

# THE APPLICATION OF ANTICIPATORY AVOIDANCE LEARNING TO THE TREATMENT OF HOMOSEXUALITY

## 1. THEORY, TECHNIQUE AND PRELIMINARY RESULTS

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**Summary**—It is argued that previous techniques of aversion therapy have paid too little attention to the general body of learning theory, and a summary is given of the relevant variables. It is pointed out that anticipatory avoidance learning appears to be the training method most resistant to extinction, and a full description is given of a technique designed to enable its clinical application to the treatment of homosexuality. Some preliminary results of treatment are described, and it is concluded that the technique is most promising. Further studies are in progress.

### 1. INTRODUCTION

FOR some years therapists have attempted to treat alcoholism and sexual aberrations by associating the noxious properties of apomorphine with the ingestion of alcohol. The usual theoretical basis given for this is in terms of Pavlovian conditioning, with alcohol as the CS and the nausea induced by the drug as the UCS. As Franks (1960) and others have pointed out, the effectiveness of Pavlovian conditioning depends partially on the correct temporal relationship of the CS and the UCS being observed. Control over such relationships is very difficult when apomorphine is used, hence it has been suggested that some form of electric shock be employed as the UCS. This suggestion has been taken up very recently by several workers and applied to the treatment of sexual aberrations, e.g. Blakemore *et al.* (1963), McGuire and Vallance (1964).

A full review of the literature up to 1961 concerning the treatment of sexual aberrations by behaviour therapy was given by Rachman (1961). The techniques used both up to and since that time appear to have attempted either to increase avoidance of the undesirable sexual object, or to reduce the strength of the approach towards it. The latter approach has usually utilized some variety of Wolpe's desensitization technique, e.g. Bond and Hutchinson (1960), Stevenson and Wolpe (1960). Much the largest series to date is that of Freund (1960), who used apomorphine with homosexuals, and attempted to combine the aversion produced by vomiting with an increase in the strength of approach to females, supposedly produced by testosterone propionate. A similar attempt has been made by James (1962) on a single case. In few of the published reports to date has there been a clear cut description of exactly what was done in terms of the various learning variables involved, nor any attempt to give a detailed theoretical explanation of the technique used. These faults are particularly marked in two recent examples, namely Cooper (1963) and Clark (1963), both of whom treated fetishisms with apomorphine-induced vomiting. What appears to be required is a systematic attempt to design a technique which will make use of the knowledge derived from the many thousands of experiments on animal and human learning which appear in the literature, e.g.

Kimble (1961), and to describe the technique in such a precise way that it can be readily reproduced by others.

With these considerations in mind, we decided, before embarking on the treatment of homosexuality, to make a thorough search of the literature concerning avoidance training. We also hoped to replace the undesired sexual behaviour by a more socially acceptable kind, so that it was necessary to design the technique to include the reduction of the gradient of avoidance to females.

## 2. VARIABLES RELEVANT TO AVOIDANCE CONDITIONING

### (a) *The major techniques of avoidance conditioning*

A most useful review of the various techniques of avoidance conditioning has been given by Solomon and Brush (1956). Very briefly the main ones are as follows:

1. Classical Pavlovian Conditioning. The CS and the UCS are repeatedly paired, regardless of the subject's behaviour. The UCS is only omitted on certain test trials. This technique results in unstable learning, and easy extinction.
2. Escape training. The CS and the UCS are presented together, and are terminated together by the subject. This is therefore a variety of instrumental learning. Extinction is very easy to obtain with this technique (Sheffield, 1948).
3. Prior Anxiety Conditioning. The CS-UCS pair is repeated, regardless of the subject's behaviour. The subject is then allowed to terminate the CS by making a specific response with the UCS not presented. This results in poor learning, and easy extinction (Miller, 1948).
4. Simple punishment. Some noxious stimulus occurs, following the occurrence of the CS, if the subject performs the undesirable approach response. Extinction is particularly easy with this technique (Estes, 1944).
5. Temporal Pairing. The UCS (shock) is administered at regular intervals if the subject fails to make the appropriate instrumental avoidance response, e.g. operating a lever. If he does so, the UCS is delayed. This results in successful learning and good resistance to extinction (Sidman, 1962), but is difficult to combine with the reduction of avoidance to the alternative stimulus (in the case of homosexuals, women).
6. Anticipatory Avoidance Learning. This has been mainly described by Solomon and his colleagues. The CS is presented several seconds before the UCS, and serves as a signal that the UCS is about to occur. The instrumental response of the subject, which terminates the CS, prevents the occurrence of the UCS, e.g. Solomon *et al.* (1953). This technique produces reasonably good acquisition, and very high resistance to extinction.

Resistance to extinction is particularly important in this context, as Eysenck (1963) has pointed out. It is not particularly relevant whether it takes 10 sessions or 30 sessions to alter the direction of a homosexual's interests; what is vital is that, once established, the new pattern should persist for as long as possible. Kimble (1961) has pointed out that the explanation of resistance to extinction is largely related to the conditions of acquisition of the response concerned. Hence it is necessary to use the training technique which shows itself to be most resistant to extinction. Solomon, Kamin and Wynne (1953) experienced very great difficulty in extinguishing the avoidance responses of their dogs, whom they had trained to avoid shock by jumping into another cage at the sound of a buzzer, and had to introduce very special and unusual techniques in order to do so.

*(b) Learning variable affecting the resistance to extinction of an avoidance response*

In view of the above, it was decided to design a technique which would attempt to reproduce that used by Solomon and his colleagues. It was also decided to build into this technique all the variables which have been shown to increase resistance to extinction. The technique falls, of course, under the general heading of instrumental conditioning, so that the patient has to make an operant response rather than being the passive recipient of stimuli, as in classical conditioning.

