

Is There a Link Between Left-Handedness and Homosexuality?

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This year, three Canadian scientists published a study which found some connection between left-handedness and homosexuality (1).

Analyzing a number of studies, their paper concludes that male homosexuals are about one third (31%) more likely than heterosexuals to be left-handed (2), while lesbians are almost twice as likely (91%) to be left-handed as heterosexual women.

The authors say that their findings support the notion that sexual orientation in some men and women has an early neurodevelopmental basis. They trace this to "disruptive events causing developmental instability." These events may modify sexual differentiation of the brain, they say, "perhaps through hormonal or immunological mechanisms."

The authors point out that left-handedness has been associated with a wide range of indicators of reduced fitness, from the standpoint of natural (Darwinian) selection. Left-handed people, the authors say, have a smaller number of offspring, higher number of spontaneous abortions, lower birth weight, higher number of serious accidents, higher rates of serious disorders, and a shorter life span. Left-handedness has similarly been linked to neural tube defects, autism, stuttering, and schizophrenia.

The authors conclude by discussing possible biological reasons for the link between left-handedness and homosexuality. Their preferred explanation is that both left-handedness and homosexuality result from "biological developmental errors."

In a related development, two recent studies reported in *Archives of General Psychiatry* found significantly higher levels of pathology in the gay population than among heterosexuals. One of several possible explanations, said researcher J.M. Bailey in a published commentary that accompanied the article, is that since evolution naturally selects for heterosexuality, "homosexuality may represent developmental error" (3).

How Significant is the Latest Study?

I would conclude that there is possibly some link between left-handedness and homosexuality, but not a highly significant one. The fact remains that most left-handed persons are not homosexual, and most homosexual people are not left-handed.

The Canadian scientists' paper is a meta-analysis, which has become an increasingly popular way of combining data from multiple studies to overcome the problems of slightly different approaches, and to pinpoint small effects which individual studies have not enough power to detect.

There are many potential traps in meta-analyses. The paper in question has avoided most of them--as one would expect, given the prominence and expertise of its best-known authors, Ray Blanchard and Kenneth Zucker.

One concern, however, is that the paper was published in a social-science rather than a medical journal. *Psychological Bulletin* was certainly a correct choice for reaching the authors' target audience (psychotherapists working with gay and lesbian clients), but it is quite doubtful the paper got a rigorous refereeing, since the number of specialists required to properly analyze the paper would likely exceed the number of informed referees usually assigned to a paper by the editorial staff of a journal. The study is severely technical; it uses odds ratios (statistics from the field of epidemiology), and refers to fetal masculinization (endocrinology), the Major Histocompatibility Complex (immunology), and fluctuating asymmetry (developmental biology).

The main caution, however, must be about the significance of the findings. Neither the authors nor I can quantify its error, because it was done using a meta-analysis. A known epidemiological rule of thumb for *individual* surveys states that, in a test-population, a prevalence of twice that in the control group is intriguing but inconclusive, and a prevalence of three is probably significant. This means that if this were an individual survey, the result of 31% above normal would be insignificant, and that of 91% above normal (about twice the control group) would be considered intriguing, but not decisive. This rule-of-thumb applies to individual surveys, but it is unknown if the rule should apply in the same manner to a meta-analysis.

Using their results, it is possible to derive a number, which shows the extent of any link there may be between homosexuality and left-handedness. Here's how it's done. Given that 2.7% of adult Western males are homosexuals and 1.7% of adult Western women female homosexuals (both figures including bisexuals, and defined as activity in the last 12 months [4]) we can calculate by standard methods that only 3.9% of left-handed males are homosexual, and only 3.3% of left-handed females are lesbian (5).

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In other words, *the overwhelming majority of those who are left-handed, do not become homosexual*. The strength of any underlying factor producing both is weak. Something unusual appears to happen to a small number of left-handed people, and their sexual-orientation development is atypical. Conversely, however, and very importantly, most homosexual people are not left-handed.

The latest study is intriguing. Nevertheless, the main routes to homosexuality would not likely be through the route that has caused some people to be left-handed.

References

1. Lalumière, M.L.; Blanchard, R.; Zucker, K.L. (2000): "Sexual orientation and handedness in Men and Women: a meta-analysis." *Psychological Bulletin* 126, 575-592.
2. Although for conciseness the term "left-handed" is used in this article, the original definition in the paper is "all those who are not exclusively right-handed."
3. Bailey, J.M., "Commentary: Homosexuality and Mental Illness," *Archives of General Psychiatry*, October 1999, vol. 56, no. 10, 876-880.
4. Whitehead, N.E.; Whitehead, B.K. (1999): *My Genes Made Me Do It!* Huntington House, Lafayette, Louisiana. 233 pages.
5. The calculation is quite easy and useful to put in perspective other alleged links. $F1 = 0.0277 * R1$ (for men) and $F2 = 0.0173 * R2$, where F1 and F2, the results, give the fraction of left-handers who are homosexual (men and women respectively), and R1 is the ratio of the percentage of left-handed homosexual men to the percentage of left-handed heterosexual men. R2 is similar but for women. The numerical factors are the ratio of homosexuals to non-homosexuals in a population, thus it is 2.7/97.3 for males and 1.7/98.3 for females. Other figures could be substituted if you think them more accurate. The formulae apply similarly to other biological factors that are alleged to link with homosexuality; only R1 and R2 change.