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Scores on Three Personality Variables as a Function of Age, Sex and Social Class

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An inventory containing 20 extraversion (E), 20 neuroticism (N) and 20 psychoticism (P) questions was administered to 1423 adult males, and 968 females, as well as to 1400 students of both sexes and to 327 housewives. Analysis by age, sex and social class showed that young people are high on E, high on N and high on P; that males are high on E, high on P, and low on N; and that middle-class people are low on E, low on N, and low on P. Results were compared with previous findings, and with expectations from epidemiological research.

In two recent papers, Eysenck & Eysenck (1968*a*, *b*) have introduced a set of inventory questions for the measurement of the P (psychoticism) dimension of personality, to take its place beside the well-established dimensions of E (extraversion) and N (neuroticism). Factor-analyses of the questions used disclosed fairly clear-cut E, N and P factors, and three 20-item scales were constructed for their measurement and found to possess reasonable internal reliability for experimental use. This PEN inventory has been administered to various clinical groups, i.e. psychotics and neurotics, as well as to other groups, such as criminals, V.D. patients and drug-takers; in this paper we shall make an attempt to relate the scores of normal respondents on the three scales to factors such as age, sex and social class which are often neglected in dealing with personality. Such knowledge as we possess relates almost entirely to E and N. It would appear that E decreases with age, is not related strongly to social class, and is higher in males than in females. N also decreases with age, is slightly higher in the lower social strata, and is higher in females than in males (S. B. G. Eysenck, 1960; Eysenck, 1956; Eysenck & Eysenck, 1964; Eysenck, 1958). It should be noted that the samples used in most of these studies were not representative, so that sampling errors might have accounted for some of the observed differences. This does not seem a likely hypothesis, because of the random nature of the selection process, but the possibility must be borne in mind. Its plausibility recedes as successive samples, chosen from different groups, show similar relations.

With respect to P nothing is known, but we may form certain vague expectations based on the hypothesis that this factor will bear a similar relation to external factors as does clinically diagnosed pyschosis. Thus it is known that the prevalence of schizophrenia is eight times higher in the lower social classes than in the upper; this suggests that there may be a negative correlation between P and social class (Hollingshead & Redlich, 1958). This expectation disregards the possibly direct relation between social class and manic-depressive disorder, for the simple reason that the schizophrenias are much more widespread than other functional psychotic disorders, and thus make up the larger part of a psychotic population. As regards sex our expectation might be that males would show higher P scores than females; the evidence suggests that age-adjusted first admission rates to public mental

hospitals in the U.S.A. are some 20 per cent higher for men than for women (Kramer *et al.*, 1961). Age is difficult to prognosticate for; schizophrenia is often said to occur in the young, manic-depressive disorder in late middle age. It is thus barely possible that there might be a U-shaped relation between age and P, but this would depend on so many additional assumptions that even less confidence is felt in such a prediction than in those preceding it. All in all the hypothetico-deductive method is more appropriate in studies where at least some well-documented knowledge already exists; in this field we are only just at the beginning of serious study of the incidence of P in normal populations, and extrapolations of the not very secure knowledge of correlates of psychotic behaviour in clinical groups cannot be a very safe guide to prediction.

METHOD

We have already described in our previous papers (Eysenck & Eysenck, 1968*a*, *b*) the methods used to collect several thousand respondents for the PEN inventory. Several of the groups used constituted in fact close approximations to random samples of the population; these groups had been assembled by a market-research firm for other purposes. The remainder were collected in a relatively haphazard manner from a great variety of sources; this random type of selection does not make it likely that any strong source of specific selectivity would have crept in to vitiate our data. Subjects did not write their names, as it was thought that anonymity would be more likely to produce undissimulated answers, but they were asked to fill in their sex, age and occupation. Housewives and students were not made part of the main analysis as their social status could not be ascertained. All other respondents who gave classifiable data were graded according to the Field Manual, Part 2, 'Classification Definitions and Social Grading', of Research Services Ltd. This specifies five main groups: (1) upper middle-class; (2) middle-class; (3) lower middle-class; (4) skilled working-class; (5) semi-skilled and unskilled working-class. (A sixth group, referring to those at the lowest level of subsistence, was not included in our analysis.) We have in the above substituted numbers for the letter classification used by Research Services; this seems more suitable for our purposes, and does not of course make any difference to the results. For detailed discussion and definition of the grades used, the Manual should be consulted. In view of the relatively small number of respondents in class 1 this was combined with class 2, thus reducing the number of classes to four. The reliability and validity of the class score is probably not as high as might be desired, for obvious reasons; this factor would attenuate differences reported below, which might be much larger had a more valid score been available.

