CREATIVE NOVATION BEHAVIOUR THERAPY AS A PROPHYLACTIC TREATMENT FOR CANCER AND CORONARY HEART DISEASE: PART II—EFFECTS OF TREATMENT

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Summary—In this article we consider the effectiveness of creative novation behaviour therapy in preventing cancer and coronary heart disease in disease-prone probands, and also its effectiveness in extending life for patients suffering from terminal cancer. In all cases, suitably matched controls are provided as part of the general methodology, and results are reported to testify to the effectiveness of the therapy, whether administered a long-term individual therapy, group therapy, or bibliotherapy plus short-term individual treatment. We also consider the negative effects of psychoanalysis on outcome.

INTRODUCTION

In the preceding section of this article, we have described a method of behaviour therapy which can be used to prevent cancer and coronary heart disease (CHD) in disease-prone but otherwise healthy probands. It has been shown that cancer-prone and CHD-prone probands can be identified in terms of an interviewer-administered stress/personality inventory which classifies individuals into 4 types, a cancer-prone type (Type 1), a CHD-prone type (Type 2), and 2 healthy types (Type 3 and Type 4). We have shown in a series of prospective studies that this typology is over 6 times as successful in predicting cancer or CHD as smoking, cholesterol level, and blood pressure (Eysenck, 1987, 1988a, b, 1991; Grossarth-Maticek, Eysenck & Vetter, 1988; Grossarth-Maticek, Kanazir, Schmidt & Vetter, 1982; Grossarth-Maticek, Kanazir, Vetter & Jankovic, 1983).

In our studies of the effectiveness of our system of behaviour therapy, we have relied on a mixture of *matching* control and therapy groups, and *randomization*. Individuals were matched on sex, age (within 5 yr), smoking, cholesterol level, blood pressure and personality type (as described in Part I of this paper). Once pairs had been matched, members were assigned on a chance basis to treatment or control groups. There has been much controversy regarding the degree to which randomization can be relied upon to iron out inequalities between treatment and control samples (Hawson & Urbach, 1989), and we decided that reliance on matching (for the major risk factors disclosed in prior studies) in combination with randomization (for other, presumably less important factors) would adequately render ordinary tests of significance operative.

Study 1: Extended Individual Therapy

In 1972, two sets of persons underwent detailed investigation in Heidelberg, amounting to 2449 persons in all. These constituted a representative group of 1026 persons, and a stressed group of 1443 persons. All were assigned to one of four personality types as already explained in Part I of this study.

The normal group was selected on a random basis from the electoral register, with age and sex limitations arranged on an *a priori* basis. The stressed group was nominated as being severely stressed psychologically by members of the normal group from friends and relatives they knew well, and/or smoked heavily or had high cholesterol levels. Probands were assigned to personality types on the basis of an interviewer-administered personality inventory. Cancer-prone individuals (Type 1) were so designated on the basis of such behaviours as suppression of emotion (reactions and expressions), and failure to deal appropriately with interpersonal stresses of various kinds,

leading to the development of feelings of hopelessness, helplessness and depression. CHD-prone individuals (Type 2) were so designated because of strong feelings of anger, hostility and aggression, together with a failure to deal appropriately with interpersonal stresses. Type 3 was characterized by behaviour alternating between those characteristic of Types 1 and 2, while Type 4 showed appropriate demonstrativeness of emotion and a capacity to deal effectively with interpersonal stresses. Additional data on the characteristics of the cancer-prone and the CHD-prone personality are given by Grossarth-Maticek, Eysenck and Vetter (1985). Interviews were carried out by specially trained student investigators, who were 'blind' to the treatment conditions.

The age of the probands in these studies in 1972 was between 30 and 69 yr; half were men, half were women. The mean age of the probands was 50 yr. A group of 192 persons was selected for an intervention study, and these constitute the sample which forms the basis of this article. Pairs were formed from the members of the stressed group, such that they were similar in age, sex, degrees of stress, intensity of cigarette-smoking, blood pressure, blood sugar and cholesterol.

Originally, 134 pairs of Type 1 probands and 138 pairs of Type 2 probands had been approached with an offer of psychotherapy; of the former, one or both members refused in 34 cases, of the latter, in 46 cases, thus leaving 100 pairs of Type 1 probands and 92 pairs of Type 2 probands. Care was taken to exclude from the study anyone suffering from heart infarct, cancer, stroke, or any other severe chronic disease; details concerning persons for exclusion have been given elsewhere (Grossarth-Maticek, Schmidt, Vetter & Arundt, 1984). Members of each group were assigned to a control group or to a therapy group on a random basis.

From the beginning of 1972 to the end of 1974 several attempts were made to ascertain a number of psychological and medical data. Cholesterol, blood sugar and blood pressure were measured three or four times before the beginning of therapy, the different measures being separated by 1–3 months. The therapy continued for up to 6 months, lasting between 20–30 hr for each proband; therapy was always conducted by Dr Grossarth-Matick personally. After therapy was concluded, a further set of measures was instituted, including a minimum of two measures of blood pressure, blood cholesterol and blood sugar. Equally, psychosocial factors were ascertained before the beginning of therapy and 6–12 months after its conclusion, investigating in particular the belongingness of probands to one of the types, and the degree to which that type was expressed.

Crucial to our study is of course the efficacy of the treatment in producing a change in the probands' behaviour, feelings, etc., as expressed in the questionnaire. Taking the cancer-prone group first, we find that for the control group there is no significant change in their Type 1 inventory answers from first application to second (post treatment) application 6–12 months later (9.84 ± 0.47 to 9.76 ± 0.92). For the Therapy group there is a change significant at a $P < 0.0001$ level (9.78 ± 0.76 to 5.7 ± 2.21). Results for the CHD-prone group, using scores on the Type 2 inventory, are similar. For the control group there is no significant change (9.17 ± 1.00 to 9.97 ± 1.28). For the therapy group there is a change significant at a $P < 0.0001$ level (8.96 ± 1.19 to 4.87 ± 3.04). Thus self-evaluation of the probands discloses no change in the control group, but a very significant diminution in the size of the risk factors measured by the questionnaire. These subjective evaluations of course require validation along more objective lines, i.e. greater degree of survival after therapy in the therapy groups.