1. *Inter stimulus interval.* The too frequent occurrence of unspaced training trials might be expected to lead to reactive inhibition, and hence to the possibly permanent decrement of the avoidance response (Feldman, 1963). Trials should therefore be distributed rather than massed.

2. *The intensity of the UCS.* Kimble (1955) showed that avoidance response time shortened as shock increased, up to an asymptote, beyond which increasing the shock had no further effect. From this it can be deduced that there is little point in bombarding the patient with very high levels of shock. All that is required is one sufficiently intense for him to find it more unpleasant than he finds the CS (e.g. a male stimulus) to be pleasant.

3. *CS-UCS interval.* Solomon and Brush (1956), discussing the result of their technique of avoidance training, concluded that it is particularly important that contiguity should occur throughout. That is, the performance of the instrumental avoidance response should be contiguous with CS offset, and on those trials on which the subject fails to perform the avoidance response and hence receives a shock, the offset of the shock and of the CS should both occur contiguously with the eventual performance of the avoidance response. They further concluded that the importance of the shock was not the length of its duration, but the fact of its occurrence.

4. *Mode of introduction of shock.* Miller (1960) has demonstrated that gradually increasing the strength of the shock enabled successful habituation to high level shocks, and resulted in less avoidance learning in rats, than when they immediately received a high level shock, with no gradual habituation. From personal discussions with several psychologists working in this field, it seems that quite often patients are subjected to gradually increasing shocks, so that they have the opportunity of habituating to them.

5. *Perceptual salience.* It is a general rule that learning is most effective when the CS stands out clearly from the visual and auditory background. Hence avoidance training should as far as possible be carried out in rooms which are darkened and sound proofed.

6. *Partial reinforcement.* Humphreys (1939) demonstrated that a random alternation of reinforcement and non-reinforcement in eyelid conditioning led to a very considerably increased resistance to extinction. This fact has been demonstrated on many occasions since. Whatever the explanation of the finding, (Lewis, 1960), the fact of its occurrence is undoubted. In an instrumental avoidance training situation, this implies that some attempts to avoid should succeed (reinforcement) and others should fail (non-reinforcement). That is, on the latter type of trial, despite making the avoidance response, the patient should be shocked. Reinforced and non-reinforced trials should be alternated randomly.

7. *Delay of reinforcement.* There is much data on the effect of delay of positive reinforcement on the acquisition and resistance to extinction of an approach response. As summarized by Renner (1964), the results suggest that while constant delay will retard acquisition and may retard resistance to extinction, variable delay may or may not retard acquisition but will lead to considerably increased resistance to extinction. Further, variable

delay is essentially the same phenomenon as partial reinforcement. Unfortunately, there is comparatively little data on the effect of delay of negative reinforcement (e.g. shock) on the acquisition and resistance to extinction of an avoidance response. However, Crum *et al.* (1951) have demonstrated that varied delay of punishment leads to greater resistance to extinction than immediate punishment.

The work discussed above is concerned with learning situations in which the criterion response is emitted only once, such as a rat crossing a runway. In an aversion therapy situation, the criterion (avoidance) response might well be that of a patient pressing a switch to remove a picture (the CS) which has acquired noxious qualities through association with shock. In this case therefore the avoidance response is such that it could easily be performed several times within a few seconds. The delay would thus consist of the failure of the picture to leave the screen immediately the patient operates the switch. Work by Amsel and his colleagues (Amsel, 1958 and Amsel and Roussel, 1952) on frustration theory suggests that what is being delayed is the confirmation, by removal of the picture, that the patient's performance of the avoidance response has had the desired effect of avoiding shock. It seems therefore that the effect of randomly varying the delay time (that is the interval between the appearance of the picture and the eventual removal of the picture) would be to further increase the resistance to extinction of the avoidance response.

8. *Variation during training.* McNamara and Wike (1958), Crum, Brown and Bitterman (1951) and McClelland and McGowan (1953) have shown that the greater the variation of stimulus conditions during training, the greater the resistance to extinction. The explanation for this finding appears to involve the concept of generalization decrement. That is, the more the training situation and the real life situation differ, the more rapidly will extinction occur. Hence one should try to make the training situation both as realistic as possible and as varied as possible; thus simulating real life in so far as one is ever able to do so in a therapeutic situation. It follows, for instance, that varying the interval of time between successive trials would also be expected to increase resistance to extinction, although there appears to be no direct evidence upon this point.

9. *Quantity of reinforcement.* McClelland and McGowan (1953) showed that varying the quantity of reinforcement in a random fashion also increased resistance to extinction. In the present situation, randomly varying the level of shock, administered on non-reinforced trials, would therefore be expected to have this effect.

(c) *Summary of the variables relevant to conditioned avoidance*

1. Training trials should be well spaced, so as to prevent the building up of reactive inhibition; moreover the inter-trial interval should vary randomly.
2. The CS should be presented in as clear cut a manner as possible with no distractions.
3. Shock should be used rather than apomorphine because of ease of control.
4. Reinforcement should be partial, so that some attempts to avoid are rewarded, whilst others are non-rewarded. On unrewarded trials, the subject, despite his attempts to avoid, is in fact shocked, albeit briefly.
5. On rewarded trials, the delay time (the interval between the appearance of the male photograph and its eventual removal) should vary from zero to several seconds and should do so randomly.
6. The level of shock used should vary randomly about the level described by the patient as being unpleasant. The onset of shock should be at whichever level of intensity is intended to be used for the trial concerned. This is to avoid habituation as discussed earlier.

