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Comparison of Height and Weight in Homosexual Versus Nonhomosexual Male Gender Dysphorics

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The authors' clinical impression that homosexual gender-dysphoric males are physically smaller than nonhomosexual gender-dysphoric males was tested. Subjects were 176 homosexual and 246 nonhomosexual male outpatients, ages 16 to 65, who complained of discontent with their biological sex. Compared with the nonhomosexual male gender dysphorics, the homosexual gender dysphorics were shorter, lighter, and lighter in proportion to their height. The homosexual gender dysphorics were also shorter than men in the general population, whereas the nonhomosexual gender dysphorics were not. The smaller physiques of homosexual gender-dysphoric men may partly explain the clinical observation that these patients are somewhat more successful in passing as women.

KEY WORDS: gender dysphoria; height; homosexuality; transsexualism; weight.

INTRODUCTION

Over the past century, attempts to explain the etiology of male homosexuality have predominantly been psychosocial in nature (e.g., Bieber *et al.,* 1962; Storms, 1981). More recently, however, there has been an increase in the study of possible biological correlates. With few exceptions (e.g., McCormick *et al.,* 1990; Swaab and Hofman, 1990), the biological parameters of interest have been ones that show sex-dimorphic differences in the general population of men and women (Allen and Gorski, 1992; Dörner *et al.,* 1975; Gladue *et al.,* 1984, 1990; LeVay, 1991; McCormick and Witel-

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son, 1991; G. Sanders and Ross-Field, 1986a, 1986b; Willmott and Brierley, 1984). The trend to understand and study male homosexuality from the perspective of somatic feminization may have been accelerated by findings that early feminine behavior in males is predictive of later homosexuality (e.g., Bailey and Zucker, 1995; Green, 1987; Zuger, 1984).

Among the sex-dimorphic variables that have been studied comparatively in homosexual and heterosexual men are height and weight. Several studies have found that homosexual men are lighter, or lighter in proportion to their height, than heterosexual controls (Blanchard and Bogaert, 1994; Evans, 1972; Gettelman and Thompson, 1993; Herzog *et al.,* 1991; Nedoma and Freund, 1961; Tourney *et al.,* 1975). Others have produced nonsignificant differences in the same direction (R. M. Sanders *et al.,* 1985; Terman and Miles, 1936) or differences that would have been significant if the investigators had performed a one-tailed test of the (directional) hypothesis that homosexuals tend to weigh less than heterosexuals (Silberstein *et al.,* 1989). We know of only one investigation with an adequate sample size that found no tendency for homosexual men to be lighter (Yager *et al.,* 1988). Fewer studies have compared the mean heights of heterosexual and homosexual males; in contrast to the studies of weight, these have found no differences (Blanchard and Bogaert, 1994; Evans, 1972; R. M. Sanders *et al.,* 1985; Tourney *et al.,* 1975).

The above findings for weight are consistent with our informal observations regarding homosexual versus nonhomosexual gender dysphorics. Gender dysphorics are individuals with persistent and recurrent dissatisfaction with their anatomic sex; these include transsexuals as well as persons with less severe forms of gender identity disorder, for example, men who wish to have feminine breasts but not a vagina. Gender-dysphoric males may be classified into two broad groups: homosexual (erotically attracted to other males) and nonhomosexual (attracted to females, to both sexes, and to neither sex) (Blanchard, 1985, 1988, 1989a, 1989b). It has been our clinical impression that homosexual gender-dysphoric patients are smaller, and therefore better able to "pass" as women, than nonhomosexual patients. The present study was conducted to ascertain whether our impression that homosexual gender dysphorics have smaller physiques is borne out by objective findings.

METHOD

Subjects

The sample, described in detail in a previous article (Blanchard and Sheridan, 1992b), consisted of male outpatients who presented at the Gen-

der Identity Clinic of the Clarke Institute of Psychiatry (Toronto, Ontario, Canada) because of discontent with their biological sex. Other data from this sample have been analyzed in two previous studies (Blanchard and Sheridan, 1992a, 1992b). Criteria that disqualified subjects included major mental illness, mental retardation, gross physical abnormalities, and chromosomal abnormalities (Blanchard and Sheridan, 1992b). Blacks were also excluded from the sample because they differ from other groups with regard to sex ratio at birth, a variable of primary interest in the original study.

For this study, we had to exclude data from 34 subjects who lacked height and weight information. We further excluded all 10 Orientals, Filipinos, and aboriginal Canadians. The remaining 422 subjects were white.

