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THE LOCATION OF SUPERFACTORS P, E AND N WITHIN AN UNEXPLORED PERSONALITY FACTOR SPACE

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Summary—Two questionnaires designed by Howarth (HPQ, APF2) whose factor space is unexplored and the EPQ (Eysenck) were jointly scale factored on 79 subjects, under the hypothesis that Eysenck's superfactors of P, E, and N should be represented as major influences in the resultant factor structure. A principal components analysis yielded 7 factors from 24 by the Kaiser–Guttman and Scree Test, these 7 being rotated to a maximum simple structure by the Direct Oblimin procedure. Although failing to satisfy Bargmann's test of simple structure, this solution was accepted as adequate, noting the deficiencies of Bargmann's test and the efficiencies of the rotation method used. Within the 7 factor solution, P, E, and N were seen to be located as factor numbers 2, 3 and 1, respectively. One interesting detail is that a sociability primary loaded with an impulsivity primary on the Extraversion factor contrary to Guilford's (1977) arguments for the independence of these primaries. It is concluded that Eysenck's assertion of the enduring stability and breadth of the PEN factor triad has been upheld.

During recent years, Howarth (1970, 1971, 1972) has been engaged in large scale factor analysis of personality questionnaires. With Browne (Browne and Howarth, 1977) he carried out a massive factor analysis of 400 items over 1003 Canadian students, yielding 20 personality factors. From studies such as these, Howarth developed the HPQ (Howarth Personality Questionnaire) and the APF2 (Additional Personality Factor Inventory—2). The 10 factor scales in the HPQ are what Howarth calls 'mainstream factors', that is, factors established according to the criteria put forward by Harman and French (1973) concerning replicability and consensus within the literature. The HPQ factors are: Sociability (SY), Trait Anxiety (AE), Dominance (AD), Conscience/Superego (SG), Hypochondriasis (HM), Impulsive (IP), Cooperation/Considerateness (CC), Inferiority (IF), Persistence (PS), and Suspicion vs Trust (ST). The APF2 questionnaire is composed of 10 adjunct factor scales, factors of lesser variance than those in the HPQ but nevertheless important for predictive purposes, (Howarth, 1976). The APF2 factors are: Fear of being socially unacceptable (FS), Hope (HP), General Activity (GA), Anxiety State (AS), Dislikes–Annoyances/Neurotic Proneness (DA), External Control (EC), and Rigidity (RY). Both the HPQ and APF2 factor scales are represented by 12 items on each scale; Howarth (1976) also gives some indications that the scales are correlated to varying extents within and between questionnaires. Further information about scale description, reliabilities, and inter-correlations may be obtained from Howarth (1976, 1978).

In the late 1960s, Eysenck and Eysenck (1968) reported a series of investigations concerned with isolating a questionnaire factor of Psychoticism or Tough Mindedness. They succeeded in this and subsequently published the EPQ (Eysenck Personality Questionnaire), yielding information across 4 factor scales of Extraversion (E), Neuroticism (N), Psychoticism (P), and a Lie scale (L) (Eysenck and Eysenck, 1975, 1979). The scale correlations between E, N and P are sex dependent, but, considering a joint sample factoring, the correlation between N and E given by Eysenck (1978) is -0.24, N and P is 0.19, E and P is -0.32.

Recently, interest has been focused on the dimensionality of Extraversion. Guilford (1975, 1977) argued for two independent second order factors akin to the unitary concept of Extraversion, one being Social Activity (defined in part by a Sociability primary), the other being Extraversion, involving an Impulsivity primary. Eysenck (Eaves and Eysenck, 1975; Eysenck, 1977), however, maintained that while both Sociability and

Impulsivity may exist as correlated primary factor concepts, they both load a second order unitary factor of Extraversion. Loo (1979) in a hierarchical factoring of the EPQ has provided evidence for a complex set of primaries and secondaries, with only what he calls 'Social Extraversion' (found at the second order) corresponding to Eysenck's Extraversion factor. Noticeably, an impulsivity primary did not load upon this factor, rather, as Guilford would expect, a primary factor of Sociability loaded significantly; no Impulsivity/Extraversion factor was found. However, there are problems associated with the Loo study concerning the lack of information provided as to the method of factor retention, attainment of simple structure, and higher order rotation methodology. [Cattell and White (in Cattell, 1978) or Hendrickson and White (1966).] Also four of the Loo primaries have only 3 or less item loadings $> \pm 0.3$, suggesting that they may be narrow specifics, not common factors (Barrett and Kline, 1980).