RESULTS

Table 1 gives the results by sex, age and social class for the extraversion scores. The original six age-groups, shown on the left-hand margin, were amalgamated into three: young (below 30), middle-aged (30 to 49) and old (above 50). Included in the analysis were 1423 males and 968 females. Taking age first of all, it will be seen that for both men and women the young have elevated E scores; the middle-aged and the old do not differ very much from each other, although for both sexes there is a slight further decline. For all three ages, women are slightly less extraverted than men, although the differences are clearly quite small in absolute terms. Age differences amount to something like $\frac{1}{2}$ S.D., sex differences only to $\frac{1}{10}$ S.D. As regards social class, there is some evidence that classes 1 and 2 are somewhat less extraverted than the rest; this trend towards middle-class introversion appears in both sexes but is stronger in the men, where it amounts to $\frac{1}{3}$ S.D. All these trends are replicated from sex to sex, and are thus likely to be neither chance nor spurious selection effects.

Neuroticism scores are analysed in Table 2. There is an obvious age trend in both sexes from high N scores in the young to low N scores in the old, with the middle-aged intermediate. The strength of this trend is indicated by the fact that it amounts to about $\frac{2}{3}$ S.D. for both sexes. At each age the women have higher scores; the difference amounts to about $\frac{1}{4}$ S.D. As for

Table 1. *Extraversion scores by sex, age and class*

(n = number of respondents in each cell.)

				Classes 1–2			Class 3			Class 4			Class 5					
MALES	n	Mean	S.D.	n	Mean	S.D.	n	Mean	S.D.	n	Mean	S.D.	n	Mean	S.D.	n	Mean	S.D.
10–19	23	14·65	3·20	147	12·65	4·02	162	13·45	3·70	356	13·71	3·80	178	13·62	3·77	843	13·46	3·83
20–29	124	12·28	4·05															
30–39	84	11·27	4·54	141	10·93	4·39	76	12·41	4·58	173	12·26	4·05	25	11·88	4·45	415	11·81	4·34
40–49	57	10·42	4·12															
50–59	48	11·12	4·83	63	11·01	4·98	30	12·34	4·15	57	11·74	3·78	15	11·57	2·90	165	11·55	4·31
60–69	15	10·67	5·41															
				351	11·66	4·44	268	13·03	4·05	586	13·09	3·95	218	13·28	3·87			
FEMALES																		
10–19	12	13·92	3·06	80	12·42	3·55	440	13·03	3·38	12	13·46	3·82	44	13·89	3·59	576	13·02	3·45
20–29	68	12·15	3·56															
30–39	44	11·63	3·76	83	12·02	3·44	147	11·36	3·91	14	13·07	4·52	35	11·99	3·89	279	11·72	3·83
40–49	39	12·45	2·97															
50–59	16	11·00	4·19	26	11·02	4·41	55	12·12	3·47	12	11·08	3·78	20	10·10	3·93	113	11·40	3·90
60–69	10	11·05	4·73															
				189	12·05	3·66	642	12·57	3·59	38	12·56	4·21	99	12·45	4·04			

Table 2. *Neuroticism scores by sex, age and class*

				Classes 1–2			Class 3			Class 4			Class 5					
MALES	*n*	Mean	S.D.	*n*	Mean	S.D.	*n*	Mean	S.D.	*n*	Mean	S.D.	*n*	Mean	S.D.	*n*	Mean	S.D.
10–19	23	8·37	5·12	147	7·82	4·40	162	8·07	4·45	356	8·42	4·19	178	8·84	4·21	843	8·34	4·30
20–29	124	7·72	4·25															
30–39	84	6·19	4·28	141	6·41	4·18	76	6·23	4·03	173	7·09	4·07	25	6·76	2·93	415	6·68	4·06
40–49	57	6·74	4·01															
50–59	48	5·30	4·17	63	5·17	4·34	30	5·67	4·31	57	6·53	5·21	15	5·77	3·75	165	5·79	4·64
60–69	15	4·77	4·81															
				351	6·78	4·41	268	7·28	4·43	586	7·84	4·33	218	8·39	4·17			
FEMALES																		
10–19	12	8·79	3·55	80	8·56	4·08	440	9·92	4·17	12	8·46	3·27	44	10·02	4·80	576	9·71	4·22
20–29	68	8·52	4·17															
30–39	44	8·64	4·04	83	7·52	4·29	147	7·48	4·16	14	7·46	3·74	35	8·49	4·38	279	7·62	4·22
40–49	39	6·26	4·21															
50–59	16	6·56	4·47	26	6·33	4·24	55	6·49	3·94	12	7·67	4·13	20	6·07	4·01	113	6·50	4·07
60–69	10	5·95	3·82															
				189	7·80	4·26	642	9·07	4·34	38	7·84	3·76	99	8·68	4·74			