All subjects had already been classified as homosexual or nonhomosexual for purposes of the previous research (Blanchard and Sheridan, 1992b). Subjects classified as nonhomosexual included those erotically attracted to females, those attracted to both sexes, and those attracted to neither sex. The rationale for this grouping of gender-dysphoric males has been explained in several previous articles, which also reported a variety of empirical findings that validate it (Blanchard, 1985, 1988, 1989a, 1989b). The 176 homosexual subjects had a mean age of 25.2 years (range, 16–52 yrs), and the 246 nonhomosexual subjects had a mean age of 34.6 years (range, 18–65 yrs).

Materials and Procedure

Height, weight, the date when height and weight were recorded (used to compute subjects' ages), and race were taken from the subjects' clinical charts. In 52% of cases, the subject's height and weight had been reported by two physicians in separate physical examinations. In 28% of cases, these data were reported by one physician; and in 14%, by one physician and by the subject himself on an application form for assessment at our clinic. There were only 6% of cases in which the sole source of information was the subject himself; the data suggested, in any event, that the subjects' information was as reliable as the physicians'.

Whenever there were multiple sources of information, these were cross-checked. Small discrepancies in height or weight were resolved by taking the average of the differing values. In the case of large discrepancies (probably resulting from clerical errors), the more probable value could always be determined from statements in other clinical reports, for example, a description of the subject as "slender" or "stocky." The data were extracted from the charts (and averaged when necessary) by the third

author, who did not know whether the subjects had been classified as homosexual or nonhomosexual.

RESULTS

The distribution of body weights in the two groups is shown in Fig. 1. The mean weight of the homosexual group was 64.57 kg (SD = 11.76), and that of the nonhomosexual group was 72.37 kg (SD = 12.36). Because the nonhomosexual subjects were also older, it was necessary to control for the effects of age on weight before evaluating the weight difference between the two groups.

We had expected that the relation between weight and age might be curvilinear. That expectation was reinforced by a scatterplot of the full sample, which suggested that the weight increase apparent in young adulthood leveled off somewhat in middle age. We therefore decided to model this relation as a second-degree polynomial, and to control for the effects of age when evaluating the weight difference by simultaneously covarying age and age-squared.

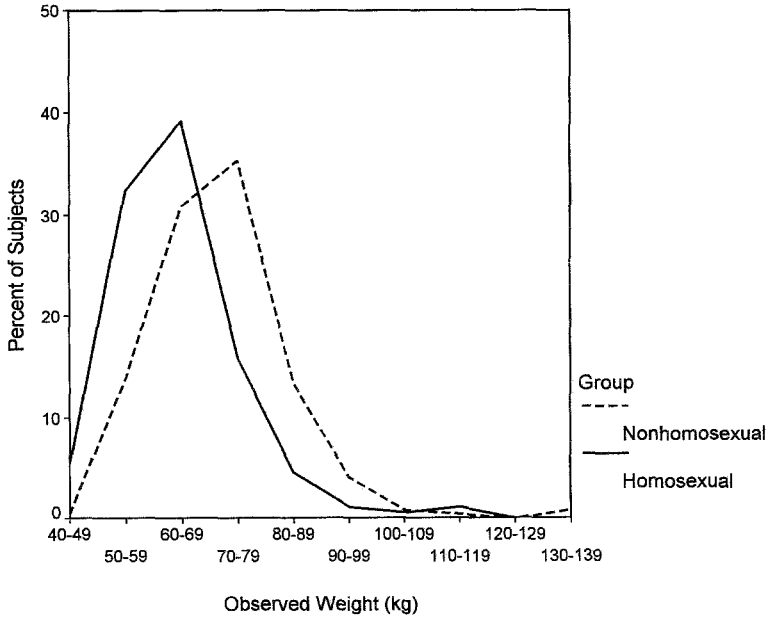

Fig. 1. Frequency distribution of observed weights in the two groups.