Table 1 shows the composition of the various groups according to sex, Table 2 according to age. Table 3 shows the effects of prophylactic behaviour therapy on the cancer-prone and the CHD-prone probands respectively after 13 yr. It will be clear that treatment by means of creative

Table 1. Sex composition of therapy and control groups

Group	Not ascertained	Male	Female	Total
Ca-control	0	30	20	50
%	0.00	60.00	40.00	100
CHD-control	0	29	17	46
%	0.00	63.04	36.96	100
Ca-therapy	0	28	22	50
%	0.00	56.00	44.00	100
CND-therapy	1	26	19	46
%	2.17	56.52	41.30	100
Total	1	113	78	192
%	0.5	58.9	40.6	100

Table 2. Age composition of therapy and control groups

Age/group	0–39	40–49	50–59	60–69	Total
Ca-control	3	24	18	5	50
%	6.00	48.00	36.00	10.00	100
CHD-control	3	18	18	7	46
%	6.52	39.13	39.13	15.22	100
Ca-therapy	7	15	15	9	50
%	14.00	30.00	38.00	18.00	100
CHD-therapy	3	20	14	9	46
%	6.52	43.48	30.43	19.57	100
Total	16	77	69	30	192
%	8.3	40.1	36.0	15.6	100

Table 3. Deaths and incidence of cancer and CHD in therapy and control groups; individual therapy

	n	Cancer deaths	Cancer incidence	Other causes of death	Living
I.					
Control	50	16	21	15	19
		32%	42%	30%	38%
Therapy	50	0	13	5	45
		0	26%	10%	90%
Total	100	16	34	20	64
		16%	34%	20%	64%
II.					
Control	46	16	20	13	17
		34.8%	43.5%	28.3%	36.9%
Therapy	46	93	11	6	37
		6.5%	23.9%	13%	80.4%
Total	92	19	31	19	54
		20.6%	33.7%	20.7%	58.7%

novation behaviour therapy has had a highly significant prophylactic effect, preventing deaths from cancer in probands of Type 1, and death from coronary heart disease in probands of Type 2. In each case there is also an effect of a prophylactic kind on death from other causes. In view of the high unreliability of diagnoses as recorded on death certificates (Eysenck, 1986), the precise allocation of cause of death should not perhaps be taken too seriously but the overall difference in the proportions still alive between control groups and therapy groups does indicate the efficacy of the treatment.

Table 3 also shows the incidence of cancer and CHD 13 yr after the beginning of the experiment. It is apparent that in both therapy and control groups a fair proportion of probands are suffering from cancer or CHD, but have not yet died. Incidence here and in later studies was ascertained by interview with the physicians treating the probands after receiving permission from the proband to consult his/her physician. The relative proportions of probands suffering from cancer or CHD was not dissimilar to those of probands dying from either. Presumably most, if not all, probands now suffering from cancer and CHD will eventually die of the disease. Behaviour therapy may either *prevent* cancer and CHD, or *postpone* the onset of the disease by some 12 yr; only another 13 yr follow-up of these probands will give us a final answer to this question.

It is important to detail the precautions taken in this study to render the potentially revolutionary results acceptable.

Names of the probands had been deposited in independent university departments (Zurich and Karlsruhe) prior to ascertainment of mortality, which was carried out first in 1982 and again in 1986; we will be concerned with the data for the second, 13 yr follow-up. Collection of mortality data was carried out by Dr E. Heller, an independent assessor from the Statistical Institute of the University of Karlsruhe. Dr Heller also interviewed a random sample of the students who had taken part in the ascertainment of data from our original sample, to verify the methods used.

Previous reports of the 10-yr follow-up gave similar but incomplete results, as no incidence results were available, and several probands could not then be located, having moved from Heidelberg where the study was carried out. In this 13-yr follow-up we were able to contact all 192 probands, so that there are no omissions. This study seems to disprove at a high level of confidence (all statistical tests are well outside the $P = 0.01$ level) the hypothesis that cancer and CHD are physical diseases which cannot be affected in their course by psychological means.

Table 4. Deaths and incidence of cancer and CHD in therapy and control groups; group therapy

n not contacted	Therapy 245 6		Control 245 11	
	Mortality 239	Incidence 235	Mortality 234	Incidence 231
Cancer	18 7.5%	75 31.9%	111 47.4%	129 55.8%
CHD	10 4.2%	29 12.3%	36 15.4%	45 19.5%
Other causes of death	20 8.4%	—	33 14.1%	—
Living	191 79.9%		56 23.9%	

Study 2: Group Therapy

The methods used for group therapy have been described in the first article in this series. The method was applied to one of two groups carefully matched for age, sex, personality type (Type 1 or Type 2) and smoking history. From each matched pair, one partner was randomly assigned to the treatment, one to the control group. The choice was made from the population of our 1973 study, most of the results of which have not yet been analysed. The total population studied contained 3800 probands all of whom were rated as severely stressed on the basis of interviewer-administered questionnaire, heavy smoking, and/or high cholesterol level. Of those approached, there were 86 refusals, leaving 245 matched pairs. On follow-up after 7 yr (1974–1981), 6 persons in the therapy group and 11 persons in the control group could not be contacted. For the ascertainment of incidence, a further 4 probands in the therapy group and a further 3 probands in the control group could not be contacted. All the treatment , as in Study 1, was carried out by Professor Grossarth-Maticek.

Results of the 7 yr follow-up are given in Table 4. The follow-up was conducted as in the case of the previous study, i.e. students rang up probands or their families to ascertain whether probands were alive or dead; visited probands or their surviving families; finally, consulted the death register to extract and copy death certificates. Dr Heller independently checked the correctness of the procedure, including all the death certificates. Incidence was ascertained as in Study 1, i.e. by personal contact with the treating physician by express permission of proband.