Eysenck (1978) has recently referred to the P, E and N factors as 'superfactors', that is, factors which are found to exist at higher orders. Both conceptual and methodological reasons are cited by Eysenck for the importance of such factors over and above the primaries usually extracted in factor-analytic investigations. If the superfactors are as influential as Eysenck maintains, then a cojoint factoring of these scales with any set of broad-based primaries should yield at least three strong factors representing the superfactor domain. To this end, the HPQ, APF2, and EPQ were cojoint scale factored to test directly the hypothesis of superfactor existence.

METHOD

Subjects

Undergraduates from within the Psychology department were asked to complete the three questionnaires. Group testing took place on one occasion, questionnaires being answered in the order of APFs, EPQ and HPQ; the total time allocated was 80 min. From the data given by a total of 100 subjects, 28 male and 51 female sets were retained for the subsequent analysis, the other 21 sets were abandoned due to 'spoiled' or incomplete sets.

Each questionnaire was raw scored by scale yielding a total of 24 scale scores per subject. Profile comparison was undertaken between the male and female samples and normative data provided by the authors in order to investigate comparability of samples (Howarth, 1978; Eysenck, 1975). While Hotelling's (1931) T^2 statistic is an ideal method for testing a multivariate mean vector hypothesis, the normative raw data was not at hand to compute the respective variance-covariance matrices, additionally, such a global test does not provide information of sufficient detail so as to permit identification of significant mean differences. Thus, for the male and female samples respectively, 48 variance ratio tests and 48 independent sample t tests were carried out, using an adjusted test size of 0.000525, approximately equivalent to a size of 0.05 two tail. Of course, the assumption of zero covariance between variables within a sample is questionable in this case, due to reported factor scale intercorrelations. However, the effects of such covariance is difficult to ascertain, hence reliance was placed upon the robustness of the two tests. Two tail significance levels were computed using the Cornish and Fisher (1937) approximation to the F distribution (as given in Kendall and Stuart, 1977) and an approximation to the t distribution. All F ratio tests were non significant. However, in the female sample, mean differences between the scales of HPQ Existential Realisation (normative mean = 4.0, sample mean = 5.25) and EPQ Psychoticism (normative mean = 2.99, sample mean = 4.39) were observed. Thus overall, the samples appeared to be sufficiently similar to the normative data to allow meaningful comparison of results, and subsequently a Pearson r intercorrelation matrix was computed using the combined male and female sample data. Although the sample size is not large, the conservative null hypotheses were not rejected in all cases except those stated. Of course, this does not provide proof of similarity of data, rather that evidence to the contrary is not sufficient within the sample data. Hence, given that no other technical constraints are broken, the expectation is that any factor structure found from this analysis must be a close approxi-

mation to a study using a larger sample from the same population. Standard errors of the r_p correlations are in this sample ± 0.11, in a sample of 200 subjects ± 0.07; a difference overall of only ± 0.04.

Procedure

The correlation matrix was submitted to a principal components analysis, the number of factors to be extracted for rotation was determined by the Kaiser-Guttman root 1.0 criterion (Guttman, 1954) for the lower bound, and by the Scree Test (Cattell, 1966) for the actual number. Factor rotation was carried out using the Direct Oblimin method (Jennrich and Sampson, 1966; Jennrich, 1979); the convergence criterion was set at 0.00001, with a maximum of 200 iterations specified in order to reach convergence. In order to ascertain the best approximation to simple structure, ± 0.1 hyperplane behaviour was noted by sweeping the parameter δ from -30 to 0.5 in steps of 0.5 (broadscan) and then in steps of 0.1 (finescan) around the maximum hyperplane count associated with a δ from the broadscan rotation sequence. Fixing the final rotated position from within a set or plateau of equal hyperplane counts was carried out by considering the sum of squared loadings of variables within the hyperplane, and thus choosing the minimum as being indicative of the final factor position. It should be noted that total solution hyperplane counts were considered in this procedure, no attention was paid to maximising any one particular factor's hyperplane count to the detriment or otherwise of any other factor or factors. Explained variation for each rotated factor was computed using the following equation:

$$\mathrm{VAR_{RF}} = \sum_{i}^{n} r_{ij}a_{ij} \text{ for each } j \text{ to } m \text{ factor}$$

where

$\mathrm{VAR_{RF}}$ = Variance accounted for by rotated factor j

r_{ij} = correlation of variable i with factor j

a_{ij} = loading of variable i on factor j

Finally, the Bargmann (1955) test of simple structure was then implemented using the tables provided by Kameoka and Sine (1978) given in Cattell (1978).

