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Is a Homosexual Orientation Irreversible?

By N. McCONAGHY

Summary. In four studies homosexual patients were randomly allocated to receive either different forms of aversive therapy; or aversive therapy or a positive conditioning procedure. Before and after therapy the patients' sexual orientation was determined by measuring their penile volume responses to moving pictures of nude men and women.

The aversive therapies produced reduction in homosexual feelings and behaviour. In the fourth study the reduction was significantly greater following the aversive compared with the positive conditioning procedure. No significant change in measured sexual orientation occurred in the patients who received aversive therapy compared with those who received positive conditioning. The measured sexual orientation of the homosexual patients after treatment differed significantly from that of heterosexual patients who received aversive therapy for sexual anomalies.

Several reports exist of homosexual patients becoming exclusively heterosexual after psychotherapy (Woodward, 1956; Bieber, 1962) and behaviour therapy (MacCulloch and Feldman, 1967).

A subject's sexual orientation is judged by most psychiatrists largely on the basis of the subject's statements concerning his awareness of the degree to which he is sexually aroused by members of the opposite as compared to members of the same sex. At the same time most psychiatrists believe that many subjects deny, both consciously and unconsciously, awareness of sexual feelings, particularly homosexual feelings. In the light of this belief, the term 'sexual orientation' is used clinically to mean the subject's postulated 'true' sexual orientation, the one of which he would be aware if he were not practising denial.

Freund (1963) introduced an objective method of assessing male subjects' sexual orientation by measuring their penile volume changes to pictures of nude men and women. McConaghy (1967) and Barr and McConaghy (1971) confirmed that such measurements correlated highly with male subjects' reported awareness of their sexual orientation.

If treatment altered male homosexual subjects' 'true' sexual orientation, it would be expected that it would also produce a meaningful change in the subjects' penile volume responses to pictures of nude men and women. The studies to be reported investigated whether such a change occurred.

Method

Penile volume changes were measured by the method described by McConaghy (1967). The pictures of nudes were presented in a moving film. It contained at minute intervals a ten second moving picture of a nude woman or a nude man. Ten pictures of women and ten of men were shown in alternation.

On each occasion a subject saw the film the difference in his ten penile volume responses to the pictures of women compared with his ten responses to pictures of men was tested by the Mann-Whitney U-test. This provided a U-score for the assessment of the subject's response to the film which approached 100 the more his penile responses to the pictures of women exceeded those to the pictures of men, and approached 0 the more his responses to the pictures of men were greater. One

hundred and fifty seven homosexual patients were treated with various forms of behaviour therapy in four studies. No patient treated in one study was included in a further study.

Study 1

Forty male homosexual patients referred for aversive therapy were randomly allocated to two groups to receive either apomorphine therapy or aversion-relief therapy. The patients in the two groups were randomly allocated to two further groups, making four groups in all. The sexual orientation of patients in two groups (one allocated to receive apomorphine therapy, and one allocated to receive aversion-relief) was assessed by the film procedure immediately before their commencing treatment. These two groups were called immediate treatment groups. The sexual orientation of the patients in the other two groups (one allocated to receive apomorphine therapy and one allocated to receive aversion-relief) was assessed by the film procedure three weeks before as well as immediately before their commencing treatment. These were called delayed treatment groups. Both forms of treatment were administered over five consecutive days. Three weeks after commencing treatment all patients had their sexual orientation assessed once more by the same method. Changes in the measures of sexual orientation before and after treatment for subjects in the immediately treated groups could thus be compared with changes occurring over the same period of time without treatment, in the measures of orientation for subjects in the delayed treatment group. Further details of this study are available elsewhere (McConaghy, 1969, 1970).

Study 2

Forty male homosexual patients referred for aversive therapy were randomly allocated to receive apomorphine therapy or avoidance conditioning. The design of the study was similar to that of Study 1. Further details are available elsewhere (McConaghy *et al*, 1972).

Study 3

Forty-six male homosexual patients referred for aversive therapy were randomly allocated to receive one of three treatments—classical, avoidance, or backward conditioning. The therapy was administered on five consecutive days. The sexual orientation of all subjects was assessed by the film procedure before their commencing treatment and again four weeks later. Further details are available elsewhere (McConaghy and Barr, 1973).