It will be seen that both cancer and CHD mortality are very significantly higher in the control group, as is death from other causes. Incidence rates are also very significantly higher in the control group for cancer, but with a difference below our selected $P = 0.01$ level of significance for CHD. Most telling is the difference regarding those 'still living'—79.9% in the therapy group, 23.9% in the control group. The results of the group therapy study support those of the individual therapy group in demonstrating the value of behaviour therapy in preventing death from cancer and CHD, and in lowering the incidence from cancer and possibly from CHD.

Study 3: Bibliotherapy

We have already explained our application of bibliotherapy in the first article of this series. The text constituting the description of the therapy, and containing the suggestions for improvements in behaviour and thinking, has been given in the Appendix to that article. The written statement

Table 5. Deaths and incidence of cancer and CHD in therapy and control groups; bibliotherapy and short individual treatment

	Causes of death									
	Cancer		CHD		Other		Total	Living	Not investigated	
	D*	I*	D*	I*	D*	I*				
Control	106	162	145	203	164	—	415	78	7	15
n = 500	21.5%	33.4%	29.4%	41.8%	33.3%	—	84.2%	15.8%	1.4%	3%
Control with use	22	37	31	40	28	—	81	19	0	2
of psychoanalytic text. n = 100 (Placebo group.)	22%	37.7%	31%	40.8%	28%	—	81%	19%	0%	2%
Therapy group with	27	99	47	132	115	—	189	409	2	14
behaviour therapy text. n = 600	4.5%	16.9%	7.9%	22.5%	19.2%	—	31.6%	68.4%	0.3%	2.3%

*D = died; I = incidence.

was introduced by our interviewer at the beginning of treatment, and followed by 3–5 hr of individual discussion of its contents, application and meaning for the particular proband. It is not possible to assign particular proportions of any success of the treatment to the written statement, as divorced from the therapeutic content of the interviews; we can only evaluate the combined effects. The original interview was carried out by Professor Grossarth-Maticek; the succeeding ones by specially trained students.

The probands were selected from the 5700 members of the 1973 prospective study, 600 probands, all of either Type 1 or Type 2 constituting the therapy group. A control group of 500 probands equated for type, smoking, age and sex was chosen to receive no treatment, and a group of 100 probands, similarly matched, was chosen to receive a placebo treatment to evaluate the effects of receiving a printed statement, and discussing its application with interviewers in a manner similar to the way the therapy had been organized. This group, however, received psychoanalytic explanation and suggestions, which were not believed to be active ingredients in the therapy procedure adopted for the first group.

Results are given in Table 5. There are no statistically significant differences between the control group and the placebo group, which may therefore be combined and considered a single control group. Compared with this control group, the treatment group fared significantly better. In the control group, 128 died of cancer, 176 of CHD; in the treatment group only 27 died of cancer, and 47 of CHD. For 'death from other causes', the figures are 192 and 115. Clearly the bibliographic method had a very strong prophylactic effect.

As far as the incidence figures are concerned, which were ascertained as in the previous two studies, it is again found that for cancer the difference between therapy and control group comfortably exceeds our $P = 0.01$ level of significance, but this time so does the difference for CHD. We would seem justified in saying that for incidence also, bibliotherapy along behaviour therapy lines has a marked prophylactic effect. The results may be more clear-cut than those for group therapy because the numbers involved were over twice as large, or because the follow-up period was almost twice as long (13-yr! 1973–1986).

Study 4: Illness, Absence and Therapy

In this study we matched 362 pairs of male probands in the 1973 sample on personality type, age and sex, and allocated one member of each pair to the therapy group, the other to the control group, on a random basis. We then obtained information from all probands concerning the number of days each year spent in hospital during that time. All probands were taken from the stressed group, which may account for the amount of illness experienced.

Probands were asked at the *termination* of the study about duration of stay in hospital for each of the preceding years. They were encouraged to check with their doctors, and with the hospital, concerning specific dates. Relatives were also quizzed by the students carrying out the interviews. For those who died in the course of the study, information was obtained through relatives, covering the time preceding the proband's last year only. No doubt this information is far from perfect, but random errors cannot account for the large differences observed. The type of therapy used was bibliotherapy, very much as described in the previous section.

The total number of days missed through illness was 6194 for the therapy group, and 10,136 for the control group, giving means of 19 and 28 respectively, a difference of 39%. Clearly, the prophylactic effects of the autonomy training are wide-reaching in their significance. Details of the outcome of the study are available in Fig. 1. The differences are highly significant beyond the 0.01 level.

These figures may be compared with figures obtained for another sample of 95 pairs of probands. Prior to the therapy, the average stay in hospital was 15 days for the therapy group and 10 days for the control group, a quite insignificant difference averaged over a 10 yr period. After therapy the mean of the therapy group declined to 6 days, that of the control group increased to 42 days, a highly significant difference for the 12 yr period covered.

Is duration of stay in hospital related to personality type? We have analysed our data for the three prospective studies along these lines, with results shown in Table 6. It is clear that Types 1 and 2, i.e. the cancer-prone and the CHD-prone types, are much more likely to spend time in hospital than Type 3, with Type 4 doing marginally better than Type 3.
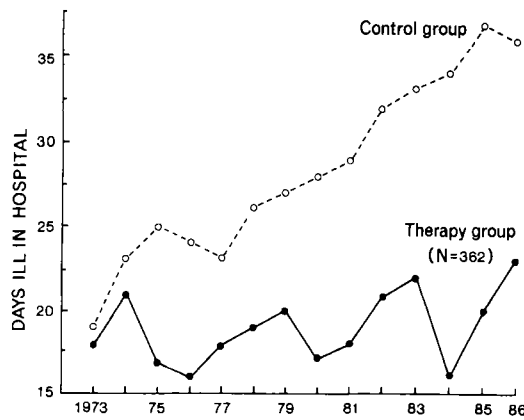
Fig. 1. Days away in hospital for therapy and control groups.

