

THE CAUSES AND CURES OF PREJUDICE: AN EMPIRICAL STUDY OF THE FRUSTRATION-AGGRESSION HYPOTHESIS

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Summary—In this study, 6796 males aged between 45 and 55 years were interviewed and asked questions concerning eight possible objects of prejudice, and given a series of questions concerning their attribution to one of four personality types. It was shown that all sources of prejudice correlated positively together, and that each was related in a similar manner to personality. Attempts to change personality through a type of cognitive behaviour therapy led to significant changes in prejudice.

INTRODUCTION

Following Allport's (1954) influential book on Prejudice, there has arisen a large literature on prejudice and ethnocentrism suggesting that the different types of racial, national and religious prejudice are related together (Ray and Lovejoy, 1986; Bierly, 1985), and can be found in the toughminded sector of the social attitudes space (Eysenck, 1944, 1950, 1951, 1954). There is evidence that such prejudice is in large part genetically determined (Eaves and Eysenck, 1974; Eaves, Eysenck and Martin, 1989; Martin, Eaves, Heath, Jardine, Feingold and Eysenck, 1986; Martin and Jardine, 1986). There is also evidence that such attitudes are related to personality (Eysenck, 1961; Eysenck and Coulter, 1972). In this last study, prejudice was found to be part of "toughmindedness", and to be related to aggressive behaviour and attitudes. Eysenck and Wilson (1978) have reviewed some of the more recent literature; as have Wilson (1973), Oskamp (1977) and Pettigrew, Fredrickson, Knobel, Glazer and Veda (1980).

Among the personality variables studied are self-esteem (Bagley, Verma and Mallick, 1981), locus of control (Duckitt, 1984), repression-sensitisation, (Chesan, Stricker and Fry, 1970); punitiveness (Snortum and Ashear, 1972), adjustment (Sharan and Karan, 1974; Duckitt, 1985), as well as a variety of other personality characteristics (Chabassol, 1970; Heaven, 1976; Hesselbart and Schuman, 1976; Maykovich, 1975; Sinha and Hassan, 1975; Sarma, 1973; Serum and Myers, 1970; and many others). Krech, Crutchfield and Ballachey (1962) summarize a number of studies by stating: "Racial prejudice is often found among the mentally ill" (p. 182).

Another source of prejudice and ethnocentrism has been suggested in the literature, namely weak socio-economic position, uncertainty about future employment and earnings, and other similar aspects of social alienation and insecurity (Oskamp, 1977; Pettigrew *et al.*, 1980). Connected with these hypotheses is Campbell's view that aggression induced by frustration may be a powerful influence in racial prejudice towards the Jews (Campbell, 1947).

There have also been many suggestions as to how prejudicial attitudes might be altered, and how prejudice might be reduced (e.g. Katz and Zalk, 1978; Griffit and Garcia, 1979; Langer, Bashner and Chamowitz, 1985). Interracial contact has been a favourite in this connection (e.g. Foley, 1977; Moore, Hauck and Donne, 1984); however, as Ford (1986) has shown, favourable intergroup contact may not always reduce prejudice. Certainly the evidence on the whole is inconclusive.

Prejudice, analysed along sociobiological lines, would seem to be the inevitable effect of group formation (Eibl-Eibesfeldt, 1986), i.e. the universal tendency of human beings to organize themselves in tribal or national units. These units are normally in competition with each other and hence there is a certain amount of enmity between them. When differences between groups become emphasized through racial characteristics, enmity and prejudice would seem to be magnified through easy recognizability of the differences between the groups. Prejudice would thus seem to have a biological, evolutionary root which may account for the strong degree of heritability which Eaves and Eysenck, (1974); Eaves *et al.* (1989) have discovered. These innate dispositions of course

require activation through environmental circumstances, one of which, as we shall show, is personal insecurity in the socio-economic field. As Eysenck (1980) has argued, the socio-biological approach stands on two feet, one of which is the evolutionary, the other the behavioural genetic. In the case of prejudice both seem to be well substantiated in the literature. (Rushton, 1985, 1986; Rushton, Fulker, Neale, Nias and Eysenck, 1986.)

