked to gender identity, even though we know that homosexuality is not the same entity as transgenderism.

While there may be links between gender expression and sexual orientation, it is certainly not as simple as gay men being equivalent to straight women. In a society where being masculine is valued over being feminine, and we are taught to believe that masculinity should be limited to men and femininity to women, we are challenged by the idea that men might have traits we consider feminine, such as being attracted to other men. Because sexuality and gender are linked in our minds, what we call homophobia may actually be sexism. Instead of searching for ways in which homosexual men are similar to heterosexual women, we could break through some of our assumptions by studying what traits all people who are attracted to men have in common.

Another common assumption we often make is that biological is the same as genetic. We frequently use these terms almost interchangeably, yet they are not the same concepts. Genetic implies that something written into the genome contributes to a particular trait, while biological is an umbrella term that covers any process that takes place in the body. The biology of the body can be influenced by its genetics but also by the environment of the womb and the world into which someone is born. Our neurobiology changes as we learn and grow and is heavily influenced by our cultural experiences.

Another convenient assumption we make is that studies of male sexuality can be generalized to apply to anyone. The majority of studies related to the biology of sexual orientation are done in male subjects. These may in
fact not be generalizable to women, transgender, or intersex people, though they are often assumed to apply to all people.

A final assumption we often make is that women’s sexuality is more fluid than men’s. One of the reasons that many of our studies of sexual orientation are performed on gay men may be related to our cultural assumption that women’s sexuality is more fluid than men’s. We believe as a society that women’s sexuality is more susceptible to environmental influences and that men are more hard-wired in their sexual desires. We live in a climate where women are allowed more freedom of sexual and gender expression and even encouraged by the dominant group (men) to engage in sexual acts with other women for a male benefit, while men are policed with airport security-like rigor. It may be that women are more liberal about their sexual behaviors. However, this tells us nothing about our underlying biological predispositions; it is simply a cultural observation. It is likely that most bisexual men in our society function as heterosexual and keep their bisexual feelings secret from others.

While I have listed eight common assumptions, there are many more that we make, and I encourage anyone studying such complicated biological and cultural practices as sexual orientation to consider his or her own assumptions and biases before making any speedy conclusions.

RESEARCH STUDIES

Scientists have considered the neurobiology of sexual orientation from many different angles, including genetics, physiology, neuropsychological studies, histology, and neuroimaging. In the most recent large genetics study, Kendler et al. (2001) analyzed a national sample of twin and nontwin male sibling pairs. The results showed that monozygotic twins were more likely to resemble each other in sexual orientation than dizygotic twins or nontwin siblings. This evidence suggests that same-sex attraction in men may be influenced by genetics. However, there are a number of discussion issues that emerge from this study. As with many twin studies, the twin pairs reviewed were not all separated at birth. Monozygotic twins are more likely to be raised in similar social environments than nonidentical twins or nontwin sibling pairs, and so their similar features may be the result of environmental influence and not genetic similarity.

This study also had other flaws. It tells us nothing about the influence of genetics on women’s sexual orientation because it does not ask. In addition, sexual orientation was assessed by a single item on a questionnaire: “How would you describe your sexual orientation?—heterosexual, bisexual, homosexual.” Not until they had combined the bisexual and homosexual categories could the researchers present findings that reached a sufficient statistical power for the study. In their search for statistical significance, the researchers subsumed bisexuality within homosexuality.
The national twin study was not the first survey to examine the influence of genes on sexual orientation. In the early 1990s, scientists studying the families of gay men noticed that gay men seemed to have more close gay male relatives on their mothers' than on their fathers' side. This led Dean Hamer of the National institutes of Health to believe that there may be a locus on the X chromosome related to male homosexuality (Hamer et al., 1993). He interviewed gay men and separated out those whose families, by report, seemed to match this criterion. He then performed a linkage analysis on gay male siblings who fit into this maternal transmission group and found that they shared 82% of their alleles in the Xq28 region, greater than the 50% expected by chance. The p value was 0.00001.

