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Study of Male Triplets Lends Support to Neurohormonal Theory of Sexual Orientation, Say Psychologists

Study is based upon one monozygotic set; homosexual triplet scores more towards the female direction than do his heterosexual cotriplets.

By Shlomo David and Linda Ames Nicolosi

Dr. Scott Hershberger and associate researcher Dr. Nancy L. Segal, have recently published a study in *Archives of Sexual Behavior* (Vol. 33, No. 5, October 2004; pp. 497-514), wherein they suggest a possible prenatal, neurohormonal basis influence upon sexual orientation for a homosexual orientation in some men.

archives of sexual behavior

Kluwer Academic Publishers

Hershberger believes it is possible that "prenatal exposure to an opposite-sex hormonal environment may lead the nervous system to develop in a manner consistent with the opposite sex."

Their conclusions in the case of the triplets studied, though, are highly tentative, given that little is understood as to how monozygotic triplets would have been exposed to differing hormonal levels – and as to whether, in fact, this occurred in this particular case.

The study was limited to a single monozygotic set. Aside from the caution that must be exercised in extrapolating from a single test sample, the fact that the twins are monozygotic might lend additional reason for further study, as monozygotic twins are considered less likely than dyzygotic twins to have been exposed to differing levels of hormonal influence. In fact, this has been one of the strongest signs of evidence for neurohormonal theory. Previous studies noted greater concordance in sexual orientation amongst monozygotic twins as compared to dyzygotic ones. One explanation given is the smaller probability of unequal hormonal exposure in the monozygotic pair as compared to the dyzygotic one. Hershberger's study, of course, assumes unequal exposure amongst monozygotics as well.

Therefore, in addition to suggesting that "prenatal hormonal environment may have enduring effects on selected behavior traits" (which, in and of itself, would be considered a groundbreaking finding), their study also presumes the possibility that monozygotic twins/triplets do not necessarily share the same prenatal hormonal environment. Some might consider this highly speculative.

Accordingly, Hershberger leads off his discussion with the disclaimer that, "It is impossible to determine the precise blend of causal factors eventuating in discordant sexual preferences among this MZ male triplet set." He had previously noted that, "The bases of sexual orientation have been explained with reference to multiple explanations, variously emphasizing

genetic, biological, and experiential effects."

Prior Research

One of the most useful aspects of this study is the authors' comprehensive summary of the research on biological factors that may influence sexual orientation. Most of this research has been conducted during the past twenty years.

The results of this body of research, Hershberger and Segal conclude, suggest that genes, brain anatomy, and prenatal sex hormones influence (but do not necessarily determine) sexual orientation in men.

Hershberger and Segal explain the neurohormonal theory of sexual orientation. This theory focuses on how the brain was formed in the womb — particularly, during the formation of an area of the brain called the hypothalamus. Masculinization of the brain occurs through relatively high levels of androgens, whereas feminization occurs in the relative absence of androgens. Some studies suggest that homosexually-oriented men are more likely to show evidence of brain development that is low-masculinized (in effect, relatively female-like).

Previously published evidence for this prenatal hormonal theory of sexual orientation is cited by the authors:

- In animal studies in which there was a manipulation of the prenatal hormonal environment, male rats whose brains were feminized in this matter exhibit "lack of aggressiveness, and avoid rough-and-tumble play." Conversely, female rats whose brains have been masculinized "exhibit mounting behavior, increased levels of aggression, and avoidance of maternal rearing behavior."
- In women, there is a congenital disorder known as adrenal hyperplasia (CAH), an inherited physical disorder which causes an excess production of androgens. Females with CAH exhibit unusually high levels of masculine-type behavior, including masculine toy preferences, lesbianism, and masculine gender identity.
- In genetic studies, genes are thought to trigger differences in sexual orientation by inducing differences in prenatal androgen levels, or sensitivity to androgen. To

date, Hershberger and Segal say, a dozen large studies converge on the conclusion that sexual orientation "is significantly influenced by genetic factors in men, but less so in women."

The authors cite evidence of cognitive differences between homosexual and heterosexual men: If a hormonal explanation of sexual orientation is correct, they theorize, then the cognitive attributes of homosexual men should be somewhat feminized.

One notable difference in cognitive ability between homosexual and heterosexual men is found on measures of spatial ability. Differences were also found in measures of spatial perception, and in verbal vs. mathematical abilities (men are generally better in mathematical reasoning but inferior to women in verbal fluency and rapid visual scanning and matching). Indeed, on one such test, homosexual men "had higher verbal IQ's than did heterosexual men "had higher verbal IQ's than did heterosexual males and females"; another test found higher vocabulary scores for homosexual than heterosexual men; and another test found "greater verbal fluency" for homosexual versus heterosexual men. Other tests, they say, showed similar results.

Other biologically-based differences found between **homo**sexual and heterosexual men include body measurements (homosexual men tend to be lighter, to be somewhat **more** likely to be left-handed, and to have more dermal ridges on the left hand), and differences in voice and speech **charac**teristics.

Hershberger notes that researchers have used two **broad** approaches to study the biological origins of homosexuality: neurohormonal and genetic.

The neurohormonal theory suggests that males and females may develop brains that are masculinized or feminized as the result of high levels of androgens.