## 3. THE PRESENT TECHNIQUE

*(a) Introduction*

A brief non-technical account of our technique of anticipatory avoidance learning as used with homosexuals, together with the treatment and nine month follow-up of our first patient, appears elsewhere (Feldman and MacCulloch, 1964). A much fuller description will now be given.

Essentially, we have made an attempt to reproduce the method used by Solomon and Wynne (1953) with dogs. They placed a dog in a cage, separated by a fence from a second cage. Several seconds after the onset of a buzzer, the dog received a shock. Leaping over the fence terminated both the buzzer and the shock. Several trials were required before the dog learned to anticipate the shock and to leap over the fence before it ensued, hence terminating the buzzer and avoiding the shock. Once established, the response showed no tendency to extinguish, and there was an all or none change between escaping and avoiding.

Very recently, Solomon (cited in Eysenck, 1964) has again been studying avoidance behaviour in dogs, but has used meat as the CS instead of a buzzer, and swatting with a rolled newspaper instead of shock as the UCS. He found that punishing the puppies just as they approached the food was more successful in setting up and maintaining the response of avoiding eating the meat than punishing them after they had begun eating. This work is extremely relevant to the conditioning of avoidance responses in homosexuals, in two senses; firstly it involves a situation in which the CS—meat—is highly attractive as compared with a buzzer which is relatively neutral; secondly despite this greater attractiveness, it was still possible to condition avoidance behaviour. Moreover, punishment early in the behaviour sequence was more effective than punishing late. The implications are that the outcome of training is the same whether the CS is neutral or attractive, and also that the proposed technique, that of anticipatory avoidance, is likely to be the most effective one in conditioning and maintaining avoidance to an attractive stimulus.

*(b) Sequence of events*

All patients go through the following procedure:

- (i) A detailed interview based on that used by Kinsey *et al.* (1947), but including additional psychiatric data.
- (ii) Each patient is offered treatment, and is told that we are trying out a new technique, so that we cannot in any sense guarantee success, but that we will do our best to help him. He is also told initially that the treatment is unpleasant, and that it involves electric shocks. To date about five out of six of those interviewed have decided to embark upon treatment. We offer all patients treatment because we do not wish to bias further the process of self-selection which inevitably has gone on, and we hope as far as possible to be able to generalize our conclusions, as to the efficacy of our treatment, to the sample of homosexuals who present themselves at psychiatric clinics.
- (iii) Once the patient has decided to enter on treatment, he is administered the Eysenck Personality Inventory (Eysenck and Eysenck, 1964). This is a development of the Maudsley Personality Inventory (Eysenck 1959), and provides measures of the personality variables of neuroticism and extraversion. If desired, separate measures of two aspects of extraversion, namely sociability and impulsiveness, can also be derived. In addition a lie score can be obtained. The patient also fills in a sexual approach-avoidance scale based on Osgood's semantic differential technique (Osgood *et al.*, 1957). The results obtained from these two scales will be reported at a later date.

- (iv) We then present the patient with a large series of slides of males both clothed and unclothed. He is asked to briefly assess these for their degree of attractiveness. A number of them are selected, and are then presented to him, using the paired comparisons technique (Woodworth and Schlosberg, 1960), in order to arrange them in a hierarchy of attractiveness. The hierarchy obtained usually comprises about eight slides, and provides as wide a range as possible of homosexual stimuli and behaviour. We start with a slide which is only mildly attractive, thus beginning at a relatively low point on the gradient of approach, so that it will be as easy as possible to set up an avoidance response. (In much the same way, of course, Wolpe and his colleagues begin to decondition a phobia by presenting a situation which evokes relatively little anxiety.) A hierarchy of female slides is set up in the same way but in the reverse order of attractiveness. That is, we begin with the most attractive, (for some patients, this is more accurately described as the least unattractive) working up to the least attractive. We have accumulated a large number of slides, some in colour and some in black and white. The pictures from which the male slides have been made have come both from magazines for the general public, and from those which appear to have been specifically designed for homosexuals. If patients have any pictures in their possession of which they are particularly fond, these are also used. The female pictures have also been taken from magazines. In the case of both male and female pictures, we have attempted to acquire a wide range of stimuli, varying from the totally clothed to the fully nude. We also use pictures which suggest various types of homosexual activity, although we have not yet used any of heterosexual activity. It has been found particularly helpful to use pictures of males and females known to the patient in real life. In one case we have been provided with pictures of a recent homosexual "affair", and in five cases we have used pictures of wives or girl friends.
- (v) We then establish that level of shock which the patient describes as very unpleasant. Shock is increased up to this point in a step-wise manner, so as to reduce the possibility of habituation.

We present slides by back projection on to a viewing box. The room is in darkness and is in a quiet corner of the department. A full description of the apparatus is given in the next section.

The patient is told that he will see a male picture, and that several seconds later he might receive a shock. He is also told that he can turn off the slide by pressing a switch, with which he is provided, whenever he wishes to do so, and that the moment the slide leaves the screen, the shock will also be turned off. Finally he is told that he will never be shocked when the screen is blank. It is made clear to him that he should leave the slide on the screen for as long as he finds it sexually attractive. The first slide is then presented. The patient has the choice of switching it off, or leaving it on the screen. Should he switch it off within eight seconds he is not shocked, and this is termed an avoidance response. Should he not switch off within eight seconds, he receives a shock. If the shock strength is not sufficiently high to cause him to switch off immediately, it is increased until he does so. In practice this has hardly ever been necessary. The moment the patient performs the switching off response, the slide is removed and the shock is terminated. This is termed an escape trial. In addition to switching off, the patient is told to say "No" as soon as he wishes the slide to be removed. It is hoped that a further increment of habit strength will accrue to the avoidance habit by means of this further avoidance response. The usual course of events is :

- (i) Several trials in all of which escape responses are made;

- (ii) A sequence of trials, in some of which the patient escapes, and on some of which he avoids.
- (iii) A sequence of trials, in which the patient avoids every time.