Study 4

Thirty-one male homosexual patients referred for behaviour therapy were randomly allocated to receive classical aversive therapy, or positive conditioning. With positive conditioning, pictures of nude women were associated initially with pictures of nude men and later with pictures of heterosexual relationships. The patients were further randomly allocated to receive the classical aversive or positive conditioning procedure according to a forward or backward conditioning paradigm. The design of the study was similar to that of Study 3. Further details are available elsewhere (McConaghy, 1975).

Subjects were requested to return for a further film assessment of their sexual orientation at six months after treatment in Study 2, and at twelve months after treatment in Studies 1, 3 and 4. The patients were interviewed concerning any change in their sexual feelings and behaviour on each occasion they attended for the sexual orientation assessment following treatment. From their report at each interview of the amount of sexual interest they felt towards men and women and the amount and nature of their sexual fantasy and behaviour, an estimate was made of change in the patients' heterosexual and homosexual desire.

Subjects

In the first three studies all persons conscious of homosexual feeling who wished to have this reduced or eliminated and who were not overtly psychotic were accepted for treatment. In the fourth study patients awaiting sentence for sexual offences were not accepted for treatment. The majority of patients in the four studies were referred by other psychiatrists. Their age range, marital status, heterosexual and homosexual experience, Kinsey ratings and legal difficulties are reported in Table I.

TABLE I
Characteristics of patients in the four studies

Study	Number of patients	Age	Marital status	Previous hetero-sexual intercourse	Previous homo-sexual relations	Kinsey rating KR	Kinsey rating N	Number legally charged for homosexual relations	Number in which legal charge associated with referral
1	40	17 to 56 Median 27	10 married	17	39	6 5 4 3 2 1	16 15 8 1 0 0	18 (8 repeated)	6
2	40	18 to 53 Median 25	7 married	22	37	6 5 4 3 2 1	4 25 10 0 1 0	13 (9 repeated)	8
3	46	15 to 59 Median 25	6 married 1 separated	23	40	6 5 4 3 2 1	8 8 19 5 5 1	21 (13 repeated)	6
4	31	15 to 45 Median 23	4 married 1 separated 1 divorced	19	28	6 5 4 3 2 1	6 6 10 6 3 0	3 (2 repeated)	1

The increased number of patients with heterosexual Kinsey ratings in the later studies does not necessarily reflect a change in the type of patients treated. It is due at least in part to a change in the method of rating. The Kinsey scale does not indicate the weight that should be placed on the patient's report of his amount of sexual interest in men and women as opposed to his sexual behaviour. In determining the patients' Kinsey ratings, in the earlier studies more weight was put on their statements concerning amount of sexual interest. In the later studies more emphasis was put on the patients' reported sexual behaviour. There was a reduction in the number of patients legally charged with homosexual behaviour in Study 4 as compared with the three earlier studies.

RESULTS

Reported change in sexual feelings and behaviour following treatment

Heterosexual feeling. With all forms of treatment about a quarter of the patients reported a definite increase in heterosexual feelings at the follow-up interviews which accompanied the film assessments both at 3 or 4 weeks and at 6 or 12 months.

Heterosexual intercourse. Somewhat less than a sixth of the patients reported an increase in the frequency of heterosexual intercourse at the 3 or 4 week follow-up interview. About a quarter reported such an increase at the 6 or 12 month follow-up. Most of these patients had experienced heterosexual intercourse before treatment.

Homosexual feeling. After all treatments employing aversive stimuli, about half the patients reported a definite reduction in homosexual feeling at the 3 or 4 week interview. After the positive conditioning of Study 4, about a quarter of the patients reported definite reduction in homosexual feelings. This response was significantly less than that to the comparison treatment in Study 4, classical aversive conditioning.

A quarter of the patients treated with aversive procedures reported a definite reduction in homosexual feeling at the 6 or 12 month follow-up. At this interview 2 of the 15 treated with positive conditioning reported this response.

Homosexual behaviour. At the 3 or 4 week interview three-quarters of the patients reported that they had had no homosexual physical encounters since treatment.

At the 6 or 12 month interview, of the patients who received aversive therapies half reported a reduced number of homosexual physical encounters and a quarter reported no such encounters since receiving treatment.