RESULTS

Measures of sampling adequacy (Kaiser and Rice, 1974; Cerny and Kaiser, 1977; Meyer *et al.*, 1977) were determined from the correlation matrix in order to assess its suitability for component analysis. The overall MSA = 0.71, sufficiently high to permit further analysis. From the principal components analysis, the Kaiser–Guttman criterion yielded 7 factors, as did the Scree test. The Direct Oblimin broadscan rotation indicated a hyperplane count plateau between $\delta = -1.5$ and $\delta = 0.5$, thus a finescan rotation was implemented between $\delta = -1.4$ and $\delta = 0.4$. Two maxima were observed within this plateau, at $\delta = -1.4$ and at $\delta = 0.4$; the overall hyperplane count plateau range extending from 69 to 73. The solution at $\delta = 0.4$ was chosen as the final fix, on the basis of its minimum sum of squared loadings within the hyperplanes across each factor. Convergence of the Direct Oblimin function took place at the 32nd iteration. Table 1 shows the various loadings and statistics associated with the solution, Table 2 gives the factor intercorrelation matrix.

The Bargmann test of simple structure was satisfactory for factor 3 only at $p < 0.05$. However, given the existence of a loading pattern in unrotated component or factor space, it is possible that any rotation of factor axes can never reach a simple structure as expected by the Bargmann test values. The very nature of the unrotated loading spatial configuration is such that it cannot be simplified beyond the expected Bargmann values.

Table 1. Rotated factor pattern matrix

	Variables	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
APF2	Social Sensitivity (FS)	0.474	0.529	0.316	−0.248	0.024	0.008	−0.098
	Hope (HP)	−0.273	−0.016	−0.050	0.746	0.004	0.146	−0.124
	General Activity (GA)	0.038	0.033	0.447	0.555	0.087	0.151	0.073
	Anxiety State (AS)	0.663	−0.241	−0.093	0.190	−0.014	−0.093	−0.072
	Existential Realisation (ER)	0.032	−0.158	0.085	−0.090	0.193	−0.004	0.913
	Involvement (IV)	0.253	−0.141	0.568	0.165	0.276	0.108	−0.339
	Unusuality (UP)	0.269	−0.057	0.010	0.296	−0.324	0.434	0.118
	Dislikes-Annoyances (DA)	0.197	0.382	−0.032	−0.030	−0.309	−0.325	−0.153
	External Control (EC)	0.063	−0.010	0.002	−0.164	−0.004	0.916	−0.034
	Rigidity (RY)	0.011	0.758	−0.209	0.036	−0.120	−0.007	0.094
HPQ:	Sociability (SY)	−0.068	−0.039	0.930	−0.167	−0.019	−0.066	0.049
	Anxiety (AE)	0.823	0.099	0.005	−0.099	−0.052	0.133	−0.019
	Dominance (AD)	−0.079	0.236	0.141	0.488	−0.577	0.013	0.132
	Conscience (SG)	−0.161	0.754	0.165	−0.013	0.133	−0.073	−0.152
	Hypochondriasis (HH)	0.887	−0.032	−0.002	0.029	0.180	−0.008	0.191
	Impulsive (IP)	0.109	−0.687	0.364	0.001	−0.302	−0.166	0.022
	Cooperativeness-Considerateness (CC)	−0.107	0.105	0.017	0.217	0.683	0.406	−0.165
	Inferiority (IF)	0.563	−0.027	−0.369	−0.313	0.071	0.161	−0.159
	Persistence (PS)	0.090	−0.029	−0.068	0.888	0.101	−0.230	−0.077
	Suspicion vs Trust (ST)	0.456	0.288	−0.047	0.178	−0.346	0.184	0.391
EPQ:	Lie Scale (L)	0.055	0.237	−0.003	0.095	0.811	−0.169	0.288
	Extraversion (E)	−0.133	−0.017	0.881	0.062	−0.138	−0.004	0.111
	Neuroticism (N)	0.908	0.083	0.059	−0.094	0.026	0.021	−0.039
	Psychoticism (P)	−0.012	−0.548	0.017	−0.154	−0.414	0.168	0.303
Unrotated-variance coefficient		4.901	4.034	2.450	2.201	1.479	1.274	1.065
Rotated-variance coefficient		3.925	2.751	2.720	2.500	2.338	1.610	1.562
Final hyperplane counts		9	11	14	10	9	10	10