When he has avoided on three successive trials, we place him on a predetermined schedule of reinforcement, which has had built into it the variables which have been shown to increase resistance to extinction, as described earlier. There are three basic types of trial:

- (i) Reinforcement (R) Trials. One third of all attempts to avoid are allowed to succeed immediately.
- (ii) Non-Reinforced (NR) Trials. One third of all attempts to avoid are not allowed to succeed; that is, in spite of the patient's attempts to switch off and to say "No", he has to sit out the eight seconds, and receive a brief shock. The shock and the slide terminate simultaneously.
- (iii) Delayed (D) Trials. One third of all trials are delayed; that is for a period of time within the eight seconds period, the patient's attempts to switch off fail to succeed. He does eventually succeed before eight seconds has elapsed. The length of time for which he is delayed may be either 4, 6 or  $7\frac{1}{2}$  seconds after the onset of the slide, varied randomly.

The three types of trial, reinforced, non-reinforced and delayed, appear in random order, and the inter-trial interval is also randomly varied.

When the patient both, (i) reports that his previous attraction to the slide has been replaced by indifference or even actual dislike; and, (ii) attempts to switch off within one to two seconds of the slide appearing; we proceed to the next slide and repeat the process.

As well as attempting to increase the gradient of avoidance to male stimuli, we also attempt to decrease the gradient of avoidance to female stimuli. (Strictly speaking, we cannot attempt to make females more attractive. All we can do is to attempt to make them less unattractive.) From our own observations, as well as from considerable clinical literature, e.g. Rado (1943), it is clear that many homosexuals are not merely indifferent to females, but frequently fear sexual contact with them. Hence it is necessary to attempt to reduce this anxiety. In order to do so, we used observations made during pilot experiments on members of our staff, and using neutral slides as the CS. When the pilot subjects were regularly performing avoidance responses, they reported experiencing considerable relief when the slide left the screen. Our patients have also reported this in the clinical situation. We therefore make the introduction of the female slide contiguous with the removal of the male slide. That is, we attempt to associate relief of anxiety with the introduction of the female. However a female slide is not introduced at every trial, thereby preserving the principle of attempting to reduce generalization decrement. Moreover we allow the patient to request the return of the female slide after it has been removed. (The female slide is always removed by the therapist and not by the patient, so that his habit of avoiding females is not strengthened in the training situation.) When wishing to request the return of the female slide, he is told to do so by clicking a switch and by saying "Yes" immediately after the female slide has been removed. The situation is such that the absence of a female slide means that a male slide, by now associated with shock and hence anxiety-provoking, may reappear. Hence the patient gradually becomes motivated to request the return of the female slide. However, this request is met in an entirely random manner, sometimes being granted and sometimes not, so that the patient cannot predict what will be the consequences of his attempting to switch off the male slide, nor of his asking for the return of the female

slide. The whole situation is designed to lead to the acquisition of two responses; firstly, attempts to avoid males, and secondly attempts to approach females.

We begin by pairing the least attractive male picture with the most attractive (or least unattractive) female picture, and proceed to the next female picture when the patient is regularly requesting the return of the first one. As has been explained earlier, we proceed to the next male slide when the patient is both regularly and quickly rejecting the first one. The object of pairing slides in this way is of course to reduce as far as possible the disparity between the degree of attractiveness of the male and female picture, thus making easier the increasing of avoidance to males and the reduction of avoidance to females.

TABLE 1. PROGRAMME FOR AVOIDANCE TRAINING

Trial	Type	Shock Intensity	Delay time (sec)	Time to next stimulus (sec)
1	D		4½	20
2	R <sub>F</sub>			
3	D <sub>FF</sub>		6	
4	R			25
5	NR			15
6	D		4½	35
7	D		4½	25
8	NR <sub>FF</sub>	DOWN		
9	NR	UP		30
10	R <sub>F</sub>			
11	D <sub>FF</sub>		7½	
12	R			25
13	NR <sub>FF</sub>	DOWN		
14	R			25
15	R			15
16	D <sub>F</sub>		6	
17	D <sub>FF</sub>		7½	
18	NR	UP		15
19	D		6	35
20	R <sub>FF</sub>			
21	NR	SAME		30
22	R <sub>F</sub>			
23	NR	UP		30
24	NR	DOWN		15
25	D <sub>FF</sub>		6	

Start at any point in the programme. Then proceed in circular manner, e.g. start at trial 6, proceed to 25, restart at trial 1.

Key: R = Reinforced  
 NR = Non Reinforced  
 D = Delayed  
 F = Female  
 FF = Female reappears if requested

Our schedule of reinforcement is shown in Table 1. This is rigidly adhered to, and in order to avoid the subject learning the schedule and thus being able to anticipate the nature of the next trial, we start at different points in the sequence for each session. About 30 trials per session are given, and each session lasts about 20 minutes. In-patients receive two sessions of treatment per day. With out-patients the length of time between sessions varies according to the patient's own convenience. The number of treatment sessions has varied



from 5 to 28, with the average being about 15. We continue treatment until either a change of interest occurs, or it becomes clear that no change is likely. All patients are followed up at increasing intervals of time, and "booster" sessions are given, particularly for the first few months after the completion of treatment. On average a patient will be seen about 8 to 10 times during the year following completion of treatment.

