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THE VALIDITY OF QUESTIONNAIRE AND RATING ASSESSMENTS OF EXTRAVERSION AND NEUROTICISM, AND THEIR FACTORIAL STABILITY

BY SYBIL B. G. EYSENCK* AND H. J. EYSENCK
Institute of Psychiatry (Maudsley Hospital) University of London

Groups of nominated extraverts and introverts, and of stable and neurotic subjects were given a 188-item questionnaire containing questions thought to be relevant to the measurement of these two dimensions of personality. Factor analyses were also carried out for 124 of these items making available factor loadings on these two dimensions. An analysis was carried out of the relationship between rated and self-rated behaviour, and it was concluded that as far as extraversion was concerned, there was considerable agreement between these two methods of assessment. As regards neuroticism, agreement was much less close, and a theoretical explanation of this fact is given, supported by a special analysis of the empirical data. It was found that the factor analytic method of locating the E and N factors had considerable stability as from one study to another, in spite of considerable differences between the studies in choice of sample, choice of items, and other factors.

1. INTRODUCTION

The vast majority of studies in the personality field use either ratings or self-ratings (questionnaires) as the criterion, although the validity of these criteria has never been very firmly established. After reviewing the evidence, Eysenck (1960*a*) concluded that while both methods were subject to possible errors of various kinds, these errors were different for the two methods; agreement between them could therefore reasonably be regarded as evidence of validity for both. Disagreement between the two methods cannot be interpreted very easily in the absence of further evidence, as it might be due to lack of validity in either the questionnaire responses, or the ratings, or both. Considering the importance of this issue, it is remarkable how little empirical evidence is available, particularly in the non-psychiatric field. The experiment here reported constitutes an attempt to provide some evidence on this point, with particular reference to the two personality dimensions of extraversion and neuroticism. An effort has also been made to study the stability of these two factors by comparing different factor analyses using the same items.

2. METHOD OF STUDY

The method here used, one of several discussed by Eysenck (1954), is called the *method of nominated groups*; it has been used previously by S. B. G. Eysenck (1962) in an attempt to validate the M.P.I. (Eysenck, 1959) against a rating criterion. The procedure used was as follows. Members of the Psychology Department in the Institute of Psychiatry were asked to nominate friends or acquaintances, known to them for some while, who seemed to them to be oustandingly extreme on either the *extraversion* or *neuroticism* dimension, or both. In other words, they were asked to pick people on the basis of their *behaviour*, if this seemed to them to be extremely extra-

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verted, extremely introverted, extremely stable, or extremely neurotic. Some judges chose candidates who seemed to them to be high on both dimensions. To guide the judges, the following definition of extreme extraversion and introversion was given them:

The typical extravert is sociable, likes parties, has many friends, needs to have people to talk to, and does not like reading or studying by himself. He craves excitement, takes chances, often sticks his neck out, acts on the spur of the moment, and is generally an impulsive individual. He is fond of practical jokes, always has a ready answer, and generally likes change; he is carefree, easygoing, optimistic, and likes to 'laugh and be merry'. He prefers to keep moving and doing things, tends to be aggressive and lose his temper quickly; altogether his feelings are not kept under tight control, and he is not always a reliable person.

The typical introvert is a quite, retiring sort of person, introspective, fond of books rather than people; he is reserved and distant except to intimate friends. He tends to plan ahead, 'looks before he leaps', and distrusts the impulse of the moment. He does not like excitement, takes matters of everyday life with proper seriousness, and likes a well-ordered mode of life. He keeps his feelings under close control, seldom behaves in an aggressive manner, and does not lose his temper easily. He is reliable, somewhat pessimistic, and places great value on ethical standards.

For neuroticism, it was suggested they nominate people who seemed to them to behave as if they had a large number of neurotic symptoms, and whom they would expect to break down fairly easily given some degrees of stress. On the other hand, the stable group required was to contain people who seemed so non-neurotic to the judge concerned that only the very greatest stress would produce neurotic symptoms and behaviour or a tendency to break down.

The judges were asked to make sure that the subjects were neither psychologists, nor married to psychologists, and that their English was adequate to answer the many questions contained in the inventory. The subjects thus nominated were then asked, by the judges, to fill in a questionnaire of 170 items thought to be relevant to extraversion or neuroticism (including the 48 items of the M.P.I.); there were also 18 'Lie Scale' items which are of no relevance in this connexion. Completed questionnaires were sent directly to the authors by the subjects, and were not seen by the judges. There were 25 subjects in each of the four groups: E, I, S and N (S, stable; N, neurotic; E, extravert; and I, introvert). The total number of subjects was 100, but several were allocated to more than one group by the judges, of whom there were 22.