Hamer's conclusion was that a locus at the q28 region of the X chromosome was involved in homosexual orientation in some but not all gay men. Follow-up studies have been performed to test the replication of Dr. Hamer's work. Two of the three follow-up studies by Sanders and Hu found similar results (Hamer, 1999; Hu et al., 1995), although the percentage of alleles shared was in the 60% range rather than the 80% range. One follow-up study (Rice et al., 1999) failed to replicate Hamer's findings, but this study did not separate out gay men whose familial lines seemed to be maternal, and so it may be that only a subset of gay men has this allele that may contribute to male homosexuality. No study like this has been attempted with lesbians.

With the introduction of the first studies of a possible “gay” gene, there was a lot of talk about the evolutionary viability of a gene that would promote homosexuality. While these explanations remain theories, it is important to understand the four most commonly discussed mechanisms for the maintenance of a gay gene in the population (Muscarella et al., 2001). The first is overdominance, a theory in which “gay” genes provide some sort of superior fitness when heterozygous. For example, one copy of the gene might increase the likelihood of attraction to the same sex, while two copies might add bigger muscles to fight predators. Kin altruism has been proposed as another mechanism for maintenance of a “gay” gene in the population. The theory is that while gays may not spend their time reproducing, they might instead focus their energy on taking care of their relatives’ children, thereby increasing the reproductive success of their family overall. A third theory, sexually antagonistic selection, suggests that alleles that may decrease the reproductive fitness of one sex are maintained in the population because they increase the fitness of the other sex. For example, the same gene or genes that make a man gay might make his sister irresistible to men. Finally, a more recent evolutionary theory for the existence of homosexuality posits that genes linked to homosexual behavior may have contributed to male survival by reinforcing homosocial bonds and therefore increasing resource sharing and social support among males.

In addition to genetic studies, researchers have also investigated physiological theories for sex/gender-based attraction. Most physiological studies
have centered on endocrinological explanations for same-sex attraction. In the early 20th century, when endocrinologists first conducted research on gay men, they were looking to find differences in the adult hormone levels of gay and straight men. No differences in testosterone levels or any other hormones in adult males have been found. However, an interesting phenomenon was noted, which led to further research into the endocrinology of sexual orientation. A fraternal birth order effect was demonstrated for gay men, where the more older brothers a man has, the more likely he is to be gay. The proposed mechanism for the fraternal birth order effect is progressive immunization of some mothers to male-linked androgens. The theory is that after a number of pregnancies with male fetuses, the maternal immune system can come to see male specific antigens as “nonself” and produce antibodies against them, resulting in a changed hormonal milieu for the next male fetus. Estimated odds of being homosexual increase by 33% with each older brother, and epidemiological studies suggest that approximately one in seven homosexual men may owe their sexual orientation to the fraternal birth order effect (Blanchard, 2001). This is an interesting theory, but one that does not explain all cases of male homosexuality and says nothing about female sexuality.

One condition that does affect women and may provide some insight into the neurobiology of female sexual orientation is Congenital Adrenal Hyperplasia (CAH). This intersex condition gives further evidence for the hypothesis that prenatal hormone levels affect adult sexuality. In CAH, there is a deficit in the production of an enzyme in the steroidogenesis pathway. The most common deficit is 21-hydroxylase, which aids in the eventual conversion of cholesterol to aldosterone and cortisol. When this enzyme is deficient, excess substrate is channeled to form androgens, and the fetus is exposed to an increased amount of prenatal androgens. If the fetus has XX chromosomes, the genitalia can be masculinized. Studies of women who were born with CAH show that they are more likely than other women to be lesbians as adults, but the evidence is not overwhelming (Meyer-Bahlburg et al., 2008). This suggests that uterine hormones may affect adult female sexuality but also that the critical periods for masculinization of the genitals may be different than those that affect behavior and sexuality.