The present study addresses all the problems raised by past research in these areas. The major questions are:

- (1) To what extent do the major sources of prejudice in our society correlate together, and do they form a general factor of prejudice?
- (2) Is this hypothetical factor of prejudice related to personality?
- (3) To what extent is this factor of prejudice related to social insecurity?
- (4) Are personality and social insecurity independent factors in causing prejudice?
- (5) To what extent is it possible to change personality, such that prejudice is diminished?

These are important social questions, particularly the last, and a large-scale study to give fairly definitive answers to them seemed desirable. The theory on which our experiment is based will be discussed in a later section; it derives essentially from the frustration-aggression hypothesis.

DESIGN OF THE EXPERIMENT

(a) Subjects of the experiment were 6796 males, aged from 45 to 55, interviewed and tested in the years from 1972 to 1983. Every year between 400 and 800 persons were interviewed, constituting a representative sample of the German town of Heidelberg between the ages of 45 and 55. An additional 3625 persons refused to take part in the study. Interviewers were specially trained students who had taken part in similar studies concerned with stress and physical health (Grossarth-Maticek, Eysenck and Vetter, 1988; Eysenck, 1987a, b).

(b) Attitudes towards possible sources of prejudice were obtained by means of an eight-point questionnaire, to be answered 'Yes' or 'No', which is reproduced as Table 1. The questions were intentionally put in a rather extreme manner, in order to obtain extreme judgements of prejudice. An additional 12 neutral questions relating to political and social problems were intermixed with the 8 questions in Table 1, in order to make the intention of the questionnaire less obvious; these are irrelevant buffer items, and have not been analysed.

(c) One question was put to ascertain the socioeconomic status and attitudes towards security-insecurity of the persons interviewed. The question was as follows:

"Looking at the last three years of life, do you find an increasing deterioration of your material situation and your social position, so that in comparison with earlier years you are becoming poorer and less integrated?"

Table 1. Eight questions constituting the Political Prejudice Inventory

Inventory to assess social and political prejudice
1. In the leading industrial countries of the West, is Parliamentary Democracy the major cause of the cultural deterioration and the accumulation of more and more unsolvable problems which are leading to the destruction of civilization altogether?
2. Would you agree that International Jewry carries the main responsibility for the growing number of crises and misunderstandings in the industrialized countries of the West, so that one might perhaps have to say that Hitler was not all that wrong in his judgment of the Jews?
3. Do the Arabs constitute the greatest threat to peace in Western Industrial society, because with their aggressive religion and their malicious mentality they intend to destroy Western culture?
4. Do the Slavs constitute the greatest threat to peace in the Western World because with their panslavistic attitudes they want to subjugate Germanic and Romanic countries and force upon the Western World an inferior culture?
5. Would you say that the Christian religion is a major cause of the difficulties and troubles to be found in the Western Industrial countries?
6. Do you believe that different races are so different in their abilities and qualities that it would be perfectly justified and desirable to speak of superior and inferior races?
7. Is the behaviour of the United States in the whole world one of the major causes of misunderstandings, crises and unsolvable problems?
8. Is the Communist ideology and practice such a cause of misunderstandings and crises in the whole world that we would be justified in trying to destroy communist governments and communist movements by force?

(d) Subjects of the experiment were also given a detailed questionnaire to determine to what extent they belonged to one of four major types of personality previously studied in relation to physical health, particularly cancer and coronary heart disease. These types have been described in considerable detail elsewhere (Grossarth-Maticek, Vetter and Eysenck, 1988). Essentially, they relate to ways and means of reacting to interpersonal stress. Thus Type 1 idealizes and is dependent upon persons (husbands or wives, father or mother etc.) whose removal or rejection causes stress with which the individual cannot cope. Type 2 attempts to distance itself from persons or objects of high emotional significance which he regards as sources of his unhappiness and dissatisfaction because of their refusal to fall in with his or her wishes and desires. Type 2 reacts with anger and hostility to stresses of this kind, due to his failure to succeed in thus distancing himself. Type 3 is equally dependent on important persons, but reacts with ambivalence, sometimes idealizing these objects, sometimes hating them. Type 4, on the other hand, is largely autonomous in his behaviour, i.e. such a person reacts more realistically to the withdrawal or negative attitudes of important persons. The questionnaires used to define and measure these personality types have been published elsewhere (Grossarth-Maticek, Vetter and Eysenck, 1988), as has evidence of the strong relations between these four types and physical health. Thus it has been found that Type 1 is cancer-prone, Type 2 heart disease-prone, whereas Types 3 and 4 are relatively protected from these diseases. Unpublished work by P. Schmitz has shown that Types 1, 2 and 3 are high on neuroticism, whereas Type 4 is low on neuroticism. Theoretically, therefore, one might expect prejudice, as an expression of irrational emotional reaction and frustration, to be associated with Types 1, 2 and 3 but not with Type 4.