#### 4. APPARATUS

##### (a) *Slide presentation*

The patient sits in a wooden armchair. Six feet in front of him there is a ground glass screen, 3'6"  $\times$  2'6", whose centre is at eye level. The screen forms one end of a viewing box whose sides taper as they approach the patient's face, to form an oblong apex 12" tall  $\times$  9" broad. The patient sits with his face just inside this, and the interior surface has a semi circle cut out to accommodate his neck. The apparatus is lined with matt black paper.

The slides are projected from an Aldis, magazine loaded, semi-automatic projector. It was found desirable to run the projector so that the patient could not directly see the light source. This was achieved by projecting from a low position, so that the lens of the projector was below the level of the bottom rim of the glass screen. A diagrammatic sketch of the whole set-up is shown in Fig. 1. In order that, theoretically at any rate, the patient's only

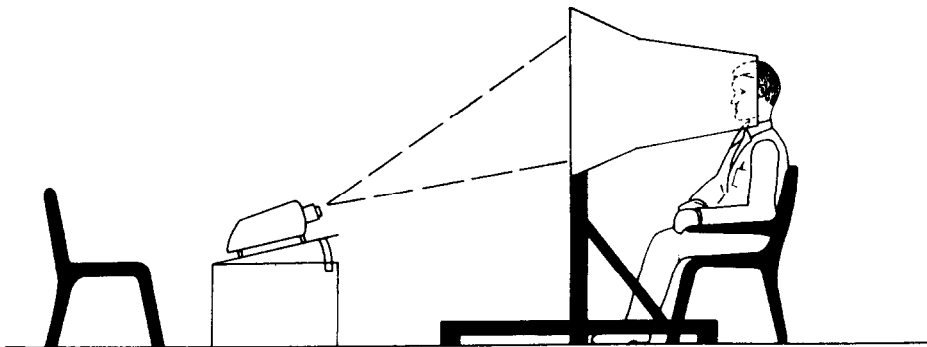


FIG. 1. Sketch plan of the projector, viewing box, and patient. Not shown are the therapist, the electrical apparatus and leads, and the patient's stimulus control switch.

sensory input should be visual, he is provided with ear muffs manufactured by one of us (MJM). The ear muffs are attached to a perspex head band, and consist of two cloth covered sponge-foam ear pads, of 3 in. diameter. They were subjectively found to markedly reduce auditory acuity when used upon ourselves and our patients.

##### (b) *The electrical stimulus*

It was decided to use a battery-run induction coil for presenting the electrical stimulus, (i.e. the UCS). Apart from the fact that it is psychologically sounder, electrical stimulation was also felt to be physiologically safer than chemical methods such as apomorphine. The batteries have a low capacitance, so that the chance of a serious mishap is very small.

The electrical stimulus is derived from a self oscillatory induction coil with vibrating contact similar in type to those on the market for entertainment purposes. The unit is battery driven and consists of a magnetic/mechanical make-break circuit as used in an electrical buzzer. The current passes from the battery to the contacts adjacent to the magnetic core, and then through the primary winding of the induction coil back to the battery. The time integral of the induction coil is such that when the contacts open due to the magnetic

attraction of the core, a high peak back e.m.f. is produced, into what is in effect an exceedingly high resistance on open circuit. It is this pulse to which the patient is subjected.

The primary is fed from an 18 V multi tap battery, and there are two switches in this circuit. The first closes the circuit, the second enables the battery to be tapped for pre-selected voltages. It was found that some patients' shock threshold was so high that 18 V primary potential was sometimes required. The secondary circuit is connected to the patient via two nickel electrodes,  $1\frac{1}{2}$  in. in diameter, cloth covered, and always soaked in saline. It was considered important to standardize the "sweat resistance" by adding physiological saline to the pads. In this way the patient's resistance is kept constant at successive sessions. The saline, although subject to an electrophoretic effect, is not dangerous. The application of naked electrodes could result in the tattooing of nickel into the skin, and for a similar reason, electrode jelly was avoided. The electrodes are placed over the posterior tibial group of muscles, avoiding the tibia and the lateral peroneal nerve. The positive and negative electrodes are randomly interchanged from right to left, and both legs are used randomly. It is thus impossible for the patient to habituate to set electrode positioning. Because of the cloth covers over the electrodes, sufficient saline is retained throughout the session to obviate drying for up to about 30 minutes. Both electrodes are applied to the same limb, thus avoiding current flow through the body itself.

The strength of the current applied is varied by the operator via a variable resistor. An alternative circuit is provided, so that a fresh pre-set stimulus can be introduced in accordance with the previous theoretical discussion. On the final circuit to the patient there is a cut out switch, which is operated by the patient. When he uses this switch the CS is always switched off. The cut out switch is "mastered" by a control switch on the therapist's control panel, so that on some occasions, as described earlier, the patient's attempt to remove the CS is delayed. A diagram of the electrical circuit is provided in Fig. 2. The intervals between slide presentations and the durations of CS presentation are measured by a stop watch.