What we learn from the fraternal birth order effect and from women with CAH implies that intrauterine hormone levels have effects on adult sexuality. However, we cannot at this time safely measure intrauterine hormone levels in order to strengthen our correlational evidence. Recently, studies have been done on “proxy markers” for prenatal hormone exposure, that is, morphological features that mark on the body the levels of hormone exposure in utero. These have been found to correlate with sexual orientation. One of these proxy measures is finger length, known as the 2D to 4D ratio. Studies have shown that lesbians have longer ring fingers compared to index fingers than straight women do, making their finger morphology more
similar to straight men than other women (Williams et al., 2000). The results are very mixed for men, with some studies showing that gay men have more masculinized fingers than straight men and others showing that their fingers are less masculinized. Another study found that gay men are more likely to have a counterclockwise hair whorl than are straight men (Klar, 2004).

All of these studies examine markers of intrauterine hormone exposure, rather than measuring true levels, but they do suggest that there is a connection between the hormonal milieu and later sexual attraction. Clearly, for intrauterine hormone exposure to affect sexual orientation and, for the most part, not body morphology, there must be separate critical periods for development of genital organs and the brain. To make matters even more complicated, researchers have been examining the role of prenatal hormone exposure in gender identity. If both sexual orientation and gender identity are affected by prenatal hormone levels, the development of these characteristics also must be separated in time, given that lesbians identify as women and gay men as men.

During the critical periods in neurodevelopment that we believe are likely to exist in utero, we would expect other changes happening at a similar time as the development of traits that affect sexual orientation. Neuropsychological research suggests that there are, and that cognitive profiles may differ based on sexual orientation. Observations that women and men are sexually dimorphic on certain tasks such as spatial memory or verbal capacity have been used to investigate the theory that gay men are more like women and lesbians are more like men on neuropsychological tasks. In general, researchers have found that heterosexual men perform better on spatial cognition tasks than women and homosexual men, while women and homosexual men perform better on verbal and spatial memory tasks than heterosexual men. Studies regularly find no difference in spatial or verbal abilities between lesbians and other women (Rahman, 2005). Other studies have looked at differences in proficiency in motor tasks between the groups and found that straight men perform better on motor tasks, such as throwing a ball, than do gay men, and that lesbians do better than other women. Many arguments can be made against biological explanations for differences between men and women, and gay and straight people, on motor tasks. Hall and Kimura (1995) studied motor ability and argued that they controlled for sports history in their research. However, they do not indicate how their sports histories were obtained. While children who grow up to be gay or lesbian may participate in organized sports in similar numbers to their same-gender peers, this may not be true of their participation in pick-up sports and other athletic activities.

In follow-up to neuropsychological studies, EEGs have been used to demonstrate differences in event-related potentials among some groups during cognitive tasks. Men are typically more adept at mental rotation, a task that assesses spatial ability, and a study by Wegesin (1998) found that more
slow-wave activity was recorded during mental rotation for heterosexual men than for heterosexual women or homosexual men. Lesbians were found to resemble straight women on this task. Although sex differences between men and women on spatial tasks are widely accepted, new studies indicate that these differences may be influenced by the environment. Researchers at the University of Toronto in 2007 found that playing video games can decrease differences in abilities on spatial tasks between men and women (Feng et al., 2007). It may be that both women and gay men participate less as children and adults in activities that improve spatial ability, and that the differences we find on neuropsychological testing and EEG are not genetic.