Table 3. *Psychoticism scores by sex, age and class*

				Classes 1–2			Class 3			Class 4			Class 5					
MALES	*n*	Mean	S.D.	*n*	Mean	S.D.	*n*	Mean	S.D.	*n*	Mean	S.D.	*n*	Mean	S.D.	*n*	Mean	S.D.
10–19	23	3·56	3·28	147	2·34	2·89	162	2·58	2·76	356	2·70	2·44	178	2·62	2·40	843	2·60	2·58
20–29	124	2·11	2·75															
30–39	84	1·65	2·00	141	1·69	2·03	76	2·11	2·79	173	2·48	2·98	25	2·62	2·66	415	2·15	2·66
40–49	57	1·76	2·08															
50–59	48	1·71	1·61	63	2·00	2·03	30	3·32	3·75	57	3·51	4·87	15	3·47	3·49	165	2·90	3·73
60–69	15	2·94	2·81															
				351	2·02	2·45	268	2·53	2·92	586	2·71	2·94	218	2·68	2·53			
FEMALES																		
10–19	12	3·42	2·57	80	1·71	2·19	440	1·87	2·28	12	2·84	2·47	44	2·60	2·17	576	1·92	2·28
20–29	68	1·41	1·97															
30–39	44	1·46	1·57	83	1·38	1·62	147	1·66	1·84	14	2·68	3·16	35	2·44	2·32	279	1·73	1·97
40–49	39	1·29	1·66															
50–59	16	1·91	1·77	26	1·52	1·53	55	2·28	2·29	12	3·50	3·17	20	2·83	3·18	113	2·33	2·51
60–69	10	0·90	0·72															
				189	1·54	1·88	642	1·86	2·19	38	2·99	2·98	99	2·59	2·46			

social class, the middle-class groups have significantly lower scores than classes 3, 4 and 5. For these three groups there is no obvious trend.

Psychoticism scores are analysed in Table 3. For both sexes, there is a U-shaped relation to age, with both young and old having higher scores than the middle-aged. The differences are not very large, but they do recur in practically all the subgroups and must therefore be regarded as suggestive. At all ages men have higher scores than women, by about $\frac{1}{4}$ S.D. Social class shows increase in P from 1 and 2 through 3 to 4 and 5; this trend is noticeable for both sexes and all ages.

The results may be summarized as follows. (1) *Age:* young people are high on E, high on N and high on P; (2) *Sex:* males are high on E, high on P, and low on N; (3) *Social class:* middle-class people are low on E, low on N and low on P. None of these differences are very large, but they are all sufficiently marked to be statistically significant.

The social variables discussed so far may not be the only ones relevant to comparison between different groups; specific jobs may have characteristic personality patterns which cut across class lines (Eysenck, 1967). For this reason details have been given in Table 4 of the mean P, E and N scores of groups of respondents having certain jobs or positions—nurses, firemen, teachers, etc. Also shown are two large groups of 700 male and 700 female students not included in our main analysis because they cannot be assigned a proper social status, and 327 housewives, also excluded for the same reason.

Students are rather high on N; both male and female students outrank all other groups in this respect (except the very small group of female apprentices). Considering their age they are very slightly introverted and below average on P, although not very much. Housewives are marginally higher on N and P than working women of roughly their own age; on E they do not differ. It is interesting that welfare workers of both sexes, as well as occupational therapists, have exceptionally low scores on P; butchers, bakers and factory workers have exceptionally high ones. Not too much must of course be read into these figures, in particular because of the small size of some of the groups, but it is felt that this table makes an interesting beginning for a dimensional study of personality correlates of different jobs and positions.

DISCUSSION

The results of this study tend on the whole to agree with previous work and with such anticipations as could reasonably be deduced from epidemiological psychiatric knowledge. They suggest that in making comparisons between experimental groups and standardization data for personality inventories, factors like sex, age and social class should be taken into account, and that standardization data should be given in much greater detail than is usually the case. It cannot of course be claimed that the data here published are representative of the population from which the sample was drawn; there are many subtle ways in which distortions could have come in to affect the overall picture. Nevertheless, the congruence between our present findings and results previously reported, and between different sections of our data, suggests that differences observed, although not large in absolute amount, are true differences. Furthermore, they are in line with common-sense observation and expectation; youth has always been the time of *Sturm und Drang*, and the high scores of our young sample on N, E and P is in line with this observation. Neither is the greater mental stability of the middle-class sample, as compared with the working-class sample, surprising in view of epidemiological evidence (Hoch & Zubin, 1961). The same applies to sex differences; the greater proportion of women neurotics and men psychotics has been noticed many times. These facts are of interest mainly in that they support the hypotheses concerning the nature of the factors labelled N and P respectively. It is to be hoped that further work will be carried on in this field to put on a safer footing the findings of this study.