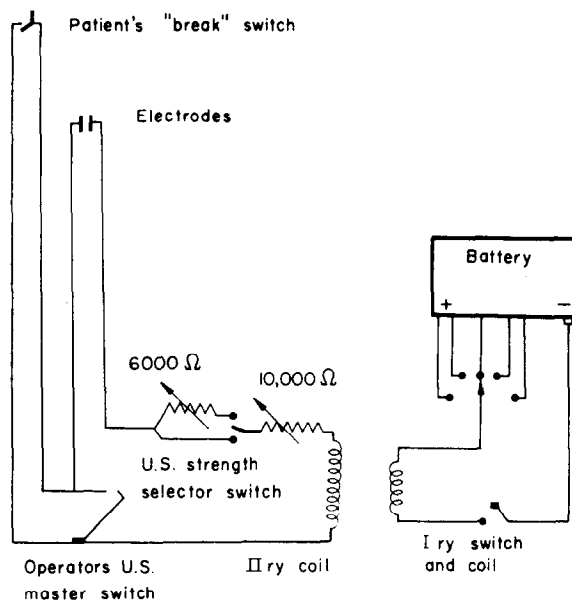


FIG. 2. Diagram of the electrical circuits used in the treatment of homosexuality by anticipatory avoidance learning.

## 5. DISCUSSION

*(a) The results of treatment to date*

In later papers we will report data dealing with avoidance response latencies, conditioned heart rate changes, and attitude studies. A full clinical description of the sample and the results of treatment will also be given, when we have completed a larger number of patients than at present, and an adequate follow up period has been allowed.

At the present stage, we shall give only a very brief account of the patients treated to date and the preliminary results. We have attempted to guard against being too optimistic and against suggesting to the patient the outcome which will occur. *We offer treatment to all patients*, a procedure which is somewhat unusual for this field, as most therapists select their patients very carefully. However, we wish to be able to predict the patients for whom our technique will be suitable. We will only be able to do so if we take all who offer themselves for treatment, and then try to discover relationships between the outcome of the treatment, and the various factors recorded in our initial interview and attitude measurements. Our criteria for accepting the occurrence of change are severe, and we attempt to prove patients' claims to be false rather than accepting them at face value.

We have so far commenced the treatment of 19 patients displaying homosexual behaviour. Three patients out of the 19 have failed to complete their course of treatment. In all three cases they have broken off treatment after only one or two sessions; one because he was made very anxious by the whole procedure; one, who was referred by the Courts, found after two sessions that he was actually enjoying the treatment, and decided that in any event he did not really want to change; and one, who was also referred by the Courts, asked after the first session for further treatment to be carried out under an anaesthetic!

Brief details concerning the pre-treatment status, the results of treatment, and follow-up status of the remaining 16 patients are set out briefly in Table 2.



TABLE 2.—CONTINUED

1	2	3	4	5	6		7		8		9		10		11		12		13		14		15
					Age of referral	Martial status	Mode of referral	K.R.	Pre-treatment practice	Pre-treatment practice	Immediate post-treatment	Immediate post-treatment	Follow-up trend	Follow-up trend	K.R.	Present status	Present status	Length of follow-up					
5	28	S	1	6	<p>Het.</p> <p>Nil interest, fantasy or practice on referral. At age 20, 1 month affair with S.I.</p>	<p>Hom.</p> <p>M.M. 12 yrs. B. 2 years. Strong interest. Several "affairs".</p>	<p>Het.</p> <p>Increased interest and fantasy. Nil practice.</p>	<p>Hom.</p> <p>Nil interest, fantasy or practice.</p>	<p>Het.</p> <p>Strong interest and fantasy. Social mixing.</p>	<p>Hom.</p> <p>As in col. 9</p>	<p>0</p>	<p>Het.</p> <p>Girl friend petting and very strong interest.</p>	<p>As in col. 9</p>	<p>6 mths.</p>									
6	26	M (1 yr)	3	5	<p>No S.I. with wife since honeymoon. Little interest in wife. Nil in other women. Nil fantasy.</p>	<p>Strong interest in boys aged 12-16 for 8 years. Strong fantasy. Assault on pupil led to court case. Nil previous practice.</p>	<p>As in col. 6. i.e. no change after treatment.</p>	<p>Nil interest, fantasy or practice</p>	<p>Increased interest in wife. Petting. No S.I.</p>	<p>As in col. 9</p>	<p>0</p>	<p>As in col. 10</p>	<p>As in col. 9</p>	<p>3 mths.</p>									
7	24	S	1	6	<p>Nil interest or fantasy. Aged 16 one date. Nil practice.</p>	<p>Strong interest and fantasy for 8 years. M.M. 5 years. Few partners.</p>	<p>Increased interest and fantasy. Nil practice.</p>	<p>Very slight interest. Nil fantasy or practice.</p>	<p>Increased interest. Strong fantasy, Girl friend. Kissing.</p>	<p>As in col. 9</p>	<p>1</p>	<p>As in col. 10</p>	<p>As in col. 9</p>	<p>2 mths.</p>									
8	28	S	3	3	<p>Strong interest and fantasy S.I. aged 16. Nil practice except social mixing since.</p>	<p>M.M. and B. 1 year following minor head injury. 5 partners. Strong interest and fantasy.</p>	<p>As in col. 6 i.e. no change</p>	<p>Nil fantasy, interest or practice.</p>	<p>As in col. 6</p>	<p>As in col. 9</p>	<p>0</p>	<p>As in col. 6</p>	<p>As in col. 9</p>	<p>2 mths.</p>									