RESULTS

(a) Personality

Table 2 shows the number of persons of Types 1, 2, 3 and 4 who answer positively any of the 8 items relating to prejudice, and who felt socioeconomically uncertain. The average ages for the persons belonging to each of the four types showed no significant differences (mean age = 51 years).

Socioeconomic uncertainty is significantly more frequently found among Types 1, 2 and 3 than in Type 4. Political prejudice is clearly almost absent among persons of Type 4, most frequent among persons of Types 2 and 3, and intermediate among persons of Type 1.

These relations become more apparent when treated as percentages. Of Type 1, 36% answer at least one question in the prejudiced direction. Of Type 2, 65% do so; of Type 3, 45% and of Type 4 less than a third of 1%. Thus Type 2 is the most prejudiced, followed by Type 3, then Type 1, with Type 4 being almost free of prejudice.

There is some patterning to the relationships between prejudice and personality. There appears to be a suggestion that Type 1 is particularly characterized by anti-Arab and anti-Christian attitudes, and relatively little by anti-American attitudes. Type 3, on the other hand, shows little anti-Arab or anti-Slav prejudice. While these results, like all the others mentioned are fully significant statistically, they were not predicted, and would require replication before being taken too seriously.

Table 3 shows the relationship between type and prejudice, this time using persons and not judgements indicative of prejudice as the variables plotted. In other words, any person showing

Table 2. Numbers of subjects agreeing with each of the 8 prejudice statements, sub-divided according to personality type. Also given are numbers showing socio-economic insecurity

Political prejudice:	Type 1	Type 2	Type 3	Type 4
1. Anti-democratic attitude	52	121	195	15
2. Anti-Semitic attitude	81	165	103	10
3. Anti-Arab attitude	75	76	54	6
4. Anti-Slav attitude	51	148	37	2
5. Anti-Christian attitude	77	48	67	1
6. Anti-racist attitude	88	157	105	2
7. Anti-American attitude	40	194	213	3
8. Anti-communist attitude	105	207	121	5
Total:	1590	1720	1970	1516
Socio-economic uncertainty	268	351	312	201
Average age	52.1	50.5	48.1	49.4

Table 3. Relationship between typology and prejudice

	Type 1	Type 2	Type 3	Type 4	Total
Any prejudice	281	401	384	21	
Total:		1066		21	1087
No prejudice	1309	1319	1548	1495	
Total:		4212		1495	5707
χ^2 : $P < 0.001$				Total:	6794

even one prejudice is counted as prejudiced, demonstrating that approximately one person in five is prejudiced according to this differentiation. Chi square shows the significance of these results.

Table 4 shows the intercorrelations (phi coefficients) between the 8 types of prejudice. It will be seen that the Table constitutes a positive manifold; there are no negative correlations. Some are quite low, such as that between anti-Semitic and anti-Arab attitudes (0.14); one might have thought that this correlation would turn out to be negative, but this was not so. Others are very high, such as that between anti-democratic and anti-American attitudes (0.79), or that between anti-democratic and anti-Semitic attitudes (0.65). The pattern of correlations is not very different from what one might have expected, although the absence of any negative correlations may be surprising. The Table demonstrates very clearly the prominence of a generalized prejudicial type of reaction, characteristic of certain types of individual.