Table 2. Factor intercorrelation matrix

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
Factor 1	1.000						
Factor 2	0.045	1.000					
Factor 3	−0.048	−0.123	1.000				
Factor 4	−0.253	−0.075	0.206	1.000			
Factor 5	−0.259	0.062	0.028	0.005	1.000		
Factor 6	0.028	−0.189	0.253	0.084	−0.057	1.000	
Factor 7	−0.003	−0.040	0.033	0.145	−0.285	0.088	1.000

Remember also that the test tables are generalized to cover all pattern matrices with a set number of items and factors, regardless of specific solution communalities.

One important check was applied to the above solution as a whole, its basis in the possibility that the second order factor scales of P, E and N might through their larger variance coverage selectively distort the solution, favouring their structural representation. A separate principal components analysis was carried out with the factors P, E, N and L excluded. (L, while not specifically quoted by Eysenck as a superfactor, does nevertheless appear at the second order on some occasions). Factoring took place using the same procedure as above yielding a 6 factor solution. Pearson correlation and Tucker congruence matrices were calculated between this new solution and the previous rotated factor pattern matrix yielding clear results.

Factors 1, 2, 3, 4 and 6 in the first 24 variable factoring being found in the second 20 variable factoring. Factors 5 and 7 may be said to have dissociated into factor 4 of the second study.

Table 3. Pearson r_p and Tucker congruence similarity matrix

Factors (1st study)	Factors (2nd study) 1	2	3	4	5	6
1	−0.5000	0.9104	−0.1994	0.0230	−0.2362	−0.3136
	−0.3580	0.9312	−0.0587	0.2821	0.0983	−0.2739
2	−0.0728	−0.1793	0.9145	0.0799	−0.2312	−0.4007
	−0.0430	−0.0282	0.9166	0.1916	−0.0683	−0.3927
3	−0.0725	−0.4457	−0.2448	−0.1064	0.9501	0.0267
	−0.0301	−0.1936	−0.1565	0.0849	0.9482	0.0172
4	0.9742	−0.1885	−0.0840	0.0836	0.0547	0.1601
	0.9335	0.0346	−0.0019	0.2549	0.2348	0.1391
5	−0.0282	0.0267	0.2912	−0.6791	0.2333	0.4536
	−0.0342	−0.0052	0.2740	−0.6222	0.1737	0.4540
6	−0.2076	0.1591	0.1533	0.1704	−0.0137	0.8283
	−0.1647	0.2792	0.2015	0.2895	0.1387	0.7820
7	−0.1336	−0.2391	−0.2796	0.7351	−0.2495	0.0040
	−0.1199	−0.1528	−0.2507	0.6949	−0.1593	0.0014

Pearson r's are given first followed by the congruence coeff.

A final point with regard to the topological/Rotoplot enthusiasts is that concerning the efficacy of the Direct Oblimin rotation procedure in yielding a good simple structure. While Crawford (1975) has cast doubt upon its capacity to simplify certain sets of data, Hakstian and Abell's (1974) conclusions contraindicate this deficit. For example, Hakstian and Abell achieve a graphical solution hyperplane count of 27 for the 20 variable box problem (Thurstone, 1947) using Direct Oblimin, while Crawford achieves a count of only 18. Note, also, that both studies used only a small subset of possible δ values for the Direct Oblimin procedure, unlike the procedure adopted here. A complete rotation sequence is essential when using analytic rotation procedures with determinant parameters; hyperplane counts must be demonstrated to have reached a maxima. The most commonly used value of $\delta = 0$ does have certain positive characteristics (Harman, 1976) but this should not be accepted as the only value or region to be examined.