Study 5: Therapy of Terminal Cancer Patients

The possibility of prolonging the lives of sufferers from inoperable cancer through the use of behaviour therapy was investigated in a study in which a total of 24 pairs of cancer sufferers was formed, matching the members of each pair for type of cancer, progress of cancer, type of treatment, age and sex. Patients were then allocated to control or treatment groups on a random basis, and followed up until death. Duration of survival constituted the dependent variable. Table 7 shows the results of this study, as well as age and sex distribution. All treatment was carried out individually by Professor Grossarth-Maticek. Additional detail is given elsewhere (Grossarth-Maticek, 1980).

It will be seen that survival averaged 5.07 yr for the treated group, and 3.09 yr for the control group; the difference is highly significant by t-test. Plus and minus signs for each of the 24 pairs shows whether the treated patient died first ($-$sign) or second ($+$sign); the $=$ sign indicates no difference. There are 19 $+$ signs and only 4 $-$ signs, with 1 $=$ sign. By a simple sign test, too, the difference is highly significant. The data indicate clearly that behaviour therapy can successfully be used to prolong the lives of sufferers from terminal cancer.

In case it should be objected that these data are "too good" in the case of constant ascertions that psychological methods of therapy cannot affect physical diseases like cancer, we may perhaps draw attention to the work of Spiegel, Bloom, Kraemer and Gottleib (1989), who demonstrated an even stronger effect in comparing groups of terminally ill breast cancer women receiving or not receiving psychotherapy. Other studies are quoted in the first part of this paper. The evidence is too strong for us to dismiss even the possibility of affecting bodily diseases by psychological treatment.

Table 6. Length of stay in hospital of different personality types in three prospective studies

Type	n	Missing data	Average stay in hospital per annum for 1972–1985, or until 1 yr before death
Heidelberg normal study			
1	109	31	29
2	170	39	28
3	188	41	7
4	391	62	5
Yugoslav study			
1	303	42	16
2	339	35	14
3	217	19	13
4	482	50	4
Heidelberg stressed study			
1	489	72	39
2	309	60	38
3	162	24	3
4	73	5	1

Table 7. Survival of terminally-ill cancer patients treated or not treated with behaviour therapy

Type of cancer	Number of pair of patients	Survival time, years		Sex	Age	
		Therapy group	Control group		Therapy group	Control group
Scrotal cancer	1	5.8	3.2+	m	34	35
Stomach cancer	1	4.8	1.8+	m	64	63
	2	2.4	2.3+	m	59	59
Bronchiolar	1	1.7	2.4−	m	42	42
	2	5.6	1.5+	m	59	60
	3	4.2	1.6+	m	60	60
	4	3.2	1.1+	m	47	46
	5	1.7	1.7=	m	39	39
	6	4.5	1.2+	m	58	98
	7	5.2	1.0+	m	63	64
Corpus uteri	1	6.8	4.2+	f	64	65
	2	4.5	4.8−	f	66	66
	3	7.2	3.5+	f	49	48
	4	8.2	3.1+	f	50	51
Cervical	1	5.5	4.2+	f	41	41
	2	6.1	4.0+	f	46	46
	3	3.2	3.3−	f	38	37
	4	4.5	4.1+	f	50	49
	5	2.8	3.6−	f	39	40
Colon and rectum carcinoma	1	9.5	4.2+	m	64	64
	2	7.5	2.1+	f	56	56
	3	6.3	4.9+	m	55	56
	4	4.8	4.3+	f	61	60
	5	5.7	4.1+	f	52	52
Total	24	5.07	3.09			

Study 6: Behaviour Therapy and Chemotherapy Compared

Are the effects of behaviour therapy comparable with those of chemotherapy, as far as inoperable cancer is concerned? And are the effects of both types of treatment additive or synergistic? A special experiment was designed to answer these questions, and also to discover whether behaviour therapy could change the rate of lymphocyte production, thus improving the efficacy of the immune system (Grossarth-Maticek & Eysenck, 1989).

In this study, 100 women with mammary carcinoma and visceral metastases constituted the sample. One hundred and twenty-nine women with breast cancer and visceral metastases, to whom a Doxorubicin (adriblastine or adriamycin) combination chemotherapy had been proposed, were asked whether they would like to receive psychotherapy at the same time. Seventeen refused psychotherapy, and another 56 declined chemotherapy. Fifty of the women who accepted chemotherapy were divided into pairs, matched on age, social background, extent of cancer and medical treatment. A similar procedure was applied to 50 of those who refused psychotherapy, while the remainder were excluded from the design. One member of each pair was chosen at random to be treated with psychotherapy, while the other received no psychotherapy. A 2 × 2 design was therefore completed (psychotherapy/no psychotherapy; chemotherapy/no chemotherapy) with 25 women in each condition. Patients were allocated to the different psychotherapies at random. Twenty-four patients received creative novation behaviour therapy, 12 underwent depth psychotherapy, while the remaining 14 were treated with orthodox behaviour therapy (relaxation training and desensitization). Patients who accepted or refused chemotherapy were distributed proportionately to the different psychotherapies.

The sequence of events is summarized in Table 8. Chemotherapy consisted of Doxorubicin (adriamycin) in combination with other agents. Doxorubicin was combined with cyclophosphamide (Endoxana) in 7 pairs, with fluoruracil in 13 pairs, and with vincristine, cyclophosphamide and prednisolone. Chemotherapy was administered in 3–4 week cycles and repeated between four and nine times. Thirty hours of psychotherapy were provided, as shown in Table 1. Various alterations were made in chemotherapy as appropriate.