The components of this matrix were identified using principal component analysis. The 8th eigenvalue was negative (-0.0812). This indicates that the correlation matrix is singular and of rank less than 8 (unities were used in the diagonal of the matrix). The reasons for this ill-conditioned matrix may be connected with rounding errors in the correlations and/or the heavily skewed variable distributions over which the Pearson product-moment correlations were computed. Given the low level of overdetermination of the initial eigenvalues (by 0.0812 spread across the 7 positive eigenvalues), it was decided to proceed with further examination of the component solution. For reference purposes, the eight component eigenvalues are given in Table 5.

The first two components were rotated, using hyperplane maximized direct oblimin rotation, with the delta parameter swept from -40.5 to 0.5 in steps of 1.00 . The hyperplane width was 0.1 . Maximal simple structure was determined at -0.5 , with a hyperplane count of 4. This low hyperplane count reflects the indication that the first component may be considered a general factor (the lowest unrotated loading on this component is 0.55 .) However, the second unrotated component contained 4 loadings above 0.3 , with the anti-Arab value at 0.77 . The rotated component loadings are given in Table 6.

Component 1 is best explained as a general factor of prejudice, with only anti-Arab prejudice having a very slight negative loading. Component 2 contrasts essentially anti-Semitic and anti-American versus anti-Christian, anti-Arab and generally racist feelings. This factor reflects the differentiation between Type 1, showing little prejudice against Americans and against Jews, and Type 2, showing strong prejudice against both. On the other hand, Type 1 shows particularly strong prejudice against Arabs and Christians. The meaning of this factor, or its relation to the difference between Type 1 and Type 2, is not clear. America is often seen as the main ally of Israel, so that the connection between anti-semitism and anti-Americanism is intelligible. Why anti-Arab sentiment should go with anti-Christian sentiment, however, is not clear, unless this is seen as an anti-religious factor, with Arabs standing for the Islamic religion.

Table 4. Intercorrelations (phi) between 8 prejudiced attitudes

Prejudice	1	2	3	4	5	6	7	8
1	—	0.65	0.31	0.44	0.41	0.55	0.79	0.40
2	0.65	—	0.14	0.66	0.43	0.81	0.71	0.73
3	0.31	0.14	—	0.45	0.41	0.67	0.19	0.28
4	0.44	0.66	0.45	—	0.30	0.48	0.39	0.61
5	0.41	0.43	0.41	0.30	—	0.51	0.37	0.22
6	0.55	0.81	0.67	0.48	0.51	—	0.53	0.43
7	0.79	0.71	0.19	0.39	0.37	0.53	—	0.34
8	0.40	0.73	0.28	0.61	0.22	0.43	0.34	—

Table 5. Eigenvalues and percentage variance of factored matrix

Component	Eigen value	Percentage variance explained
1	4.3870	54.8375
2	1.1359	14.1993
3	0.9774	12.2181
4	0.5885	7.3557
5	0.4618	5.7723
6	0.3447	4.3086
7	0.1859	2.3236
8	-0.0812	-1.0150

Table 6. Rotated component loadings of matrix

	Component 1	Component 2
Anti-Democratic	0.81	0.02
Anti-Semitic	0.98	-0.05
Anti-Arab	-0.06	0.96
Anti-Slav	0.60	0.26
Anti-Christian	0.25	0.57
Racist	0.52	0.56
Anti-American	0.87	-0.13
Anti-Communist	0.71	0.01

The factor intercorrelation is 0.37.

The assumption of linearity was relaxed with regard to item dimensional representation. Using the Guttman-Lingoes smallest space analysis (SSA) as implemented within the SYSTAT package, minimizing the Guttman's coefficient of alienation, and SSA minimizing Kruskal's Stress statistic, with spatial separation indicated by Euclidean distances, two 2-dimensional solutions were computed. For the Guttman SSA, alienation was 0.14, for the Kruskal SSA, stress was 0.09. Both these values are indicative of good fit between the derived distances and initial similarity matrix.

Figure 1 provides the configuration plot for the Kruskal solution. Note that the pattern of variables is very suggestive of a circumplex, with the central pole at the variable "Racist". Table 7 gives the coordinates of the variables.

(b) Socioeconomic uncertainty and prejudice

Table 8 shows the relationship between socioeconomic insecurity and our personality typology. There is a significant relationship between insecurity and types 1, 2 and 3, and security and type 4. Chi square is fully significant for this differentiation.

