

of whom had bulimia, with a similar group of female patients. Two series of male bulimic patients with five cases (Dunkeld Turnbull *et al*, 1987) and nine cases (Robinson & Holden, 1986) have also been described. Surveys of the population, which have mainly been conducted on college students, give a prevalence of male bulimics as 0.4–5% of the college population (e.g. Pyle *et al*, 1983).

A few of the series have mentioned the sexuality of the patients. Three of the nine patients described by Robinson & Holden (1986) were homosexual, and Herzog *et al* (1984) noted that male patients were significantly more likely to report being homosexual than female patients. He postulated that the greater cultural pressure on homosexual men to be thin and attractive places them at a greater risk of developing eating disorders. If eating disorders are in fact more common in homosexual men than in the male population as a whole, it is perhaps not surprising to see referrals to a psychiatric liaison service which works in close conjunction with a medical team whose patients with HIV infection are mostly homosexual men. Further research to elicit the prevalence of eating disorders in homosexual men who are both seronegative and seropositive for HIV, is necessary to discover the implications of these conditions in this population.

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Homosexuals who are Twins

A Study of 46 Probands

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Forty-six homosexual men and women who were twins took part in a study of their sexuality and that of their co-twin. Discordance for sexual orientation in the monozygotic pairs confirmed that genetic factors are insufficient explanation of the development of sexual orientation. There was a high level of shared knowledge of sexual orientation between members of twin pairs, and a relatively high likelihood of sexual relations occurring with same sex co-twins at some time, particularly in monozygotic pairs. The implications

of these results for the study of the origins of sexual orientation and for twin research are discussed. *British Journal of Psychiatry* (1992), **160**, 407–409

Studies of homosexuals who are twins has centred almost exclusively on a search for genetic factors. The best known of the early studies was that by Kallman (1952) who reported 100% concordance for homosexuality in 37 pairs of monozygotic twins and

12% concordance in 26 pairs of dizygotic twins. His method of ascertainment has been criticised, however, and no subsequent study has claimed such high concordance. Nevertheless, perhaps in the wake of the then-recent Kinsey data (Kinsey *et al*, 1948), his work was painstaking in its delineation of the spectrum of sexuality. Most other reports have been based on small samples or single case reports (e.g. Heston & Shields, 1968; Eckert *et al*, 1986) and results have been equivocal. Index twins have often been ascertained from psychiatric case registers or the clinics of psychiatrists and are, therefore, unrepresentative of homosexual twins (Heston & Shields, 1968).

This study was prompted by an observation of a high proportion of twins in a group of randomly selected HIV antigen positive homosexual men (6 out of 30) who were being studied as part of a drug trial. Several of them discussed the extent of their knowledge of their co-twin's sexuality. As studies have generally failed to support heredity as a complete explanation of sexual orientation, it has been argued that genetic factors may predispose individuals to environmental influences leading to a homosexual orientation, or that intense identification or other factors related to twinship might explain higher concordance rates (Wakeling, 1979). Sexual attraction between same-sex twins has occasionally been reported (e.g. Myers, 1982; Eckert *et al*, 1985), but twins reared together have usually denied this (Kallman, 1952; Heston & Shields, 1968). Although much has been written of the close affinity between, particularly monozygotic, twins, little is known of the likelihood of incest and even less is known about twinships where at least one member is homosexual. Our aim was to examine concordance for sexuality and the extent of shared knowledge and physical attraction between twin pairs in which at least one member is homosexual.

Method

Notices were placed in several local and national 'gay' periodicals requesting homosexual men and lesbians who were twins to contact us. Little information was given in the notice about the study, except to stress that we wanted to contact all such men or women, regardless of whether they considered that their co-twin was also of homosexual orientation. Each subject who contacted us was posted a questionnaire on the following:

- demographic details
- details of sibling(s) and co-twin
- sexual orientation and sexual behaviour of the respondent, and where known, that of the co-twin
- extent of shared knowledge between the twins about each other's sexuality

- feelings of attraction towards, or sexual interaction with, the co-twin.

The questionnaire was semi-structured but with space for additional comments by the respondent. Due to the sensitive nature of our inquiries we did not attempt to seek confirmatory information from co-twins.

Subjects were asked whether they were members of identical or non-identical twinships. It has been estimated that any method of establishing zygosity will fail by about 5% against immunological typing. Accepting an error rate of 2-5%, it has been suggested that the most cost-effective method is to ask twins to classify themselves. At least six independent studies have indicated that twins may classify themselves correctly within that range of accuracy (Hrubec & Robinette, 1984).