At this follow-up three of the fifteen patients in Study 4 who received positive conditioning reported reduction in the frequency of homosexual physical encounters. Nine of the sixteen patients who received the comparison aversive therapy reported this response. This difference is statistically significant. (Exact Test.)

These results are reported in more detail in the publications referred to above.

Change in penile volume responses following treatment

Patients' U-scores are reported in Table II. These scores are derived from the patients' penile volume responses to the pictures of nude women and men in the film assessments before and 3 or 4 weeks after treatment. In all studies the patients' U-scores at the assessment at 6 or 12 months were not significantly different from those at 3 or 4 weeks after treatment (Wilcoxin test for paired replicates). The scores at the 6 or 12 months assessment are not reported. For ease of comparison the U-scores are presented in category form. U-scores of 50 or less indicate a homosexual orientation, and 50·5 or more a heterosexual one; scores of 23 or less and 77 or more indicate that the difference in the responses to the pictures of men and women were statistically significant (two-tailed).

In all studies, the U-scores of patients at the post-treatment assessment were significantly greater than those at the pre-treatment assessment (Wilcoxin test). In Study 4 this was true for patients receiving aversive treatment and for those receiving positive conditioning. There was no significant difference between the change of U-score with treatment in the patients in these two groups.

Evidence of conditioning with positive conditioning treatment

The positive conditioning procedure was administered to 8 patients in a forward conditioning paradigm and to 7 in a backward conditioning paradigm. The patients' penile volume responses were recorded throughout the procedure. There was no evidence of conditioned penile volume increases occurring to the still pictures of the nude women with either paradigm.

Discussion

Efficacy of postitive conditioning procedure

Patients who received positive conditioning reported no greater increase in heterosexual feelings or behaviour than did those who received aversive conditioning. After aversive therapy patients do not show augmentation of penile volume increases to pictures of nude women. It has been argued that the increase in heterosexual feelings and behaviour reported by patients after aversive therapy is not a specific treatment effect (McConaghy *et al*, 1972, 1973). If this is correct the increase of heterosexual feelings and behaviour reported by patients after positive conditioning was a placebo effect, not a specific effect of the treatment. This is compatible with the finding that the positive conditioning procedure produced no conditioned penile volume increases to the slides of nude women. On the basis of present knowledge, without such evidence of conditioning of sexual arousal to heterosexual stimuli, it would not seem possible for the positive conditioning procedure to produce a specific increase in heterosexual feelings and behaviour in the patients treated.

The reduction in homosexual feelings and behaviour reported by patients after positive conditioning was significantly less than that reported after aversive therapy. There is no reason to believe that positive conditioning could have produced a reduction in homosexual feelings and behaviour as a specific treatment effect. The reduction reported was presumably a placebo effect. It would seem

TABLE II

Numbers of homosexual patients, grouped according to their U scores before and after treatment

Assessment	0–23	23·5–50	50·5–76·5	77–100	Total
Study I					
Before treatment					
Immediate Treatment Group ..	9	4	5	0	18
Delayed Treatment Group					
1st assessment	6	6	4	1	17
2nd assessment	5	7	4	1	17
Total .. .. (Immediate Treatment Group + Delayed Treatment Group 1st assessment)	15 (43%)	10 (29%)	9 (25%)	1 (3%)	35
3 weeks after treatment					
Immediate Treatment Group					
2nd assessment	5	6	7		18
Delayed Treatment Group					
3rd assessment	2	7	6	2	17
Total	7 (20%)	13 (37%)	13 (37%)	2 (6%)	35
Study II					
Before treatment					
Immediate Treatment Group ..	14	1	3	2	20
Delayed Treatment Group					
1st assessment	12	2	4	1	19
2nd assessment	9	7	2	1	19
Total .. .. (Immediate Treatment Group + Delayed Treatment Group 1st assessment)	26 (66%)	3 (8%)	7 (18%)	3 (8%)	39
3 weeks after treatment					
Immediate Treatment Group					
2nd assessment	7	6	2	5	20
Delayed Treatment Group					
3rd assessment	6	7	3	3	19
Total	13 (33%)	13 (33%)	5 (13%)	8 (21%)	39
Study III					
Before treatment					
Classical forward	7	4	2	3	16
+classical backward	7	5	2	0	14
+avoidance	9	4	1	1	15
Total	23 (51%)	13 (29%)	5 (11%)	4 (9%)	45
4 weeks after treatment					
Classical forward	5	3	5	3	16
+classical backward	6	4	2	2	14
+avoidance	7	5	2	1	15
Total	18 (40%)	12 (27%)	9 (20%)	6 (14%)	45
Study IV					
Before treatment					
Aversive procedure	8	6	2	0	16
Positive conditioning	9	4	1	1	15
Total	17 (55%)	10 (32%)	3 (10%)	1 (3%)	31
4 weeks after treatment					
Aversive procedure	4	7	4	1	16
Positive conditioning	4	6	3	2	15
Total	8 (26%)	13 (42%)	7 (23%)	3 (10%)	31