DISCUSSION

Considering only those loadings above 0.3 as being conceptually significant, the first 5 factors appear to be the most easily interpreted. Factor 1 quite clearly is Neuroticism, factor 2 with loading sign reversed can be interpreted as Psychoticism. Involved in this factor is Eysenck's P, low Self Control/Conscience (SG), low Rigidity (RY) and a lack of Social Sensitivity (FS). Impulsivity (IP) and a lack of Neurotic Pronenes (DA) are also represented on this factor, ancillary to but nevertheless important in the concept of Psychoticism. Factor 3 is clearly an Extraversion factor loaded by Sociability (SY) and to a lesser extent Impulsivity (IP). This is an interesting results in the light of the duality arguments above; contrary to Guilford's arguments, both Sociability and Impulsivity have loaded on the one factor, supporting Eysenck's contention of unifactoriality. Also the small but significant loading of Social Sensitivity (FS) suggests that the sociable extravert is conscious of the set of social rules to be followed in successful social interactions. Factor 4 involves General Activity (GA), Hope/Optimism (HP), and Persistence (PS), akin to Comrey's factor of Activity vs Lack of Energy (Comrey *et al.*, 1958; Comrey and Duffy, 1968). Factor 5 with its loadings on the EPQ L scale, Cooperativeness-Considerateness (CC), low Dominance (AD) and low Unusuality of Thought (UP) corresponds with the concept of Social Desirability. Noticeably missing from factor 5, though, is HPQ factor Conscience/Super-ego (SG). Howarth maintains that both SG and CC should combine together as both are closely related, however, in none of the factors was this so. This is perhaps due to the differing concepts of these two factors in questionnaire studies. Howarth has noted that there may be a tendency for CC to be influenced by Social Desirability, thus this would load on any such factor found in a study, while SG would remain unaffected, being related to a self image defined internally rather than by external social criteria. Factors 6 and 7 appear to be specifics with high loadings from

only one factor respectively. Conceptually they provide little breadth of behavioural complexity.

As a further aid to interpretation of the factors, an item analysis was implemented, correlating the total scores on the E, N, P, and L scales with the score (1, 0) on each of the 120 HPQ and 120 APF2 items. Point biserial coefficients were calculated, those significant beyond $P < 0.01$ (two tail) are presented in Appendix I. A positive coefficient indicates the response 'yes' to that item, a negative coefficient indicates the response 'no'.

The order of the factors extracted, determined by the variance accounted for, surprisingly found Psychoticism preceding Extraversion; however, looking at the rotated variance coefficients, this order is tenuous, there being a 0.031 difference between these coefficients. However, in the factoring of the reduced variable matrix ($N = 20$), factors 1, 2, and 3 remained in the same order although they changed their actual extraction positions. Thus the addition of these factors to the reduced matrix does change the positional characteristics but not the extraction order of the triad P, E and N. The effect of the EPQ second order P, E, N and L variance can be viewed as the behaviour expected from strong marker variables, they do not radically change or distort factor structure but rather assist in interpretation of that structure.

In conclusion, factors 1, 3, and 2 appear closely related to Eysenck's superfactors of N, E and P; the L factor scale contributing to a second order described as Social Desirability, Eysenck's assertion of Extraversion as a unitary concept being upheld. The results confirmed the influence of these superfactors among a set of primaries that have hitherto not been subjected to factor-analytic investigation.