Results

Forty-eight people responded to our notices, of whom 46 returned completed questionnaires. Our respondents were predominantly young men (38 males, 8 females; mean age 31.8 (s.d. 9.25) years, range 18-60) of middle to higher social class. Forty-five identified themselves as primarily homosexual and one as bisexual, 42 were single and four had been married at some time. Twenty (43%) claimed they were identical (or monozygotic), 23 (50%) non-identical (or dizygotic), two were unsure but considered themselves dizygotic and one was a trizygotic triplet. In 33 pairs, the co-twins were of the same sex as the respondent; 20 were the monozygotic pairs and 13 were dizygotic.

All except one respondent were 'fairly sure' or 'certain' of their co-twin's sexual preference. In 25 instances, the co-twin had actually discussed their sexuality with our respondent. Only nine (20%) subjects claimed that their co-twin was also homosexual and one of these was the female triplet who claimed that her brother was homosexual and her sister heterosexual. There was little difference in concordance between monozygotic and dizygotic pairs (Table 1). The majority (41) claimed that their co-twins were aware of their (the proband's) homosexuality.

Five men and two women (15%) reported having had homosexual relations with their co-twin at some time in the past. Two of these reported that the sexual relationship had been prolonged, in one case continuing after the marriage of the co-twin. Thus, seven (5 male, 2 female) of 33 (21%) twins from same-sex pairs reported having had a homosexual relationship with the co-twin. Of these seven, one was from a dizygotic, and six were from monozygotic pairs. Nevertheless, in five of these seven cases,

Table 1
Sexual orientation of the co-twin¹

| | Homosexual | Bisexual | Heterosexual |
|-------------|------------|----------|--------------|
| Monozygotic | 2 | 3 | 15 |
| Dizygotic | 2 | 1 | 22 |

1. One triplet with one homosexual and one heterosexual sib is not included.

the respondent considered their co-twin as heterosexual. Of seven respondents regarded the sexual relationship positively. In only one case was the fact of this sexual relationship known by any other person besides the twins. One of the remaining twins reported that they had been sexually attracted to their co-twin whether that twin was the same or opposite sex.

Discussion

Our knowledge, this group of homosexual men and women who are members of twin pairs is the largest reported to date. There are important implications to the study, however, since this was a self-selected group examined by postal questionnaire and no confirmatory information was sought from their co-twins. Nevertheless, there are two principal findings. First, the discordance for sexual orientation in both monozygotic and dizygotic pairs is striking and confirms that genetic factors are an insufficient explanation of the development of sexual orientation. This result occurred despite possible biases towards concordance, such as homosexual probands exaggerating the chances that their twin might also be homosexual, or those having a homosexual co-twin finding the research more pertinent.

Second, there was a high level of shared knowledge about sexual orientation between members of twin pairs, and a relatively high likelihood of sexual relations occurring with same-sex co-twins at some time, particularly in monozygotic pairs. Where sexual activity occurred between the twins it did not mean that the co-twin was necessarily homosexual; in fact, these data indicate the reverse. Our findings give little support to theories of 'intense identification' leading to raised concordance for homosexuality in twins.

Why might such intimacy occur, especially as a recent family-history study of sexual orientation indicates that sexual activity between brothers is rare (Hart & Weinrich, 1986)? There may be something particular about being twins that predisposes to this intimacy. Galton (1883) was the first to suggest that the twin in a pair may take the lead. Although partnership can take many forms, perhaps the most honest differentiating relationship which develops between monozygotic twins is that of dominance-submissiveness (Shields, 1962). Thus, where sexual intimacy did take place, the respondent in this study might have been the dominant twin of the pair. There is a lack of knowledge about the extent of incest between twins of all types. It has been suggested that because of the uniqueness of their relationship to each other and regardless of their sexual orientation, monozygotic twins might find

that developing sexual relationships later in life is difficult and subject to a conflict of loyalties. Monozygotic twins may be especially prone to develop sexual dysfunction with partners or spouses (Myers, 1982), perhaps reflecting this emotional ambivalence.

How do these findings inform future research into the origins of sexual orientation? It is clear that our current genetic and psychological theories are untenable. The co-twins of men and women who identify themselves as homosexual appear to have a potential for a range of sexual expression. Although this is a sensitive area, more detailed exploration of the sexual relationships between twins and their later development may cast more light on the origins of sexuality than a narrow search for genetic factors.

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