Table 4

Occupation no.	Males							Females						
	P		E		N			P		E		N		
	Mean	S.D.	Mean	S.D.	Mean	S.D.	*n*	Mean	S.D.	Mean	S.D.	Mean	S.D.	*n*
1	2·028	1·930	13·495	3·803	8·764	3·816	106	2·458	1·764	15·041	1·852	12·375	3·458	12
2	1·666	1·852	12·666	3·915	5·142	3·850	21	—	—	—	—	—	—	—
3	3·261	3·440	14·166	3·171	7·023	4·273	21	—	—	—	—	—	—	—
4	2·322	1·918	13·731	3·827	8·913	3·841	110	—	—	—	—	—	—	—
5	1·557	1·781	11·576	4·896	6·750	4·459	52	1·621	1·832	13·060	3·383	6·787	4·046	33
6	3·106	3·260	13·431	3·555	8·250	4·274	80	2·365	2·714	12·191	4·097	9·430	4·461	123
7	2·050	1·707	10·700	5·012	6·750	2·879	10	1·660	1·742	12·780	3·394	8·260	3·506	25
8	2·923	2·766	14·096	3·355	8·057	4·188	26	—	—	—	—	—	—	—
9	2·757	2·989	12·500	4·498	6·863	3·931	33	—	—	—	—	—	—	—
10	1·492	1·943	11·679	4·331	6·104	3·597	67	—	—	—	—	—	—	—
11	4·184	3·742	11·973	4·395	8·000	4·396	19	3·250	2·916	10·472	3·942	9·583	4·037	18
12	2·637	2·982	13·675	3·604	8·050	4·004	40	—	—	—	—	—	—	—
13	2·888	2·274	13·666	3·871	7·277	4·000	36	—	—	—	—	—	—	—
14	2·750	3·212	12·680	4·028	7·659	4·528	282	—	—	—	—	—	—	—
15	—	—	—	—	—	—	—	2·139	2·195	11·879	3·716	8·055	4·209	327
16	—	—	—	—	—	—	—	2·214	1·953	13·452	4·049	7·833	4·099	21
17	2·515	2·088	12·062	4·576	6·546	4·314	32	1·937	1·821	12·312	5·548	8·625	4·282	8
18	2·272	3·769	13·568	4·218	6·909	4·984	22	2·087	2·393	11·375	3·880	7·687	3·628	40
19	—	—	—	—	—	—	—	0·857	1·078	12·142	3·339	7·837	4·099	77
20	3·452	3·474	12·738	4·176	7·714	4·744	21	—	—	—	—	—	—	—
21	—	—	—	—	—	—	—	1·932	2·076	13·331	3·302	9·155	4·269	199
22	3·181	2·679	13·522	3·656	8·356	4·804	66	—	—	—	—	—	—	—
23	2·385	2·553	13·170	3·914	9·382	4·425	700	1·679	1·822	12·719	3·413	10·520	3·681	700
24	1·701	1·569	12·346	4·767	6·153	3·791	52	1·185	1·537	11·278	3·485	7·550	4·272	70
25	—	—	—	—	—	—	—	2·685	2·742	12·166	2·717	10·407	5·023	27
26	0·642	0·841	12·714	3·099	5·928	4·598	14	0·962	0·969	11·148	3·720	7·185	4·411	27

Key to occupations

1. Apprentices
2. Athletes
3. Butchers and bakers
4. Chemical workers
5. Civil servants
6. Clerks
7. Data processers
8. Drivers (transport)
9. Engineers (skilled technical grades)
10. Engineers (skilled)
11. Factory workers
12. Firemen
13. Fitters (mechanics)
14. Gas fitters
15. Housewives
16. Machinists
17. Managers
18. Nurses
19. Occupational therapists
20. Salesmen
21. Secretaries
22. Services (N.C.O. groups)
23. Students
24. Teachers
25. Telephonists
26. Welfare social workers

It might be asked why the statistical analysis of the data has not been more detailed. We have relied on simple listing of means and standard deviations partly because the gross inequalities of numbers in the different subgroups made any refined analysis impossible, but mainly because with rough data of this kind, selected without the possibility of planned sampling, it may be a task of supererogation to use complex statistical methods for teasing out trends which are quite apparent to casual inspection. We have been more concerned to see trends from one sex duplicated in the other, or from one age group in the others, than rely on statistical tests of significance which with such large total numbers attribute significance to differences which may not be of any great importance psychologically. Future inquiries may with advantage set up specific hypotheses based on our findings, construct samples according to some preconceived scheme, and then test the results by appropriate analysis of variance. The present study does not claim to be more than an exploratory investigation, and the results are offered as suggestive rather than as definitive.

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