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APPENDIX I

Item analysis of HPQ and APF2 items, and EPQ scale scores
Scale extraversion

	Item	Correlation	
APF2	FS 101	−0.3487	I do not like the unexpected to happen.
	HP 112	0.3252	I like to be constantly active.
	GA 3	0.4605	I like to be active.
	GA 23	0.5911	I possess lots of vim and vigor.
	GA 33	0.5116	I am said to be a very energetic person.
	GA 43	0.5045	I prefer active to quiet amusements.
	GA 63	0.4854	I enjoy and seek out many different kinds of play and recreation.
	GA 83	0.3758	I like to be constantly on the go.
	AS 4	0.3323	I feel overexcited.
	AS 44	0.4446	I feel activated.
	IV 6	0.3400	Do you become involved in the affairs of others?
	IV 36	0.3960	I have often been able to comfort others.
	IV 76	0.3976	I am regarded as one who 'gets involved'.
	IV 106	0.4741	I like others to share their troubles with me.
	UP 47	0.3705	I enjoy the challenge of new ways of thinking.
	UP 87	0.3146	I have been told I have an original mind.
	UP 107	0.3038	I enjoy stimulating conversation.
	DA 28	0.3019	I don't mind if a store assistant is indifferent or impolite.
	RY 20	−0.2992	I am a methodical, somewhat 'tracked' person.
	RY 60	0.4980	I enjoy having to adapt myself to new and unusual situations.
HPQ	SY 1	−0.3825	I prefer to vacation in quiet places.
	SY 21	0.4841	Do you like going out a lot?
	SY 31	0.4262	I like to attend lots of social functions.
	SY 41	0.6398	I make new friendships easily.
	SY 51	0.4816	At a party I like to meet as many people as I can.
	SY 61	0.5940	It is easy for me to talk with people.
	SY 71	0.6157	I am a good social mixer.
	SY 81	0.3501	I enjoy parties where there are lots of people.
	SY 91	0.6724	I am a sociable, outgoing person.
	SY 101	−0.5808	I generally keep in the background on social occasions.
	SY 111	−0.3736	I prefer to stay at home with a hobby rather than attend a lively party.
	AE 42	−0.3171	You feel lonesome even when you are with other people.
	AD 23	0.2962	I speak out in meetings to oppose those whom I feel sure are wrong.
	AD 83	0.3383	People say that I have leadership ability.
	AD 93	0.3100	My opinion often sways others.
	IP 6	0.3064	I enjoy taking risks just for fun.
	IP 46	−0.3473	I seldom make decisions on the spur of the moment.
	IP 56	−0.4129	You are regarded as a controlled and cautious individual.
	IP 76	0.3274	On the whole I am rather an impulsive person.
	CC 107	0.3794	I easily become involved in straightening out other people's problems.
	IF 28	0.3940	At a social event people are usually glad to meet me.
	IF 38	0.5321	I am most often successful in dealing with people.
	IF 48	0.3451	Are you a self-confident person?
	PS 119	0.4808	I am regarded as a very energetic person.

Scale neuroticism

	Item	Correlation	
APF2	FS 21	0.5047	I am afraid of making social errors.
	FS 41	0.3843	I would suffer greatly if I became a social outcast.
	FS 61	0.4326	I fear being socially unacceptable.
	FS 71	0.3426	I find that social rules are a source of worry for me.
	FS 81	0.3849	It is important to be socially acceptable.
	FS 91	0.3969	I try hard to be accepted by the social group.
	HP 2	0.3466	Some setbacks have put me way down.
	HP 22	−0.4987	Whatever happens I am never without hope.
	HP 72	−0.3057	In the face of discouragement I keep on hoping.
	GA 73	−0.3337	Finding the energy for many activities is no problem for me.
	AS 4	0.4747	I feel overexcited.
	AS 24	0.4615	I feel anxious about something.
	AS 34	−0.3046	I feel relaxed.
	AS 54	0.2945	I feel unable to take it easy today.
	AS 64	0.3476	I am jittery right now.
	ER 85	−0.3154	I accept the brevity and finiteness of human life.
	IV 96	−0.2961	I am rarely worried by hearing about the misfortunes of others.
	IV 116	−0.3053	I am tolerant of the opinions of others.
	VP 77	0.3666	I yearn for a new orientation in life.
	VP 97	0.2962	Given a chance I would entirely re-orient my life.
	DA 78	0.3796	Being interrupted in the middle of a job annoys me.
	RY 100	−0.4633	I tend to disregard social pressures.
HPQ	AE 2	−0.3600	I find it easy to put my worries aside and relax.
	AE 12	0.5148	I sometimes feel that life is not worth living.
	AE 22	0.3507	People often say or do things which annoy me.
	AE 32	0.5309	I often feel 'just miserable' for no good reason.
	AE 52	0.5678	I am easily 'rattled' and upset.
	AE 62	0.4566	Sometimes quite trivial troubles keep going around in my mind.
	AE 72	0.5266	I am frequently over-annoyed by quite small setbacks.
	AE 82	0.5714	I frequently worry about possible misfortunes.
	AE 92	0.5714	Do you suffer from 'nerves'?
	AE 102	0.4139	Have you often felt listless or tired for no good reason?
	AE 112	0.5596	I sometimes feel happy and sometimes depressed without any apparent reason.
	HM 5	0.3969	I am inclined to be moody.
	HM 15	0.5054	You are troubled by unusual fears or distastes.
	HM 25	−0.4335	I seldom suffer from sleeplessness.
	HM 35	0.3899	I sometimes get very bad headaches.
	HM 55	−0.4368	I almost always feel well and strong.
	HM 65	0.4636	I often lose sleep over my worries.
	HM 75	0.3308	Do ideas run through your head and prevent you from sleeping?
	HM 85	0.4816	Do you often get heart thumping or palpitations?
	HM 95	0.4006	Do you worry about your health?
	CC 17	−0.3418	I seldom get an unreasoning dislike for another person.
	CC 67	0.4032	If asked to work on a charity drive I would politely say I was busy.
	IF 8	0.3700	I feel that I am not a successful person.
	IF 38	−0.3063	I am most often successful in dealing with people.
	IF 48	−0.3865	Are you a self-confident person?
	IF 58	0.5291	Are your feelings easily hurt?
	IF 68	−0.3755	I feel confident that I will succeed in life.
	IF 78	0.5219	Are you troubled with feelings of inferiority?
	IF 88	−0.5012	Very few events disturb my self-confidence.
	IF 108	0.3501	Are you easily hurt when people find fault with you?
	TS 10	0.3006	I often wonder what hidden reason another person may have for doing something nice for me.
	TS 30	0.4339	There are times when it seems everyone is against you.
	TS 60	−0.3546	Most people respect the rights of others.
	TS 70	0.3744	I have been seriously slighted more than once.
	TS 120	0.3048	People pretend to care more about one another than they really do.