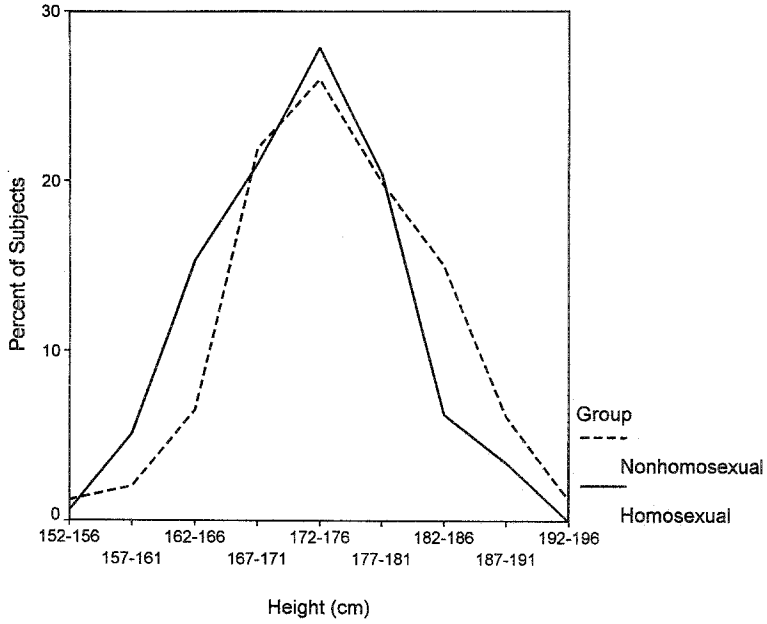

Fig. 2. Frequency distribution of body heights in the two groups.

We examined the weight difference between the two groups using BMDP's one-way analysis of covariance (ANCOVA), program 1V (Engelman, 1990), because it provides a statistical test of the assumption, necessary to covariance analysis, that the slope of the regression line for each covariate is the same in each group (i.e., that the lines are parallel). The tests for parallelism showed that there was no difference between the two groups in the relation of weight to age, $F(1, 417) = 0.36$, NS, or to age-squared, $F(1, 417) = 0.14$, NS. Thus an ANCOVA was justified. The unstandardized regression coefficients showed that weight was positively related to age, $B = 1.24$, $F(1, 418) = 12.27$, $p = 0.0005$, and negatively related to age-squared, $B = -0.01$, $F(1, 418) = 8.51$, $p = 0.0037$. The latter finding confirmed our expectation that the relation between weight and age would be curvilinear. After adjustment for age, the mean weight of the homosexual group was 4.66 kg less than that of the nonhomosexual group. This difference was statistically significant, $F(1, 418) = 11.61$, $p = 0.0007$.

The distribution of heights in the two groups is shown in Fig. 2. The mean height of the homosexual group was 172.94 cm (SD = 7.11), and

that of the nonhomosexual group was 175.70 cm (SD = 7.67). Because there was no relation, in this sample, between age and height, these means were compared with a simple t test. The 2.76-cm difference in height was statistically significant, $t(420) = 3.75$, $p = 0.0002$ (two-tailed).

To determine which of the two groups differed in height from the general population, we obtained height data from a survey of 1295 Canadian males (Canadian Fitness and Lifestyle Research Institute, 1988). The mean heights for adult men in this survey were as follows: age 20–29, 177 cm; age 30–39, 176 cm; age 40–49, 174 cm; age 50–59, 174 cm; and age 60–69, 173 cm. We compared each subject's observed height with the Canadian norm for his age range using a paired-samples t test. Subjects younger than 20 were excluded from this analysis for lack of appropriate norms. On average, the nonhomosexual subjects were only 0.10 cm shorter than the norm for their age. The difference was not statistically significant, $t(242) = -0.20$, NS. In contrast, the homosexual subjects were 3.23 cm shorter than the norm for their age. This difference was significant, $t(137) = -5.47$, $p < 0.0001$ (two-tailed).

The findings for height raised the question of whether the homosexual subjects weighed less only because they were shorter, or whether they also weighed less in proportion to their height. We investigated this with a second ANCOVA for weight, this time controlling for height as well as age and age-squared. The tests for parallelism showed that there was no difference between the two groups in the relation of weight to height, $F(1, 416) = 1.21$, NS. The unstandardized regression coefficients showed that weight was positively related to height, $B = 0.71$, $F(1, 417) = 105.23$, $p < 0.0001$, and (still) positively related to age, $B = 1.07$, $F(1, 417) = 11.36$, $p = 0.0008$, and negatively related to age-squared, $B = -0.01$, $F(1, 417) = 7.08$, $p = 0.0081$. After adjustment for age and height, the mean weight of the homosexual group remained 2.74 kg less than that of the nonhomosexual group. The adjusted difference was statistically significant, $F(1, 417) = 4.91$, $p = 0.0273$.