TABLE 2.—CONTINUED

1	2	3	4	5	6		7		8		9		10		11		12	13		14	15
					Pre-treatment practice		Immediate post-treatment		Follow-up trend		Present status		Length of follow-up								
No.	Age on referral	Marital status	Mode of referral	K.R.	Het.	Hom.	Het.	Hom.	Het.	Hom.	Het.	K.R.	Het.	Hom.	Present status	Length of follow-up					
9	28	S	2	5	Several girl friends, pre age 24. No S.I. On referral slight interest Nil fantasy or practice.	M.M. 12 yrs. B. 5 years. Very strong interest and fantasy. Many partners	Increased interest and fantasy. Nil practice.	As in col. 7. i.e. no change after first course of treatment.	Six months post treatment met girl. Strong non sexual attachment.	Two part-ners (M.M.) Strong interest and fantasy. Decided to have second course of treatment, outcome below.	Engaged. Very strong interest Practice un-changed.	0	Het.	Hom.	Het.	Hom.	2 mths.				
10	31	M (5 yr)	1	3	Several girl friends. No S.I. pre marriage. Some S.I. in marriage. wife more satisfied than patient. Some interest and fantasy.	M.M. 14 yrs. Many partners. Strong interest and fantasy.	More successful S.I. with wife. Strong interest and fantasy generally.	Nil interest, fantasy or practice.	As in col. 8	As in col. 8	As in col. 9	0	As in col. 8	As in col. 9	As in col. 8	As in col. 9	1 mth.				

TABLE 2.—CONTINUED

1	2	3	4	5	6		7	8		9	10	11	12	13		14	15
					Pre-treatment	Practice		Immediate post-treatment	Follow-up trend					Present status	Length of follow-up		
No.	Age on referral	Marital status	Mode of referral	K.R.	Het.	Hom.	Practice	Het.	Hom.	Hom.	Het.	Hom.	K.R.	Het.	Hom.	Length of follow-up	
11	35	S	2	5	Two girl friends pre age 26. Petting, no S.I. Since then nil practice or fantasy. Some interest.	M.M. 15 yrs. B. 12 years. Strong interest and fantasy. Many partners.	Strong interest and fantasy. "Picked up" girls at dances Petting to climax.	Strong interest and fantasy. "Picked up" girls at dances Petting to climax.	Hom.	Declining interest, fantasy and practice.	Increasing fantasy and interest.	75	Three months past treatment ceased attending. Wrote that did not wish to come again. Presumed to have relapsed completely.				
12	19	S	1	6	Nil interest, fantasy or practice ever.	M.M. 7 yrs. B. 4 years. Many partners. Strong interest and fantasy.	As in col. 6 i.e. no change after treatment.	As in col. 6 i.e. no change after treatment.	Hom.	Nil interest or fantasy. Dates with several girls, no satisfaction.	Strong interest and fantasy. Practice as pre-treatment.	6	Nil fantasy, interest or practice.	Stable "affair".		1 year	
13	47	S	3	6	Nil fantasy, interest or practice ever.	B. 28 years. Many partners and "affairs".	As in col. 6. i.e. no change after treatment.	As in col. 6. i.e. no change after treatment.	Hom.	As in col. 6	On stilboestrol. Claims nil practice but unlikely that this is true.	6	As in col. 6	As in col. 11		1 year	
14	36	M (6 yr)	1	6	Several girl friends pre-marriage. Kissing only. Married to frigid female. No S.I. Nil practice of any kind. Nil interest or fantasy.	M.M. 20 yrs. Strong interest and fantasy. Very large number of partners.	As in col. 6. i.e. no change after treatment.	As in col. 6. i.e. no change after treatment.	Hom.	Put on stilboestrol. Strong interest and fantasy. Reduced practice though still continues.	As in col. 9	6	As in col. 6	As in col. 9		7 mths.	

TABLE 2.—CONTINUED

No.	1	2	3	4	5	6		7		8		9		10		11		12		13		14		15			
						Pre-treatment practice		Immediate post-treatment		Follow-up trend		Present status		Length of follow-up													
		Age on referral	Marital status	Mode of referral	K.R.	Het.	Hom.	Het.	Hom.	Het.	Hom.	Het.	Hom.	K.R.	Het.	Hom.	As in col. 6	As in col. 7	As in col. 6	As in col. 7	As in col. 6	As in col. 7	As in col. 9	As in col. 9			
15	42	S	1	5	5	A few girl friends over the years. No S.I. Some interest. Occasional fantasy.	M.M. 25 yrs. B. 20 years. Strong interest and fantasy.	As in col. 6 i.e. no change after treatment.	As in col. 7 i.e. no change after treatment.	Het.	Hom.	As in col. 6	As in col. 7	As in col. 6	Het.	Hom.	As in col. 6	As in col. 7	As in col. 6	As in col. 7	As in col. 6	As in col. 7	Het.	Hom.	As in col. 9	As in col. 9	6 mths.
16	41	S	3	6	6	Nil interest, fantasy or practice ever.	M.M. and fellatio 15 years. Very Strong interest and fantasy over 20 years. Always boys aged 11-14 years.	As in col. 6 i.e. no change after treatment.	As in col. 7 i.e. no change after treatment.	As in col. 6	As in col. 7	As in col. 6	As in col. 7	As in col. 6	As in col. 6	As in col. 7	As in col. 6	As in col. 7	As in col. 6	As in col. 7	As in col. 6	As in col. 7	As in col. 6	As in col. 7	As in col. 6	As in col. 7	2 mths.

Key to Table 2

- Marital Status:  
 M = Married  
 S = Single
- Mode of Referral:  
 1 = Completely of own accord.  
 2 = Of own accord, but following court appearance for homosexuality.  
 3 = On an order of the court.
- Kinsey Rating (K.R.):  
 0 = Completely heterosexual.  
 1 = Mainly heterosexual, occasionally homosexual.  
 2 = Mainly heterosexual, more than occasionally homosexual.  
 3 = Equally homosexual and heterosexual.  
 4 = Mainly homosexual, more than occasionally heterosexual.  
 5 = Mainly homosexual, occasionally heterosexual.  
 6 = Completely homosexual.
- B. = Buggery.  
 M.M. = Mutual Masturbation.  
 S.I. = Sexual Intercourse.