Scale social desirability

	Item	Correlation	
APF2	FS 11	−0.3264	I am quite often careless about social etiquette.
	UP 67	0.3809	I am content with the way things are.
	UP 117	−0.3119	Lots of people are unimaginative.
HPQ	SG 4	0.4929	Individuals should always show respect for the law.
	SG 24	0.2940	I admire my parents in all important matters.
	SG 104	−0.2953	I have often gone against my parents' wishes.
	IP 36	−0.4102	Do people say you sometimes behave rashly?
	IP 56	0.3088	You are regarded as a controlled and cautious individual.
	IP 96	0.3659	Uncontrolled impulsiveness is not part of my make-up.
	CC 7	0.3195	I am a co-operative and helpful person.
	CC 57	0.2976	I always try to do unto others as I would have them do to me.
	CC 67	−0.3265	If asked to work on a charity drive I would politely say I was busy.
	CC 97	0.3141	I make a point of helping others.
	CC 117	0.3190	I refrain from criticizing other people.
	TS 90	−0.3261	I sometimes suspect the motives of others.

Scale psychoticism

	Item	Correlation	
APF2	FS 11	0.5429	I am quite often careless about social etiquette.
	FS 51	0.3857	I have often made social errors.
	ER 105	0.2989	People pretend life is more important than it really is.
	ER 115	0.3209	Any hidden purpose behind what we see is unreal and self-deceiving.
	IV 26	−0.3398	I like to help other people.
	DA 108	−0.3230	I dislike people who do not know how to behave themselves.
	EC 39	−0.3327	I believe that: 'I am the master of my fate'.
	RY 20	−0.2937	I am a methodical, somewhat 'tracked' person.
HPQ	SG 4	−0.4587	Individuals should always show respect for the law.
	SG 14	−0.5551	Good manners are extremely important.
	SG 24	−0.3138	I admire my parents in all important matters.
	SG 34	0.4873	I prefer to go my own way rather than acting on approved rules.
	SG 94	−0.4115	The police can be trusted not to ill-treat innocent people.
	SG 104	0.5037	I have often gone against my parent's wishes.
	SG 114	0.3407	I think I am more easygoing about right and wrong than most people.
	IP 6	0.4732	I enjoy taking risks just for fun.
	IP 16	−0.3667	I rarely act without careful consideration.
	IP 36	0.4057	Do people say you sometimes behave rashly?
	IP 46	−0.3263	I seldom make decisions on the spur of the moment.
	IP 56	−0.3881	You are regarded as a controlled and cautious individual.
	IP 76	0.3759	On the whole I am rather an impulsive person.
	IP 86	0.3895	I often act on the first thought that comes into my head.
	IP 96	−0.3684	Uncontrolled impulsiveness is not part of my makeup.
	IP 116	0.3660	I enjoy doing daring, foolhardy things.
	CC 7	−0.4090	I am a co-operative and helpful person.
	CC 17	−0.3048	I seldom get an unreasoning dislike for another person.
	CC 57	−0.4668	I always try to do unto others as I would have them do to me.
	IF 18	−0.3037	I usually realize my personal expectations.
	PS 99	−0.3133	When perplexed by a difficult problem I keep trying to solve it.
	TS 60	−0.3156	Most people respect the rights of others.