The distribution of adjusted weights in the two groups is shown in Fig. 3. Adjusted weights for individual subjects were computed with the formula, adjusted weight = observed weight + $0.71 \times (174.55 - \text{height}) + 1.07 \times (30.70 - \text{age}) - 0.01 \times (1043.90 - \text{age}^2)$, where 0.71, 1.07, and -0.01 are the unstandardized regression coefficients, and 174.55, 30.70, and 1043.90 are the grand means for height, age, and age-squared, respectively.

DISCUSSION

Compared with nonhomosexual male gender dysphorics, homosexual gender dysphorics are shorter, lighter, and lighter in proportion to their

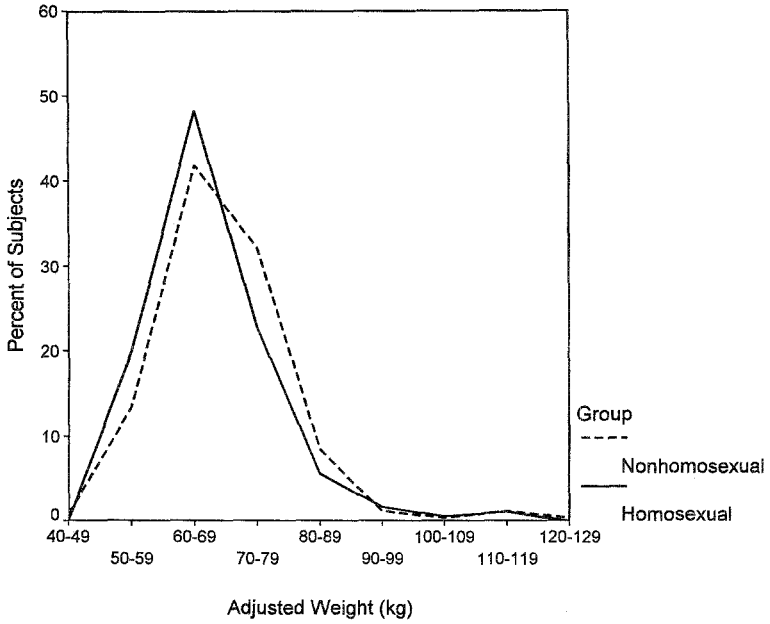

Fig. 3. Frequency distribution of body weights, adjusted for height, age, and age squared.

height. Homosexual gender dysphorics are also shorter than men in the general population, whereas nonhomosexual gender dysphorics are not. These physical differences may partly explain the clinical observation that homosexual gender dysphorics are somewhat more successful in passing as women (Steiner, 1990), although behavioral factors are probably also contributory.

The measures of height and weight used in this study were recorded more casually than they would have been if the study had been planned in advance and the examining physicians instructed to measure the subject's height and weight with special procedures or with special care. It is therefore necessary to consider the effect of inaccuracy of measurement on the present findings. It is well known that the effect of random measurement errors is to make it more difficult to demonstrate a statistically significant difference between two or more independent groups (see, e.g., Blalock, 1972, p. 414). Thus, our findings of significant height and weight differences were obtained despite random measurement errors, not because of them. The fact that these anatomic differences emerged under suboptimal conditions of measurement actually argues for their robustness. If there were

systematic measurement errors—if, for example, the examining physicians tended to measure the height of homosexual subjects with their shoes off and the height of nonhomosexual subjects with their shoes on—then our results would be invalid. There is no reason, however, to suspect the presence of systematic errors in our height and weight data. The last of these measurements was recorded several years before this study was ever thought of. It is therefore difficult to see how or why the examining physicians—who recorded the subjects' heights and weights in the course of routine clinical examinations, not as part of a research protocol—could have unconsciously biased their measurements in some systematic fashion.

One explanation for the observed difference in weight (although not, of course, the difference in height) might be that this is secondary to a higher rate of HIV infection in the homosexual group. This seems to us extremely unlikely. To our knowledge, only one of the patients in the present sample has ever tested positively for HIV, and this individual was not underweight when examined.