In discussing these results, attention is drawn to the fact that of the 11 patients who had improved immediately post treatment, one (number 11) is presumed to have relapsed about three months after treatment, and the follow-up period of five patients (numbers 6 to 10) is still three months or less. Until a much longer follow-up period has elapsed, any conclusions must be tentative—and even then we must carry out a fully controlled trial.

Nevertheless, for the present, we consider our results promising, particularly for those patients who were under 30 when they presented for treatment. Out of 8 patients in this category, 7 had improved on completion of treatment. Of those aged between 30 and 40, 3 out of 4 improved, and one of those relapsed after three months. The worst results, as might be expected, were for those aged over 40, of whom only 1 out of 4 improved.

A particularly satisfactory feature is that we have not noticed the steady drift back to homosexuality, noted by Freund (1960), even in those of his patients who developed increased heterosexuality after treatment. On the contrary, in all cases but one (number 11) the improvement noted immediately following treatment has either been maintained, or has been advanced during the post treatment period. This is possibly due to some extent to the “booster” sessions, which are given at increasing intervals following treatment.

The therapeutic importance of the patient/therapist relationship is discussed in the next section. Because the sexual status of our improved patients appears to be constantly, if in some cases slowly, improving, in the post-treatment period, no further discussion as to the relationship between such variables as initial and final sexual behaviour appears advisable at present. For instance it may be that patients who have never had any heterosexual contact beyond social mixing will prove unlikely to achieve full heterosexual adjustment, a possibility put forward on theoretical grounds by Scott (1964), and supported by the (psychoanalytic) treatment results of Bieber *et al.* (1963). For the present we merely present our results in brief descriptive form and postpone drawing any theoretical conclusions until a much longer follow-up period has elapsed.

An important point which will also be discussed in detail in a later contribution is the non-sexual clinical status of our patients. Four of them presented initially with psychiatric symptoms other than sexual ones, although in all four cases it appeared that the patients' sexual life was the factor precipitating their seeking psychiatric help. At least four of the other patients required medication for depression, anxiety etc., immediately before or early in treatment. Clearly the diagnosis and treatment of psychiatric symptomatology, whether this is secondary to the homosexual behaviour, or independent of it, together with the description of any co-existent personality disorder, makes it necessary that the conditioning treatment of a sample of homosexual patients such as ours be carried out jointly by a psychologist and a psychiatrist. It is equally undesirable for patients to be handed over completely to a psychologist without psychiatric training or responsibility, as it is for a psychiatrist, with little or no background in learning theory, to design and carry out behaviour therapy techniques, such as that described in the present paper. It is only by drawing on the combined experience and expertise of psychology and psychiatry that the best results will be obtained.

(b) *Patient/therapist relationship*

Inevitably, whenever a systematic conditioning procedure is used, the question arises of the degree of importance of the patient/therapist relationship over and above the specific technique used. Coates (1964) has argued that in all of the conditioning techniques used so far, the patient/therapist relationship has played a major, if not always recognized, part.

The degree of importance attached to it by behaviour therapists has varied. Meyer and Gelder (1963) state that "those who wish to make use of learning theory to treat their patients should not ignore the relationship between the patient and the therapist". On the other hand, Wolpe (1962) has claimed to have specifically demonstrated the lack of importance of the patient/therapist relationship. He handed over the treatment of a phobic patient half-way through to a junior psychiatrist. The patient made a complete recovery. Wolpe claims that this implies that the relationship between himself and the patient was not relevant to the outcome of the treatment. However, the patient was throughout in contact with a therapist, and the degree to which he perceived his therapist as providing support, reassurance and so on is quite unknown. While behaviour therapists might prefer to regard the situation as a purely experimental one, the patient himself has a reinforcement history of having a "supportive" type of relationship with doctors and others associated with therapeutic work. Without accepting in any sense the analytic insistence on the importance of this relationship being "transference" in type, it is impossible for us to ignore the fact that some at least of our homosexual patients appear to like to talk to us, however superficially, and say that they "feel better" as a result. We have not at any time made any attempt to encourage them to talk, nor have we in any way "interpreted" what they have said.

Perhaps most important is the fact that we are dealing with a form of behaviour which is socially unacceptable, and about which most of our patients feel guilty and anxious. It follows that the therapist has to reassure the patient that he is not being judged but helped, or at any rate that the attempt to help will be made. In addition to attempting to establish a generally good background *rapport*, we sometimes offer advice as to real life behaviour, particularly when the attraction to men has diminished, and that to females is beginning to increase. For instance we have advised two patients to attend ballroom dancing lessons, and so equip themselves with an important social skill, which will make contact with females easier, and hence possibly more successful.

Neither of those involved in this work has been specifically trained to use psychotherapeutic techniques, let alone psychoanalytic ones; one of us is an experimentally trained clinical psychologist, the other is a trainee psychiatrist at an early stage of his psychiatric career. It seems, therefore, most unlikely that such simple psychotherapeutic devices as those discussed above, have been alone sufficient to account for the promising results obtained to date. The question as to whether they are a necessary part of treatment, and if so, the extent of their contribution, must await a future controlled trial, in which both experimental and control groups will receive the same degree of attention and interest from the therapist.

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