The identification of an item as being diagnostic of extraversion, introversion, stability or neuroticism cannot of course be undertaken on a purely subjective basis. For 124 items, factor loadings on E and N were available from a factor analysis which had been undertaken on a separate group of 300 subjects. The essential comparison in this study will be of the factor loadings of any given item with the degree to which that item differentiates between the E and I, or the S and N nominated groups. This differentiating property of the item will be designated the D (difference) score; it is calculated by subtracting the number of endorsements by nominated introverts from that given by nominated extraverts (D_E), and by subtracting the number of endorsements by nominated stable subjects from that given by nominated neurotic subjects (D_N). The main hypothesis under examination predicts that items with high D_E scores will also have high loadings on the E factor, while items with high D_N loadings will have high loadings on the N factor. (Both loadings and D scores can be positive or

negative, of course, and in the above sentence the word 'high' is understood as meaning 'high positive'; a high negative value would be called 'low'. This convention will be followed throughout this paper.)

3. Factor analysis

The 124 items used in the analysis were selected from the total number in the questionnaire on *a priori* grounds, and are given in Appendix Table 1. They were divided into two groups, as the electronic computer was unable to accept the total set. The 300 subjects were University and evening class students, 140 male and 160 female. In addition to the 62 personality questions there was also included in each matrix of intercorrelations scores for age and sex, the number of '?' responses, and the 'Lie' scale score. Product moment correlations were run between the 68 variables in each case, and a principal components analysis performed; three factors were taken out in each of the two analyses. Rotation was undertaken in accordance with Thurstone's principle of simple structure, and the first two factors were clearly identified as neuroticism and extraversion; loadings on these two factors for the 124 items are given in Appendix Table 1. (Evidence for this identification will be given below.) The third factor had high and almost identical loadings in the two analyses for 'Age' (0·511 and 0·491) and for the 'Lie' scale score (0·430 and 0·441). The 'Lie' score also had negative loadings on Neuroticism ($-0{\cdot}226$ and $-0{\cdot}217$). The number of '?' responses had negative loadings on Extraversion ($-0{\cdot}135$ and $-0{\cdot}186$). Loadings on sex for E and N are quite low, being 0·182 and 0·162 in the first analysis, $-0{\cdot}229$ and 0·145 in the second (maleness being scored 1 point, femaleness 0 point). The third factor, with its high loadings on age and lie scores is not of great psychological interest, and will not be discussed further. The other two factors suggest a distribution of traits in the two-dimensional E–N universe rather along the lines indicated in Fig. 1; the similarities between such a picture and that of the old Galen–Kant–Wundt theory have been pointed out by Eysenck (1960*a*). In making up this figure, we have drawn mainly on the results of this study, but have also taken into account other published (Eysenck, 1956, 1959, 1962*a*, *b*; Eysenck & Eysenck, 1962) and unpublished work.

Our identification of the E and N factors may be questioned. The first line of evidence, of course, lies in the similarity of the items defining each factor with the trait-names used in describing the types. More objective, perhaps, is the evidence presented in the next section, relating to the responses of the nominated groups. A third line of evidence relates to the similar pattern of factor loadings emerging from the present study as compared with the original factor analysis of the M.P.I. items (Eysenck, 1956). If we look at the N items in this original study, we find that none of them has loadings on the E factor in the present study of more than 0·25; all have loadings on the N factor of between 0·25 and 0·58, with the median in the 0·45–0·49 interval. Looking at the E items of the original study, we find that only 3 have N loadings in excess of 0·25 (none as high as 0·35). E loadings range from one exceptionally low one of 0·13 to 0·62, with the median in the 0·40–0·44 interval. No item is in the wrong quadrant. These results suggest substantial similarity between the two studies, although the samples of subjects were quite different, and although the

matrix of items in which the M.P.I. items were embedded in the present study was not used at all in the original work. For the new items, i.e. those not contained in the original M.P.I., a prediction was made in each case as to the expected position of the item in the two-dimensional framework of the N and E factors; nearly all of these predictions were in fact borne out, although not always at acceptable levels of significance. Lengthy discussion of these predictions would not seem necessary