Whether through histological studies or structural and functional neuroimaging, some scientists studying sexual orientation have attempted to look directly at the brain for answers. In 1990, in one of the first histological studies of the gay brain, researchers examined the suprachiasmatic nucleus of the hypothalamus, which is known to regulate circadian rhythms, and found that this area was larger in women and gay men than in straight men. In a follow-up animal study, researchers injected a group of rats with aromatase inhibitors to block the action of testosterone neonatally and found that they were more likely than other rats to be bisexual, rather than heterosexual, and had a larger than usual number of cells in the suprachiasmatic nucleus (Swaab, 2008). In 1991, Simon LeVay produced a well-known study that showed that an area in the anterior hypothalamus, called the third interstitial nucleus (INAH-3), was smaller in gay men and women than heterosexual men. LeVay’s sample size was small and a number of the homosexual men in his study had died of AIDS, which may have affected the state of their brains post mortem. After LeVay, Allen and Gorski (1992) produced a study that demonstrated that the anterior commissure, which connects the left and right temporal cortices and is believed to be linked to sex differences in cognitive abilities and language, was larger in both women and homosexual men than heterosexual men.

Recently, structural and functional neuroimaging have begun to replace histological research for the study of neurological differences in sexual orientation and in many other fields. In structural MRI studies, Savic and Lindstrom (2008) have shown differences in cerebral hemispheric volume between groups, with heterosexual men and lesbians having rightward cerebral asymmetry and homosexual men and heterosexual women having symmetrical cerebral hemispheres. Savic et al. (2005) have used functional imaging to study response to pheromones. They exposed participants to a pheromone derived from male perspiration and found that it stimulated activation of the hypothalamus of heterosexual women and homosexual men but not heterosexual men.

This group also conducted research to determine if there were functional differences between the brains of homosexual and heterosexual people in
areas of the brain that were not directly involved in sexuality. PET scans demonstrated that straight women and gay men had connections from their amygdala that differed from those of straight men and lesbians. Kranz and Ishai (2006) have used functional MRI to measure brain activity changes when subjects were shown pictures of men and women. In each case, there was a stronger activity change in the thalamus and medial prefrontal cortex when subjects were shown pictures of people who belonged to the sex to which they were attracted. Structural and functional neuroimaging promise to give us even more insight into the influence of biology on sexual orientation, but at this point they may bring us more questions than answers.

DISCUSSION

While doing research for the original presentation of this material, I came across an article from a 1977 issue of American Psychologist (Morin, 1977) that discusses the issue of heterosexual bias in research on homosexuality. The article lists four possible causes for homosexuality—parenting styles, learning models, ethnological models, and biochemical models. Though it is mentioned along with the others, the contribution of biochemical models is summed up in two sentences: “Biochemical models suggest that hormones or other physiological differences account for the development of a homosexual orientation. The results of these studies are inconclusive and frequently contradictory.”

This article, now a historic document, illustrates how far we have come in understanding neurobiological contributions to sexual orientation. Any article today would list numerous categories of biological and genetic studies. Clearly much has been accomplished in the last 30 years. However, we should continue to remind ourselves that something as complex as sexuality is almost certainly multifactorial in origin. Sexual orientation is likely shaped by many factors, including multiple genes, biological, environmental and social/cultural influences.

Sexuality is more complicated than we could ever imagine, and yet we use rather simple language to describe it. Sociobiological theory tells us that we have certain “predispositions,” and that culture overlays and shapes those. However, we assume that these predispositions are the same as the categories of sexuality that we have culturally created. We argue that people are “born” with predispositions to be gay and then those are shaped by culture. What if there is no predisposition to be gay? What if we are born with an interest in or arousal to soft things, rough things, tall or short things, old or young, passive or active, or certain smells? What if even those descriptors are too broad? Gayle Rubin makes this point by comparing sexuality to our appetite for food:
“The belly’s hunger gives no clues as to the complexities of cuisine. The body, the brain, the genitalia, and the capacity for language are all necessary for human sexuality. But they do not determine its content, its experiences, or its institutional forms. . . . It is impossible to think with any clarity about the politics of race or gender as long as they are thought of as biological entities rather than as social constructs. Similarly, sexuality is impervious to political analysis as long as it is primarily conceived as a biological phenomenon or an aspect of individual psychology. Sexuality is as much a human product as are diets, methods of transportation, systems of etiquette, forms of labor, types of entertainment, processes of production, and modes of oppression.” (Rubin, 1993)

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