that positive conditioning as used in Study 4 acted as a placebo therapy.

Efficacy of aversive therapy

In the first three studies in which patients were randomly allocated to receive various forms of aversive therapy, following treatment they reported comparable reduction in the strength of homosexual feelings and in amount of homosexual behaviour. In Study 4, in which an aversive procedure was compared with a non-aversive procedure, positive conditioning, the reduction in homosexual feelings and behaviour reported by the patients was significantly greater after aversive therapy than after positive conditioning. Birk *et al* (1971) reported significantly greater reduction in homosexual feelings and behaviour in patients treated with aversive therapy than in those treated with a presumably ineffective control conditioning procedure not employing aversive stimuli. It would appear that aversive therapy reduces the intensity of homosexual drive.

Change in measured sexual orientation with treatment

The patients' sexual orientation as measured by the U-scores in the film assessment changed in the heterosexual direction to a statistically significant extent after all treatments. In the first two studies there was a significant relationship between change in U-score and reduction of homosexual feeling reported by the patient. It was concluded that the change in U-score indicated a shift in the patients' sexual orientation in the heterosexual direction. In the third study the relationship between change in U-score and reduction in homosexual feeling was present, but not to a statistically significant extent. In the fourth study the relationship was not present either in the patients who received aversive therapy or in those who received positive conditioning. The most likely explanation is that the significant relationship in Studies 1 and 2 was a false positive or Type I error.

The change in patients' U-scores in the heterosexual direction was as great after the positive conditioning procedure in Study 4 as after the aversive procedure. Significantly more patients reported reduced homosexual feelings and behaviour after the aversive procedure. Either this change in feelings and behaviour is not accompanied by a comparable change in sexual orientation or the U-scores from the film assessment after treatment do not provide a valid index of sexual orientation.

Validity of measure of sexual orientation

In Table III are given U-scores for pre-treatment and post-treatment assessment for the patients in Study 4 and for 18 patients treated with aversive therapy for sexual deviations other than homosexuality.

The U-scores following treatment significantly discriminate the two groups of patients, indicating that the U-scores provide a valid index of sexual orientation. It would therefore appear that the significant change in reduction in homosexual feelings and behaviour after aversive therapy, as compared with positive conditioning, is not accompanied by change in the sexual orientation of the patients.

Significance of the change in U-scores following treatment

What significance can be attached to the change in U-score that followed all treatments in the four studies? It is not great. In all

TABLE III

U-scores of homosexual patients in study 4, and non-homosexual patients, before and after aversive treatment

	0–23	23·5–50	50–76·5	77–100	Total
Before treatment					
Homosexuals	17	10	3	1	31
Non-homosexuals	0	0	5 (28%)	13 (72%)	18
	$\chi^2 = 27{\cdot}0$ (df = 3, P < ·001)				
After treatment					
Homosexuals	8	13	7	3	31
Non-homosexuals	0	1 (5%)	3 (17%)	14 (78%)	18
	$\chi^2 = 22{\cdot}42$ (df = 3, P < ·001)				

studies over half the patients continued to obtain a U-score indicating a homosexual orientation after treatment. However, the change has consistently been in the heterosexual direction and reached statistical significance. The change was just as strong after the positive conditioning procedure in Study 4, so it would appear to have occurred although the treatment employed was ineffective in changing the patients' sexual feelings. The change is apparently not due to the fact that the scores are derived from the patients' responses when they are viewing the film for the second time. In the first two studies no such change occurred in patients in the delayed treatment groups who watched the film on two occasions before receiving treatment. No significant change occurred in the U-scores of the non-homosexual patients on their second film assessment after treatment.