The outcome variables included the interval between surgery and the detection of metastases or new recidivisim and the interval between metastases and death. These two intervals in combination comprise the total survival time. The results presented here concern the relationship between

Table 8. Temporal description of chemotherapy-behaviour therapy
experiment

t_0	Diagnosis of breast cancer
	$\downarrow$
t_1	Operation
	$\downarrow$
t_2	Radiation or adjuvant chemotherapy
	$\downarrow$
t_3	Diagnosis of visceral metastases
	$\downarrow$
t_4	Combination chemotherapy proposed
	$\downarrow$
t_5	Refusal or acceptance of chemotherapy and psychotherapy
	$\downarrow$
t_6	10 hr of psychotherapy
	$\downarrow$
t_7	First cycle of combination chemotherapy
	$\downarrow$
t_8	10 hr of psychotherapy
	$\downarrow$
t_9	Second cycle of combination chemotherapy
	$\downarrow$
t_{10}	10 hr of psychotherapy
	$\downarrow$
t_{11}	Third cycle of combination chemotherapy
t_{12}	$\cdots$

intervention variables (chemotherapy and psychotherapy) and outcome variables (total survival time, changes in leucocyte concentration and lymphocyte percentage, and changes in psychosocial variables). Multiple linear regression and analyses of variance or covariance were employed in the statistical analyses.

We postulated the following: (H_1) cancer patients who have undergone psychotherapy have a longer survival time than patients not treated by psychotherapy. (H_2) Psychotherapy and chemotherapy have a synergistic effect on survival time. (H_3) Different therapeutic interventions and concepts have different effects on survival time.

Table 9 shows that all three hypotheses are in fact borne out. Cancer patients who have undergone psychotherapy have a significantly ($P < 0.001$) longer survival time than patients not treated by psychotherapy. The statistical procedure used for testing our propositions was analysis of variance. The mean survival time of all patients was 15.7 months. The maximum survival time was 38 months, the minimum survival time was 6 months. Persons who received neither chemotherapy nor psychotherapy lived 11.28 months after the diagnosis of visceral metastases, whereas patients with no chemotherapy but psychotherapy treatment lived 3.64 months longer on average (14.92 months). The effects of chemotherapy but no psychotherapy was 14.08 months' survival time, not significantly different from psychotherapy with no chemotherapy.

Psychotherapy and chemotherapy have a significant ($P < 0.05$) interaction effect on survival time. Those persons who had undergone both chemotherapy and psychotherapy had a mean survival time of 22.40 months. Chemotherapy alone increased survival time by 2.80 (14.08–11.28) months. If the effects of psychotherapy and chemotherapy were additive, one would expect a survival time of $11.28 + 2.80 + 3.64 = 17.72$ months for the group with combined therapies. However, the mean survival time of the chemotherapy plus psychotherapy group was 22.40 months, exceeding the additive value by 4.68 months ($P = 0.05$). This indicates that a positive interaction between chemotherapy and psychotherapy takes place, and that this operates synergistically.

Since chemotherapy was not randomly assigned to Ss, it is possible that differences in the initial values of metastases detection time or psychosocial variables contribute to the pattern of results. These factors were therefore controlled by multiple regression. In the case of chemotherapy, the

Table 9. Survival of terminally-ill cancer patients in months after treatment or no treatment
(Grossarth-Maticek & Eysenck, 1989)

	Chemotherapy		
	No	Yes	Totals
No	mean = 11.28 n = 25	mean = 14.08 n = 25	mean = 12.68
Yes	mean = 14.92 n = 25	mean = 22.40 n = 25	mean = 18.66
Totals	mean = 13.10	mean = 18.24	grand mean = 15.67 n = 100

Table 10. Effects of different methods of psychotherapy on
terminally-ill cancer patients

		Survival time, months
Behaviour therapy	mean	15.29
	n	14
Creative novation therapy	mean	23.54
	n	24
Depth psychotherapy	mean	12.83
	n	12
Total	mean	18.66
	n	50

results of this procedure depended on the method of analysis. If chemotherapy was analysed as a dummy variable (yes = no), its effects after controlling for initial values of metastastes detection time and psychosocial variables was no longer significant. If, on the other hand, chemotherapy was analysed in terms of the number of treatment periods (which frequently extended beyond the three cycles illustrated in Table 8), it retained its statistical significance. In contrast, the effects of psychotherapy were scarcely reduced by controlling for these initial factors; this is to be expected, since psychotherapy was randomly allocated to Ss. After controlling for initial values of psychosocial values and metastases detection time, the interventions taken together account for 37% of the variance in survival time.

The three forms of psychotherapy were not equivalent in their effects. The mean survival time in months of patients in the three conditions is shown in Table 10. Creative novation therapy led to significantly longer survival than either of the other procedures ($P < 0.001$). This difference remains significant even when initial conditions are controlled by analysis of covariance.

There was also a significant difference in lymphocyte production when patients receiving chemotherapy were divided into those with and those without psychotherapy. Figure 2 shows that those patients receiving psychotherapy increased the percentage lymphocyte concentration over time (Grossarth-Maticek & Eysenck, 1989). Thus it seems possible that the psychotherapeutic intervention may have its effect through the involvement of the immune system. The observed differences were statistically significant (Grossarth-Maticek & Eysenck, 1989). A more detailed examination of the evidence linking psychosocial factors and personality, on the one hand, and immune responses on the other is given by Fox (1981), Baker (1987) and Eysenck (1991); the latter reference also includes a general outline of a theory linking the two sides, and explaining how it is possible for psychological and behavioural intervention to affect so profoundly physical diseases like cancer and CHD. Temoshock (1987) and Kanazir, Djordjeric-Markhovic and Grossarth-Maticek (1984) have also contributed to the development of our theoretical understanding of these relations.