Another possible explanation for the difference in weight between the two groups is a greater vulnerability of homosexual males to eating disorders. It has been reported that homosexuals constitute a large proportion of men with such disorders (Fichter and Daser, 1987; Herzog *et al.*, 1984, 1991; Robinson and Holden, 1986; Schneider and Agras, 1987). We have not, however, encountered any homosexual gender-dysphoric patients who have complained of, or have been treated for, clinical eating disorders. There is, moreover, no reason to assume that homosexual gender-dysphoric men would be more preoccupied with dieting than nonhomosexual gender-dysphoric men, who are often concerned to reduce their bulk in order to approximate female dimensions. Thus, although the weight difference between nonhomosexual and homosexual gender dysphorics may in fact be secondary to behavioral differences, the nature of these behavioral differences is not obvious.

An important unexamined question about the weight difference between homosexual and heterosexual men is what the gross difference actually reflects. The lighter body weight of homosexual men need not reflect a lesser quantity of fat. It might instead reflect a lighter skeleton, a lesser muscular mass, or both. This issue would have to be resolved by more specific anthropometric measures. It should be noted that a finding of lesser muscular mass in homosexual men would not necessarily be constitutional in origin. This could be a residual effect of lower rates of participation of homosexual youth in team sports—a difference also observable in homosexual versus nonhomosexual gender-dysphoric males, at least in their childhood and adolescence.

A final question about weight is whether all homosexual males, or only feminine homosexual males, tend to be lighter than their heterosexual counterparts. This question is raised in a study by Weinrich *et al.* (1992) which suggests that feminine homosexual men are lighter in weight than masculine homosexual men. It is true that other researchers also found homosexual–heterosexual weight differences using homosexual subjects who were not selected for their femininity (Blanchard and Bogaert, 1994; Evans, 1972; Gettelman and Thompson, 1993; Herzog *et al.,* 1991; Nedoma and Freund, 1961; Silberstein *et al.,* 1989; Terman and Miles, 1936; Tourney *et al.,* 1975). It is possible, however, that the differences in their studies were produced by the more feminine homosexuals in their samples, who brought down the weight average for their whole group.

A difference in height between homosexual and heterosexual men has not been reported previously. This finding is of particular importance because final adult height is relatively stable after the cessation of pubertal growth and therefore not subject to most medical, psychological, or environmental influences. The discrepancy between our result and the negative findings of other studies (Blanchard and Bogaert, 1994; Evans, 1972; R. M. Sanders *et al.,* 1985; Tourney *et al.,* 1975) may relate to the fact that our subjects consisted of extremely feminine homosexuals. This could be resolved in future research by comparing the adult stature of gender-dysphoric homosexuals (who are virtually always extremely feminine), masculine homosexuals, and appropriately matched heterosexual controls.

One explanation of our finding that the homosexual subjects were shorter than the nonhomosexual subjects is that the homosexual group had shorter parents. This seems unlikely for two reasons. First, it is improbable that the homosexual group would have had shorter parents than the nonhomosexual group through chance alone, particularly with samples this large. Second, it is difficult to conceive of any biological or psychosocial reason why parents' height should be correlated with their sons' sexual orientation. One cannot, however, rule out the possibility that there is some such correlation, brought about by currently unknown factors. For this reason, parental height should be controlled for in future studies.

If the height difference between gender-dysphoric homosexuals and otherwise comparable males should prove reliable, then the proximal cause of this difference might be divergent patterns of pubertal growth. Several studies have shown that homosexual men in general reach puberty earlier than heterosexual men (Bieber *et al.,* 1962; Blanchard and Bogaert, 1994; Cole, 1983; Kinsey *et al.,* 1948; Manosevitz, 1970, 1972; McCormick, 1990; Saghir and Robins, 1973; Stephan, 1973; Tripp, 1982). Other things being equal, an earlier pubertal age results in a shorter adult stature (Tanaka *et al.,* 1988; Underwood and Van Wyk, 1992). Obviously, the somewhat ac-

celerated pubertal age of ordinary homosexual men is not sufficient to produce an observable reduction in their adult height (Blanchard and Bogaert, 1994; Evans, 1972; R. M. Sanders *et al.,* 1985; Tourney *et al.,* 1975), or at least one demonstrable in less than huge samples. It is possible, however, that the pubertal age of gender-dysphoric homosexuals is even earlier than that of ordinary homosexuals and does result in a detectable lowering of adult stature. Another possibility is that the stature of homosexual gender dysphorics relates to the intensity of their pubertal growth spurt—another major determinant of adult height (Underwood and Van Wyk, 1992)—rather than its timing. Such a relation would be impossible to establish with retrospective data and would require a prospective study of extremely feminine boys, the great majority of whom prove homosexual in adulthood (Green, 1987; Zucker, 1990).

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