Evidence has been advanced by Laws and Rubin (1969) that men have some degree of voluntary control over changes in penile dimensions. These workers, using a mercury strain gauge as a transducer, reported changes in penile circumference in 4 of 7 volunteers who watched an erotic moving film of ten minutes duration. When instructed to attempt to prevent erection the subjects were able to reduce the average degree of erection to 14 per cent of the maximum from 76 per cent of the maximum without this instruction. They were able to produce partial erections of 13 per cent of the maximum when instructed to do so in the absence of the erotic film. The shortest latency of any increase in penile size under these conditions was slightly less than one minute.

It has been pointed out that changes in penile circumference as measured by a strain gauge may vary considerably from penile volume changes measured by plethysmography (McConaghy, 1974). Nevertheless, Laws and Rubins' results suggest that homosexual patients may be able to reduce their penile volume responses to pictures of nude men to some extent. With the film assessment procedure used in the present study the patients' responses are measured for ten seconds. It is unlikely that the patients could produce any penile volume increase to the pictures of the nude women within this time, as it is well within the latency reported by Laws and Rubin. The relatively small changes in penile volume responses which occurred in homosexual patients after treatment were significant reductions in penile volume responses to the pictures of nude men. No penile volume increases to the pictures of nude women occurred.

It is not suggested that the patients produce these changes consciously but that their motivation to show improvement with treatment may cause them to do so unconsciously.

Significance of the reduction in homosexual feelings and behaviour following aversive therapy

Significantly greater reduction in homosexual feeling and behaviour followed an aversive as compared with a non-aversive procedure both in Study 4 and in the study reported by Birk *et al* (1971). How can this therapeutic response occur without a comparable change in a valid objective measure of sexual orientation? With the data at present available, the possibility cannot be excluded that the therapeutic response is due to suggestion and is not a specific effect of treatment. It has been argued that this is unlikely (McConaghy, 1975). A mode of action for aversive therapy has been suggested (McConaghy, 1969) which is compatible with a specific treatment response without change in sexual orientation. It is that the alternation of excitatory (homosexual) and inhibitory (aversive) stimuli which occurs in aversive therapy sets up the condition Pavlov (1927) described as a focal experimental neurosis. In an experimental neurosis previously learned associations disappear.

After aversive therapy for homosexuality patients report less preoccupation with homosexual thoughts and a weakening of compulsions to become involved in homosexual activity. In the past these compulsions were activated when the patients passed locations, such as lavatories or parks, where they had regularly carried out such activity. Presumably these locations became stimuli for homosexual arousal by association with homosexual gratification. If these situations lost their secondary reinforcing properties they would no longer provoke

homosexual thoughts and arousal. This would occur with the disappearance of learned associations which follows an experimental neurosis. If all stimuli built up over years of homosexual experience lost their secondary reinforcing properties in this way, patients could experience this as a weakening of homosexual feelings and interest, although their sexual orientation remained unchanged.

Can treatment alter homosexual orientation?

The aversive therapies investigated in the four studies reported would appear not to have altered the patients' sexual orientation. No evidence is yet available which indicates that other treatments are more effective in reducing homosexual and increasing heterosexual behaviour than the aversive therapies investigated (McConaghy, 1969, 1972). There is no evidence that other treatments achieve their effect by changing the sexual orientation of homosexual patients.

A physiological index of sexual arousal is available which discriminates homosexual from heterosexual men. In the fourth study reported, this index discriminated homosexual patients who had received treatment from heterosexual subjects. It failed to discriminate homosexual patients who received an effective treatment from those who received a significantly less effective one. Before it can be accepted that a treatment for homosexuality has changed the patients' sexual orientation it would be necessary to show either that this physiological index discriminated effectively treated homosexuals from homosexuals who received a significantly less effective control procedure; or that the index failed to discriminate a substantial proportion of effectively treated homosexuals from heterosexuals. Until such evidence is produced it must be assumed that present treatments may reduce or eliminate patients' homosexual behaviour and awareness of homosexual feeling without altering their sexual orientation.

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