Effects of Freudian Therapy on Cancer and Coronary Heart Disease

It might be thought that behaviour therapy acts, not through any specific aspect of our methodology, but through a kind of placebo effect, perhaps because of the attention paid to probands and patients by the therapist. A placebo group was included in one of our studies (Study 3), but as this was mainly concerned with the effects of bibliotherapy the failure of the placebo group to differentiate itself from the control group does not suffice to disprove the placebo
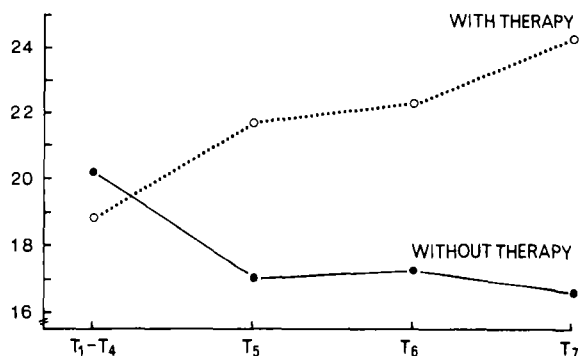

Fig. 2. Percentage of lymphocytes at various stages after behaviour therapy, or no therapy. (Grossarth-Maticek & Eysenck, 1989.)

Table 11. Matching of groups treated psychoanalytically with control groups

Therapy	Type 1	Type 2	Type 3	Type 4	n
(1) Psychoanalysis discontinued after 2 yr or less	162	90	109	1	362
(2) Psychoanalysis continued for more than 2 yr	102	46	108	3	259
(3) Control group for (1)	162	90	109	1	362
(4) Control group for (2)	102	46	108	3	259
(5) Control group for (1 + 2)	187	197	121	116	621

hypothesis as far as individual and group therapy are concerned. We have tried to use records of patients who had psychoanalysis to provide a more realistic control for our intervention studies, relying as before on specific matching procedures regarding age, sex, personality type and smoking. The method is far from perfect, but in view of the fact that psychoanalysis is widely used both as a prophylactic treatment and as part of medical treatment for cancer patients, the results may at least be suggestive.

In our series of prospective studies (Eysenck, 1988a, b) we asked questions of the probands regarding their being in treatment, or having recently been in treatment, by psychoanalysis or similar dynamic methods of psychotherapy. The designation of the treatment involved is inevitably somewhat less than accurate because patients are not always clear about the precise name attached to the treatment they have received, therapists often use eclectic mixtures of methods, and even within a given method they often proceed in highly individualistic fashion. However, psychoanalysis is still widely used in Germany, and the great majority of therapists treating members of our sample would undoubtedly consider themselves as psychoanalysts, and would have been trained accordingly (Grossarth-Maticek & Eysenck, 1990).

We made a clear distinction between probands who discontinued treatment after 2 yr or less, and those who continued for more than 2 yr without discontinuing. None of these probands

Table 12. Mortality over 9 yr of control and psychoanalytically treated groups

Therapy	Type 1		Type 2		Type 3		Type 4	
(1) Psychoanalysis discontinued after 2 yr or less:		%		%		%		%
Cancer	11	7.1	4	4.6	5	4.8	1	100
CHD	7	4.5	5	5.8	6	5.7	0	0
Other	7	4.5	5	5.8	6	5.7	0	0
Still living	129	83.7	72	83.7	87	83.6	0	0
Not located	8	4.9	4	4.4	5	4.5	0	0
Total	162		90		109		1	
(2) Psychoanalysis continued for more than 2 yr:		%		%		%		%
Cancer	9	9.3	3	6.5	8	7.7	1	33.3
CHD	8	8.2	6	13.0	8	7.7	1	33.3
Other	8	8.2	5	10.8	7	6.7	1	33.3
Still living	72	74.2	32	69.5	81	77.8	0	0
Not located	5	14.9	0	0	4	3.7	0	0
Total	102		46		108		3	
(3) Control group for (1):		%		%		%		%
Cancer	2	1.3	1	1.2	0	0	0	0
CHD	1	0.6	2	24.4	0	9	0	0
Other	3	1.9	2	2.4	3	2.7	0	0
Still living	149	96.1	80	94.1	100	95.2	1	100
Not located	7	4.3	5	5.5	5	4.6	0	0
Total	162		90		109		1	
(4) Control group for (2):		%		%		%		%
Cancer	1	1	1	2.2	0	0	0	0
CHD	1	1	1	2.2	1	0.9	0	0
Other	1	1	3	6.6	5	4.6	0	0
Still living	94	96.9	40	88.88	98	95.1	3	100
Not located	5	4.9	1	2.1	5	4.6	0	0
Total	102		46		108		3	
(5) Control group for (1 + 2):		%		%		%		%
Cancer	1	0.6	1	0.5	0	0	1	0.9
CHD	2	1.2	2	1.0	1	0.9	0	0
Other	5	2.9	5	2.7	2	1.8	2	1.8
Still living	166	5.4	180	95.7	107	96.4	107	97.3
Not located	13	6.9	9	4.6	10	8.3	6	5.2
Total	187		197		121		116	

were treated for physical diseases, and none would have been diagnosed as suffering from cancer or CHD.

Table 11 shows the numbers of probands of Type 1, 2, 3 and 4 who had been treated by psychoanalysis, and either discontinued treatment or did not do so. Also given are two control groups matched on age, sex, smoking and personality type with the two psychoanalytically treated groups. We also have another (separate) control group for the two psychoanalytic groups combined matched overall on age, sex and smoking, but not on personality type.

Table 12 shows the mortality of the members of the 5 groups. Percentages for Type 4 are not very meaningful considering the small number of cases who died, and will be disregarded. Perhaps the most meaningful figures are those for 'Still living'. Percentages for Types 1, 2 and 3 are 84, and 84 and 84% for those who discontinued psychoanalysis; 74, 70 and 78% for those who continued treatment, and 96, 94 and 95% for control group 1, 97, 89 and 95% for control group 2, and 95, 96 and 96% for control group 3. Altogether, in the discontinuing group 288 are still alive, compared with 329 in the appropriate control group; in the continuing treatment group, 182 are still alive, compared with 232 in the appropriate control group. It is clear that the 'no treatment' group does best, followed by the 'discontinued treatment' group, with the 'continued treatment' group showing the worst prospect. The various control groups show no significant differences from each other, but are very significantly different from the two psychoanalytically treated groups.