Table 9 shows the relationship between prejudice and socioeconomic insecurity; it is clear that there is a very significant relationship in the sense that socioeconomic insecurity is related to high prejudice. Clearly personality and socioeconomic insecurity contribute jointly and severally to political prejudice.

The data in Table 9 were submitted to a log-linear analysis (Everitt, 1977), specifically testing the interaction between personality type and socioeconomic security. The underlying distribution of the data was assumed to be multinomial, with significance testing implemented via the χ^2

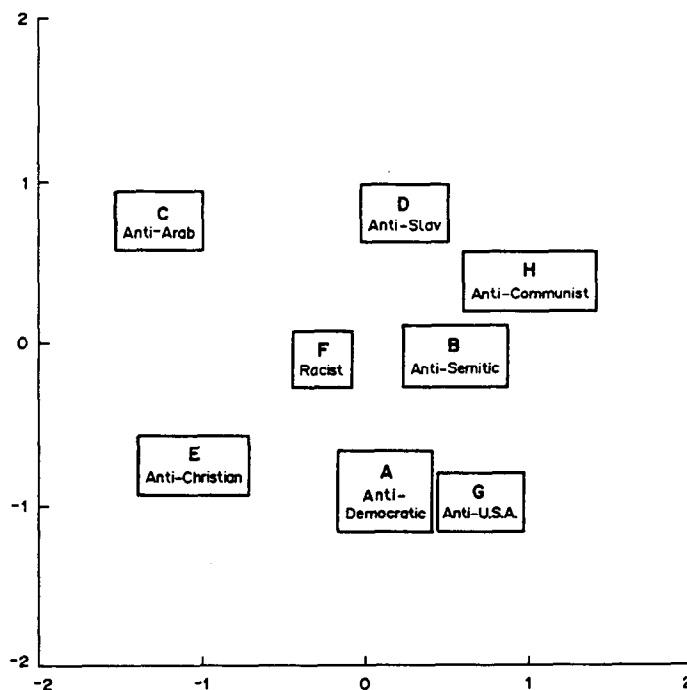


Fig. 1. Smallest space analysis of relations between 8 prejudices.

	Prejudice: Any				Prejudice: No			
Types:	1	2	3	4	1	2	3	4
Socioeconomic security:	91	100	134	4	1231	1269	1524	1311
Total:	329				5335			
Socioeconomic insecurity:	190	301	250	5	78	50	62	196
Total:	746				386			

$\chi^2: P < 0.01$

Table 10. Change of prejudice in control and therapy groups

	Group without any prejudice	
	Therapy	Control
Prior to treatment	0	0
Six months later	124	1
One year later	153	2
Two years later	179	0

Table 11. Decline in anti-Semitic prejudice over two years in therapy groups

	Anti-Semitic	
	Therapy group	Control group
Prior to treatment	169	163
Six months later	101	165
One year later	67	168
Two years later	51	164

Type 1 and 2 (Eysenck, 1987b, in press; Grossarth-Maticek and Eysenck, 1989) suggests that the treatment may indeed be successful in partly at least removing frustration through improving coping behaviour.

People showing at least one political prejudice in the questionnaire were divided on a random basis into a control group and a therapy group, each consisting of 265 persons. Pairs were formed on an age basis, and one member was randomly assigned to the treatment group, the other to the control group. Pairs were also equated for type of prejudice; in other words, both were anti-Semitic, or whatever. Training was given to groups of 20–30 persons at a time, and lasted altogether between 20 and 25 hr. Roughly speaking the training consisted of 5 hr theory, regarding the differences between autonomous and dependent behaviour, self-regulation, etc. Ten hours were spent on the identification of object dependence in individuals, and the discovery of alternative behaviour patterns which should be aimed at in order to avoid such object dependence. The last 10 hr were spent on formulating precise aims for each person, suggesting coping mechanisms, and dealing with general and specific methods of attaining the person's aims. A more detailed description of the methods and aims of the cognitive behaviour therapy employed is given in the references above. After this training was completed, the prejudice questionnaire was repeatedly applied to these groups after six months, one year and two years from the completion of the training. It should be noted that both in the therapy group and the control group there are 55 persons of Type 1, 100 persons of Type 2, and 110 persons of Type 3.