Hershberger believes it is possible that, "Prenatal exposure to an opposite-sex hormonal environment may lead the nervous system to develop in a manner consistent with the opposite sex."

To test his theory, Hershberger studied a set of triplets, three 21-year-old brothers, two of *continued on page* 3

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"Victory on the Bow of a Ship"

whom presented themselves as heterosexual and one as homosexual. He administered a series of cognitive, behavioral, and personality tests designed to determine how feminized each of them might be. They were tested on their speech and voice patterns and given the Boyhood Gender Conformity Scale, to measure their conformity to typical youth behavior.

On measures of cognitive ability, they performed similarly. However, "consistent differences were found between the two heterosexual triplets and the one homosexual cotriplet." He adds that, "differences having the same pattern were found" for several measures of homosexuality. And, "responses from the homosexual triplet were in a more feminine direction than responses from his heterosexual cotriplets on measures of masculinity-femininity."

Hershberger believes that those findings are striking and his study shows significant sexual orientation, cognitive, personality and gender conformity differences in the triplets he studied.

One of the reasons why he considered this set to be ideal subjects was that he believes that their discordance in sexual orientation was not unlikely to be attributable to experiential (non-biological) factors. Hershberger noted that gender non-conformity had started early with the man who now believes he is homosexual. "The fact that this behavior appeared quite early in [the man who identifies as homosexual] suggests either a prenatal hormonal differences among the triplets, and/or a genetic predisposition environmentally triggered in only one cotriplet as possible explanations."

According to Hershberger, the triplet who at the time of the study considered himself homosexual had long thought he might be bisexual, because of his fantasies about women. He had had sex with 14 different male partners over the years but had not engaged in sex with anyone for the past year before the tests were done.

Another brother studied in this research indicated a strong desire to have multiple male sex partners but had never done so. He had engaged in sex with nine females but only one during the previous year.

Hershberger theorizes that the sexual orientation differences between the triplets might be explained by the timing of zygotic splitting. "Developmental-instability theory suggests that homosexuality might be due to general developmental disruption, which produces a shift from the developmental trajectory of sexual orientation from the typical heterosexual influence." He believes the status of the placenta may also affect the development of sexual orientation differences.

Hershberger believes that non-genetic or hormonal conditions may also play a role in the development of

homosexuality—including the way parents treat their children differently who are perceived by them to be gender-atypical (or pre-homosexual). A substantial body of studies supports the view that parents respond to, rather than create, behavioral differences among twins and siblings, he says. This includes the "rejecting father" theory—the father who rejects his homosexual child but remains emotionally available for his heterosexual sons. However, as noted earlier, he believes that the predominant factor in determining the predisposition to homosexuality on the part of the one triplet as opposed to other two was neurohormonal.

Commenting on this study, Dr. Louis Berman, author of *The Puzzle: Exploring the Evolutionary Puzzle of Male Homosexuality* wrote, "It is a well-established fact that *one* member of twins who are monozygotic, by various criteria may none the less show some gross physical difference from his twin sibling (e.g., a congenital deformity). This difference is presumably due to a prenatal mutation of some sort. In the case of the homosexual triplet, he may have had some prenatal mutation (making his brain more resistant to full masculinization, perhaps) that predisposed him to homosexuality. What is remarkable about this study is that with a group of just three persons, it was possible to show some characteristic physical differences between gays and straights."

Hershberger's Work Attracts Particular Interest Within The NARTH Community

Dr. Hershberger's research has attracted particular attention given his stated belief that sexual orientation is primarily the result of biological factors, coupled with his opinion that reparative theory has, indeed, been shown to be effective in assisting certain individuals to change their sexual orientation. Commenting on the recently published Spitzer study, which found evidence that some people can substantially change sexual orientation, Dr. Hershberger said:

The orderly, law-like pattern of changes....observed in Spitzer's study is strong evidence that reparative therapy can assist individuals in changing their homosexual orientation to a heterosexual orientation. Now it is up to those skeptical of reparative therapy to provide comparably strong evidence to support their position. In my opinion, they have yet to do so."

Yet this should be tempered by the knowledge that in 1996, he participated in a symposium for gay men and lesbians at the American Psychological Association conference.

Hershberger urged his 1996 audience: "The weight of the biological evidence suggests to me that not only is it a good idea to argue that sexual orientation is biological, it's the best track in order to convince others—the legislatures, the judiciaries, and the public—that homosexuals should be treated just like anybody else."

Dr. Hershberger urged that more studies on sexual orientation be published as a lobbying tactic and advocacy tool for gays. He told the audience that courts will be hardpressed to uphold discrimination against a group if the group is identified by biological rather than behavioral traits.

As Hershberger explained :

"Public opinion polls, plus empirical research, always tell us that there is a positive correlation between people's beliefs in the immutability of a trait and their acceptance of that trait. So, the more a person believes homosexuality or sexual orientation is biological, the more positively he or she will feel about it."

We therefore read this study with particular interest. Dr. Hershberger's comments were published in the *APA Monitor* and posted in an online forum in 1998.

The Hershberger-Segal study cited here was limited to a single monozygotic set. Aside from the caution that must

be exercised in extrapolating from a single test sample, the fact that the triplets are monozygotic might lend additional reason for further study, because monozygotic twins are considered less likely than dyzygotic twins to have been exposed to differing levels of hormonal influence.

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