A relatively small number of probands had been treated with a variety of non-analytic short-term therapies, varying considerably in the methodology used. (This type of therapy is defined as lasting less than 1 yr.) This group showed a mortality rate not different from an appropriate control group, matched on age, sex, smoking and personality type. Table 13 shows the results. Still living are 93, 92 and 98% in the control group, and 93, 90 and 92% in the therapy group.

Rather than enquire more in detail about the nature of the therapies used, which we do not believe would have given worth-while results, we asked patients some questions regarding the impressions they received as far as greater or less autonomy was concerned. In other words, we wanted to know whether they felt that the therapy they experienced was directed to *increase* or *decrease* their autonomy, using the term as defined in our description of the behaviour therapy system used by us. Points were given according to the answers received to two questions as follows:

(1) I have learned during therapy to create conditions through my own actions which prove satisfying to me in relationships with other people, and internally. Therapy has made me less able to create conditions which prove satisfying to me in relationships with other people, or internally.   (−2)

(2) The therapist has been instrumental in causing me to become more active in producing satisfactory outcomes in my relationships with other people, and in my own internal feelings.   (+3)

In therapy, I have been directed to carry out behaviours which the therapist considers best for improving my mental health, without much interest being shown in my own views and desires.   (−3)

Table 13. Mortality over 9 yr of control and short-term therapy groups

	Type 1		Type 2		Type 3		Type 4	
Short-term therapy:		%		%		%		%
Cancer	6	3.3	3	3.0	5	2.4	0	0
CHD	3	1.7	6	4.0	5	2.4	1	25
Other	4	2.2	5	3.4	8	3.8	0	0
Still living	168	92.8	134	90.5	193	91.5	3	75
Not located	4	2.2	2	1.3	4	1.7	0	0
Total	185		150		215		4	
Control group:		%		%		%		%
Cancer	5	2.8	2	1.4	1	0.5	0	0
CHD	2	1.1	4	2.8	1	0.5	0	0
Other	4	2.2	6	4.0	3	1.5	0	0
Still living	169	93.9	136	91.9	206	97.6	4	100
Not located	5	2.7	2	1.4	4	1.8	0	0
Total	185		150		215		4	

Table 14. Mortality of psychotherapy patients receiving treatment; *increasing* or *decreasing* patient's autonomy

	Type 1		Type 2		Type 3		Type 4	
Increasing autonomy:								
n	32		10		34		1	
		%		%		%		%
Cancer	1	3.2	0	0	0	0	0	0
CHD	1	3.2	1	10	1	3	0	0
Other	1	3.2	1	10	1	3	1	100
Still living	28	90.3	8	80	31	93.9	0	0
Not located	1	3.1	0	0	1	2.9	0	0
Decreasing autonomy:								
n	70		36		74		2	
		%		%		%		%
Cancer	8	12.1	3	8.3	8	11.2	1	50
CHD	7	10.6	5	13.9	7	9.9	1	50
Other	7	10.6	4	11.1	6	8.4	0	0
Still living	44	66.7	24	66.7	50	70.4	0	0
Not located	4	5.7	0	0	3	4.1	0	0

Table 14 shows the results for probands who had been in psychoanalysis for more than 2 yr. It is clear that methods of treatment which *advance* or *increase* personal autonomy lead to *lower* mortality rates than methods judged by the patient to have opposite intentions and results. For the three types in question (Types 1, 2 and 3), the percentage of patients still alive is 90, 80 and 94% in the former group, and 67, 67 and 70% in the latter group, a result highly significant overall.

Similar results are found for the short-term therapy patients for whom data were available. These are shown in Table 15. Numbers are too small to take seriously, other than the percentages still living for Types 1, 2 and 3. These are 97, 97 and 96% for patients who received treatment increasing autonomy, and 86, 75 and 87% for those receiving treatment decreasing autonomy. Again, the figures are highly significant overall by analysis of variance.

A final table may be of some interest, although the numbers are too small to have much significance. We are here dealing with three groups. Group 1 is constituted of patients who broke off psychoanalytical treatment after 2 yr or less, and were then treated with behaviour therapy. Group 2 is a control group matched with the members of group 1 on age, sex, smoking and personality type. Group 3 is a control group which discontinued psychoanalysis, like Group 1, but did not receive behaviour therapy. Members of Group 1 and 2 do not differ significantly in mortality, but Group 3 has significantly greater mortality than either. Looking again at the percentage of patients still living, we find for Group 1 92, 95 and 95%, for Group 2 96, 89 and 95%, for Group 3 the figures are: 72, 63 and 61%. Clearly behaviour therapy can reverse the negative impact psychoanalysis has on survival (see Table 16).

The overall impression given by these studies must surely be that psychoanalysis and other similar psychotherapies have a *negative* influence on survival, as compared with short-term therapies which have little or no influence on survival, while behaviour therapy has a very *positive* influence on survival. Before accepting the evidence concerning the negative influence of

Table 15. Mortality of short-term therapy patients receiving treatment *increasing* or *decreasing* patient's autonomy

	Type 1		Type 2		Type 3		Type 4	
Increasing autonomy:								
n	104		92		113		4	
		%		%		%		%
Cancer	1	0.9	0	0	1	0.9	0	0
CHD	1	0.9	1	1.1	1	0.9	0	0
Other	1	0.9	2	2.2	2	1.8	0	0
Still living	98	97.0	88	96.7	106	96.4	4	100
Not located	3	2.99	1	1.1	3	2.7	0	0
Decreasing autonomy:								
n	81		58		98		2	
		%		%		%		%
Cancer	5	6.3	3	5.3	4	4.1	0	0
CHD	2	2.5	5	8.8	4	4.1	0	0
Other	3	3.75	6	10.5	5	5.2	1	50
Still living	70	86.42	43	75.4	84	86.6	1	50
Not located	1	1.2	1	1.7	1	1.0	0	0