It is important to note that the therapy training was offered in the course of an investigation into the possibility of using such training as a prophylactic measure against cancer and coronary heart disease (Eysenck, 1987a, b); it was not given as a "cure" for racist prejudice, and indeed during the training political and social attitudes were never mentioned. Thus therapy was offered as an aid to physical health, and it was accepted or rejected *exclusively* on this basis. Of the 440 pairs originally approached, 175 refused to take part in the training; a pair was excluded from the experiment if one of the two refused participation.

Table 10 shows the main results. It will be seen that at the beginning of the therapy none of the 265 persons in either group was without at least one political prejudice but, say, two years after

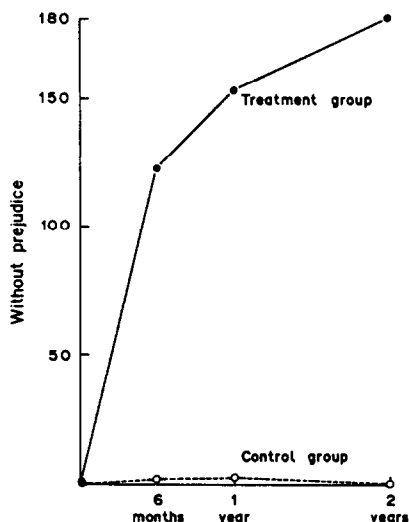


Fig. 2. Increase of "without prejudice" number of persons in treatment group, as compared with controls.

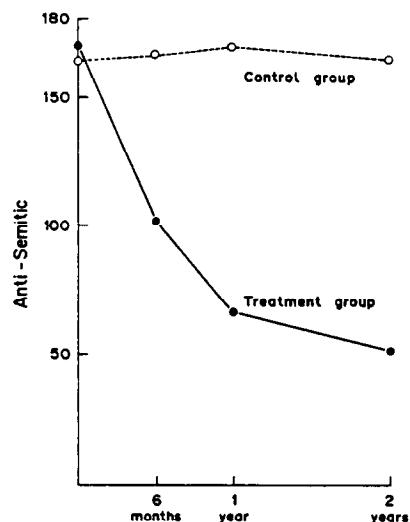


Fig. 3. Decline of anti-Semitism in treatment group, as compared with controls.

the training, 179 people in the trained group did not have any political prejudice, while in the control group, all 265 persons still showed at least one political prejudice. In other words, there was no change in the control group, but a very marked one in the therapy group. See also Fig. 2.

In Table 11 are given the number of persons showing anti-Semitism. Before the training there was no significant difference between the two groups, but while the control group does not show any change over the next two years, the therapy group shows a very significant reduction of about 70% in anti-Semitic prejudice. See also Fig. 3.

THEORETICAL BASIS OF PERSONALITY-PREJUDICE RELATION

The theories on which our work has been based may be traced back ultimately to the frustration-aggression hypothesis originally suggested by Dollard, Doob, Miller, Mowrer and Sears (1939), who proposed that *frustration always leads to aggression, and that aggression is always the result of frustration*. Research has demonstrated that frustration does not always lead to aggression, but may cause alternative reactions like depression (Seligman, 1975). Similarly, aggression is not always the result of frustration, but may have other causes. The theory was modified and revised by Berkowitz (1962, 1969, 1979), suggesting that frustration leads to anger, not aggression. However, anger can easily instigate aggression if suitable aggressive cues exist, including for instance pain or frustrative non-reward, the presence of guns, swords or other arms, etc.

There is a clear connection between neuroticism and aggression (e.g. Hernandez and Mauger, 1980; Eysenck and Eysenck, 1985), presumably in part due to the frustrations experienced by neurotics because of their inability to adjust. As already pointed out, Types 1, 2 and 3 are characterized by neuroticism as a personality variable, thus suggesting that this may be a powerful instigator of anger and aggression in them (particularly Types 2 and 3—see Eysenck, 1989). This hypothetical relationship between neuroticism, anger-aggression, and prejudice has already been noted, among others, by Duckitt (1985), Krech, Crutchfield and Ballachey (1962), Sharan and Karan (1974) and Snortum and Ashear (1972), and it would seem to account for at least some of the observed relationships.

Individuals of Types 1, 2 and 3 are not only high on neuroticism; they are also differentiated from individuals of Type 4 by suffering from strong emotional stress, due to interpersonal relationships of an unsatisfactory kind with which they cannot cope. Thus these groups are specially selected for being in a frustrating situation, and hence it is not unreasonable to expect them to demonstrate anger and aggressiveness particularly strongly. One direction which this expression of anger and aggressiveness may take is of course that of prejudice, i.e. dislike or hatred of other groups, whether differentiated along racial, national, or religious lines. This may be regarded as a kind of *displacement* of hostility, produced by the difficulty of expressing anger-hate-aggressiveness against the people properly responsible for the frustration suffered.

In so far as the cognitive behaviour therapy used in this study is explicitly designed to teach the individual to cope with the stresses to which he is exposed, make him alter the circumstances in such a way as to produce less frustration, and achieve a certain degree of autonomy, we would expect on theoretical grounds that by this reduction of frustration, we would also achieve a reduction of the anger-aggression originally produced by the frustration. In this sense we might say that our intervention study provides some evidence for the *causal* relationship between personality and prejudice, which without it might be regarded as simply a statistical correlation. By experimentally manipulating the independent variable, and demonstrating a predicted effect on the dependent variable, we make more acceptable the proposition that we are dealing with a strictly causal relationship. In this sense the intervention study has theoretical as well as practical implications.

Theories in psychology are of course less predictive, and less easily tested in a quantifiable manner, than are theories in physics. Just as aggression is not only produced by frustration, but may have many other causes, so does prejudice presumably have causes other than the frustration suffered by certain personality types in interpersonal relations. It may be an indirect indication of the complexity of the situation that in Tables 10 and 11 we find that our therapy has not succeeded

in altering the prejudices of quite a sizeable number of our subjects. This suggests the possibility that either their prejudices had other causes than those postulated in our theory, or that they were too firmly grounded to be shifted by the therapy involved. It is impossible on the basis of our work to decide between these two hypotheses. However that may be, the data do furnish some evidence in favour of the special version of the frustration-aggression hypothesis adopted here.

DISCUSSION

The very large number of subjects used would guarantee the statistical significance of almost any findings, but note that the observed differences are not just statistically significant, but so large as to be of considerable social importance. The data seem to demonstrate that in Germany at least there is a general tendency in some people to embrace prejudiced opinions directed against *all* foreign groups (ethnocentrism), even when these groups themselves are opposed to each other. This suggests the well known phenomenon of: "a plague on both your houses", i.e. a tendency to condemn equally two opposing factions. This finding strongly confirms Eysenck's (1954) demonstration that prejudice is related to several different types of attitudes (anti-semitism, anti-black and anti-religion), and that prejudice assumes an important position with respect to the conservative-radical, tough-tenderminded set of coordinates.

Our results may also be looked at from the point of view of the concept of authoritarianism (Adorno, Frenkel-Brunswick, Levinson and Sanford, 1950). As is well known, they dealt almost entirely with right-wing authoritarianism, neglecting the left-wing authoritarianism which had originally been emphasized by Jaensch (1938). As Eysenck (1954), Wilson (1973), and Wilson, Dennis and Wadsworth (1976) have made clear, there is an authoritarianism of the left as well as of the right, and Eysenck and Coulter (1972) have shown that both share a similar personality structure, not unlike that discovered in the present study. In so far as the description of the authoritarian personality by Adorno *et al.* (1950) is approximately correct (and there have been many criticisms of their methodology and the statistical analysis of their data), it should apply not only to right-wing authoritarians, but also to left-wing authoritarians. In so far as our personality description resembles in any way that of Adorno *et al.*, this would appear to be borne out by the results. Eysenck and Wilson (1978) discuss in some detail the relationship between authoritarianism and the two-factor model of social attitudes adumbrated by Eysenck (1954).

The second important discovery in this investigation is the fact that there is a strong relationship between prejudice and personality, normal unstressed people showing very little prejudice overall. Third, there is a strong connection between prejudice and socioeconomic alienation, with the more insecure, alienated subjects showing more prejudice than the socioeconomically secure. Fourth, there appears to be a *synergistic* relationship between personality and socioeconomic alienation. The data seem quite clear-cut on all the points, and the relationship is sufficiently close to demand recognition.