Table 16. Mortality of controls and two groups having discontinued psychoanalysis, one receiving behaviour therapy, the other not

	n	Type	Cancer		CHD		Other causes of death		Still living		Not located	
				%		%		%		%		%
(1) Psychoanalysis discontinued after	26	1	1	3.8	0	0	1	3.8	23	92	1	3.8
2 yr or less, then given autonomy	19	2	0	0	1	5.3	0	0	18	94.7	0	0
training	20	3	0	0	0	0	0	0	19	95	1	5
Control group for (1)	26	1	1	4	0	0	0	0	24	96	1	4
	19	2	1	5.4	1	5.6	0	0	16	88.9	1	5.3
	20	3	0	0	0	0	1	5.3	18	94.7	1	5
Psychoanalysis discontinued	26	1	3	12	2	8	2	8	18	72	1	4
after 2 yr or less	19	2	2	10.5	3	15.9	2	15.8	12	63.1	0	0
	20	3	2	11.1	2	11.1	3	16.7	11	61.1	2	10

psychoanalysis we must consider certain complications. We do not know what caused probands to undergo psychoanalysis; it is possible that these were suffering from neurotic symptoms and debilities which would make them more susceptible to cancer and CHD. We tried to guard against this possibility by matching in terms of smoking (often a sign of neurotic dispair) and personality type, but there can be no certainty that we have succeeded in ruling out the possibility of contamination—the only possible way of deciding the question once and for all is for a prospective study to be done along the lines of our studies 1, 2 and 3, but using psychoanalysis instead of behaviour therapy. Failing such a study, the evidence suggests strongly that psychoanalysis may be a danger to health.

Theoretically, this conclusion is not unreasonable. We have shown that stress is a powerful factor in causing cancer and CHD, and it is widely agreed, even among psychoanalysts, that their treatment imposes a considerable strain on patients. The hope is often expressed that finally the treatment will resolve these strains, but there is no evidence to suggest that this is true (Rachman & Wilson, 1980; Eysenk & Martin, 1987). Indeed, there is good evidence that even in cases of mental disorder psychoanalysis often does considerable harm (Mays & Franks, 1985). A theoretical model to account for these negative outcomes of psychoanalysis and psychotherapy generally has been presented elsewhere (Eysenck, 1985); it would apply equally well in the psychosomatic as in the purely psychiatric field.

DISCUSSION

The results reported in this paper would seem to suggest that creative novation behaviour therapy can be of considerable use prophylactically as far as cancer and CHD are concerned, preventing death from either disease, or at least postponing it for a considerable period, and lowering incidence; further follow-up of the survivors is needed to discover to what extent cancer and CHD have been eliminated *permanently* from the causes of death in our treatment group, or whether there has been only a postponement. Whatever the outcome, behaviour therapy applied as a prophylactic aid in cancer-prone and CHD-prone populations would seem to have an important place in preventive medicine (Eysenck, 1989).

Equally, the results suggest that even when inoperable cancer has been diagnosed, creative novation behaviour therapy can be of considerable use, either by itself or in synergistic co-operation with chemotherapy, in prolonging life. The synergistic effects of behaviour therapy are of particular interest, as chemotherapy by itself cannot be said to have proved its value. A recent analysis of reports in this area concluded: "Even today, after several decades of intensive clinical research into chemical substances assumed to reduce the effects of cancer there is still lacking any evidence, as far as most types of cancer are concerned, that treatment using these substances as treatment for advanced states of cancerous growth has any favourable influence on the patient's life expectancy ...(Reports of successful treatment are misleading). They are as a rule based on erroneous conclusions based on inadequate data" (Abel, 1989, p. 1). This analysis is based on a survey of some 250 studies, and constitutes in effect a meta-analysis of modern work in this area. (See also Feinstein, Sorin & Wells, 1985, on the misleading use of statistics in this field.)

In the light of this dismissal of current medical methods of treatment, the results of behavioural techniques may seem almost miraculous. Yet there is evidence from independent sources that even

quite simple manipulations of behaviour in terminal cancer patients may have very marked results as far as survival is concerned. Thus Spiegel *et al.* (1989) have shown that a group of women with cancer of the breast who received minimal group therapy and lessons in self-hypnosis lived on average about twice as long as a similar group who were only given traditional medical treatment (36.6 compared to 18.9 months). This study which covered 10 yr, involved 86 middle-aged women diagnosed as suffering from breast cancer who had been receiving similar treatment. These results, achieved by an author who had not expected any positive results at all, are even more spectacular than ours, and confirm the possibilities inherent in the methodology of behavioural intervention.

As regards prevention of disease, here also the evidence that intervention along the usual lines advocated by physicians has strong positive results is absent or contradictory (Eysenck, 1986; McCormick & Skrabanek, 1988), while that regarding psychological stress management techniques is much more positive, although not conclusive (Grossarth-Maticek *et al.*, 1984; Johnston, 1989). The expense and general difficulty of conducting long-term follow-up studies with treatment and control groups have discouraged research in this field, and have encouraged unsubstantiated beliefs in the magical effects of giving up smoking, beliefs which are disproved by actual empirical investigations (Eysenck, 1986, 1991). In the face of a considerable body of evidence, the refusal of the medical profession to consider seriously the effects of psychological interventions is difficult to understand (Hager, 1986; Pohler, 1989).

It is not suggested that the method of treatment here described is necessarily superior to, or indeed very different from, methods of stress management and reduction in widespread use at the moment by behaviour therapists generally. The difficulties of specifying precisely the nature of intervention when every case differs from every other are well known, and exaggerated claims for one method over another, probably quite similar method, are clearly inadmissible, and no such claims are intended. All that is being stated is that using the strategy and tactics outlined in these two papers, successful results have been achieved, both for prophylaxis and for prolongation of life. The Spiegel study has shown that similar effects can be achieved using other (not dissimilar) methods. It must remain for future research to discover more precisely the most effective elements in the methods used, for particular types of probands or patients, and for specific diseases. This is of course a major and very difficult problem, but one which will require tackling. Cancer and coronary heart disease are the major killers among diseases nowadays, and any intervention technique which promises prevention on the scale suggested by our findings would seem worthy of replication and extension.

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