Finally, a fifth important discovery is that it is possible to *alter* behaviour characteristics of personality Types 1, 2 and 3 in the direction of personality Type 4, sufficiently to *decrease prejudice drastically and very significantly*. The result corresponds, in the social field, to the demonstration that similar methods of cognitive behaviour therapy have been found very useful as prophylactic measures for cancer-prone and coronary heart disease-prone persons who showed much higher survival than control groups not given this training (Eysenck, 1987). The social importance of this finding may be considerable, although of course its application in practical terms must be presently regarded as Utopian.

The clear-cut results of this study demonstrate the importance of certain methodological principles in this field which are usually more honoured in the breach than the observance. In the first place, large numbers should be employed in order to avoid the usual reliance on statistical significance tests. With groups as large as those used here, such tests are hardly necessary in order to demonstrate the importance of the differences observed, and the groups can be subdivided to a degree which is impossible with small groups.

In the second place, the study demonstrates the desirability of using non-student samples of sufficient maturity to have experienced different types of stress, to have developed specific ways of dealing with this stress (coping strategies) and whose social attitudes are firmly developed. Student

samples may be of interest in developing and testing hypotheses, but for results applicable to the population at large they may not be the best type of sample to study.

Another methodological point which seems to us to be of the utmost importance is the inclusion of an intervention design. As is well known, a correlation does not necessarily imply causation; causation can only be inferred on the basis of the actual manipulation of some of the correlated variables (independent variables according to theory). This was done here by treating Types 1, 2 and 3 in terms of a proven method of cognitive behaviour therapy, and the results indicated that it is possible to predict the effect of such an intervention, thus suggesting a causal rather than a merely correlational relationship between the variables in question.

One objection to our methodology which demands an answer is related to the fact that all the eight prejudice questions were worded in such a way that a "Yes" answer would indicate prejudice. This raises the possibility that the positive correlations between the eight questions might in part be produced by a yea-saying tendency in the subjects. That this is unlikely is indicated by a study by Eysenck and Crown (1949) in which an anti-Semitism questionnaire containing 24 items was analysed by means of factor analysis and scalogram analysis. The items were worded both positively and negatively, so that any yea-saying response tendencies should have produced a separate factor additional to the general factor of anti-Semitism which accounted for 48% of the total variance; none of the other factors extracted accounted for more than 5%. None of the other factors, in fact, showed a pattern which might reflect positive response tendencies, and the scalogram analysis showed an 85% reproducibility, which is very high for this type of scale, and shows little evidence for any positive response tendencies.

It might of course have been advisable to have phrased some of the questions in the opposite sense, but this is difficult and rather unnatural, and would certainly have seemed very odd to the not particularly well educated subjects taking part in the experiment. Nevertheless, in future work it might be useful to have two wordings for each prejudice, one positive and one negative, in order to test this hypothesis more thoroughly.

It may be asked how it is possible, if there is a strong genetic determination of personality and prejudice, that intervention had such marked effects (Eaves and Eysenck, 1974). Such a question indicates a very widespread misunderstanding of what is meant by heritability in modern behavioural genetics. Heritability is a population statistic, indicating the degree to which the phenotype in question is determined by genetic and environmental factors respectively, how strong the various genetic factors (additive variance, epistasis, dominance, assortative mating) are, and how important the various environmental influences (e.g. within family variance as opposed to between family variance) are within a given population. If we introduce an entirely novel procedure into a population, such as in our case cognitive behaviour therapy, then this may completely alter the importance and influence of environmental factors. Thus there is no problem here as far as the contribution of genetic and environmental determinants is concerned.

As a final comment, let us note that the study was done in Germany, and that it does not necessarily follow that similar studies done in other countries, looking back on a rather different history both pre- and post-war, would show identical results. There is a good deal of similarity where comparisons can be made between these studies and those done in the United Kingdom and the United States, as already pointed out, but it would seem desirable that a proper replication of this study, employing large numbers of subjects randomly selected in the given age and sex group, should be conducted in order to confirm or disconfirm the results here reported.

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