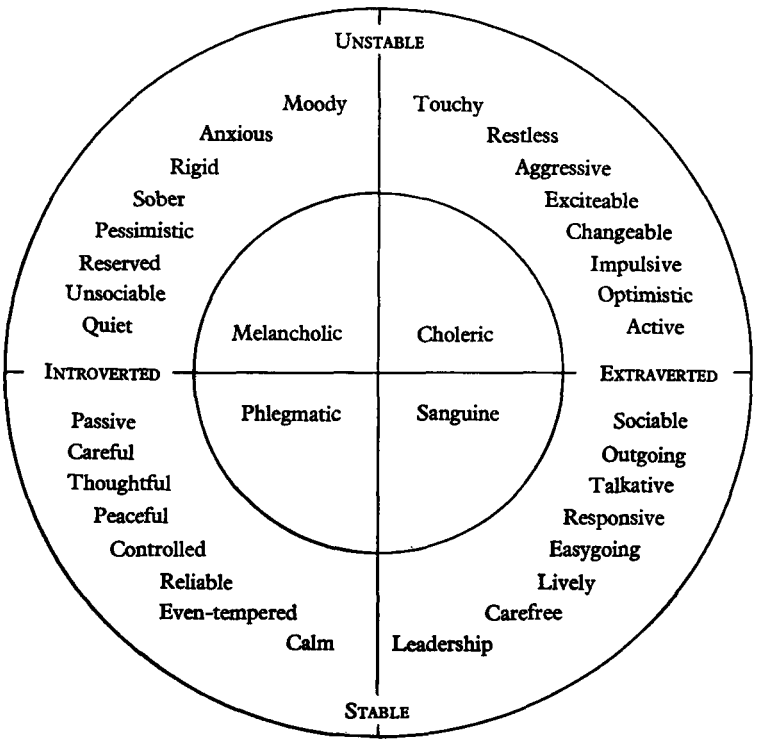

Fig. 1. Diagram showing approximate position of various traits in two-dimensional factor space. Also shown are the four classical 'temperaments' or 'humours', corresponding to the four quadrants.

as they are all rather obvious, can mostly be deduced from the general theory of extraversion and neuroticism (Eysenck, 1957), and have indeed been discussed at various times (Eysenck, 1960*a*, *b*).

4. RESULTS

The results of the validation study are given in Appendix Table 1, which lists the items on which factor loadings were available, D_E and D_N scores, and E and N factor loadings. These detailed results, to which reference will be made in the discussion, can be summarized conveniently in the form of four correlations. D_E correlates 0·883 with the E loadings, and −0·270 with the N loadings; D_N correlates 0·676 with the N loading, and −0·525 with the E loading. (Correlations of 0·17 and 0·23 are significant at the 5 and 1 % levels respectively for N = 124.) We thus find that in

both cases the predicted positive relation between D_E and E loading, and D_N and N loading, is indeed observed, assuming a very high value in the former case; in addition, however, there is also a less welcome correlation of considerable magnitude between D_N and the E loading (and to a much lesser extent between D_E and the N loading.) These require some detailed discussion.

5. Discussion

It is possible to formulate an hypothesis to account for the apparent tendency of judges to choose their N and S groups in such a way that these two groups are also differentiated in terms of introverted and extraverted questionnaire answers. Such an hypothesis may suitably start with a finding reported by Eysenck (1956) regarding the allegedly unitary personality trait of sociability (Guilford & Guilford, 1936). Using Guilford scales R and C respectively as measures of extraversion and neuroticism, a procedure justified on empirical grounds elsewhere (Eysenck, 1960*a*) he proceeded to test the hypothesis that items in Guilford's S (social shyness) scale would break up into two groups—introverted shyness and neurotic shyness. Put briefly, this hypothesis suggested that 'the introvert does not *care* to be with other people; the neurotic is *afraid* of being with other people' (Eysenck, 1956, p. 121). Two analyses were done, using groups of 200 men and 200 women; for the men it was found 'that *none* of the items showing a significant relation with R shows a significant relation with C. Similarly, not one of the items showing a significant relation with C shows a significant relation with R. With the exception of one item the same is true for the women'. A detailed analysis of the items revealed that 'the sociable extravert lets himself go and has a hilarious time, likes to mix socially,...is a good mixer who does not stay in the background on social occasions, who takes the initiative in making friends, has many social engagements...etc. In other words, he is a person who enjoys social intercourse with people as opposed to the introvert, who does not enjoy social intercourse with people. When we turn to the items indicative of neurotic social shyness we find the shy person troubled about being self-conscious, experiencing periods of loneliness, troubled with feelings of inferiority and self-conscious with superiors, worrying about humiliating experiences, and about being shy, ill at ease with other people, and not well poised in social contacts. In other words, we meet a kind of person who is troubled and worried over his social contacts, and would like to be more adequate in his dealings with other people, but whose emotional reactions seem to interfere with his social adjustment' (p. 124).

These two types of social shyness are of course easily differentiated by introspection, and consequently accessible to questionnaire probing, but they are confounded when we apply a simple behavioural criterion, as both lead to non-social behaviour, however different the underlying motivation. Thus to the observer social shyness will often appear to be associated with neuroticism, as well as with introversion, and he will be unable in most cases to distinguish 'introverted shyness' from 'neurotic shyness'. Thus our judges, in choosing the N and S groups, might have been expected to have based their choice partly on overt lack of sociability in the candidates they selected as members of the N group. It is likely that in doing this they selected erroneously a number of unsociable introverts. For these individuals the D_N scores

should be high on 'introverted social shyness' items; at the same time these items would have high negative loadings on extraversion.

Let us now look at the items in the questionnaire having loadings of $-0{\cdot}35$ or more on extraversion, and D_N scores of 10 or higher. There are 8 such items: they deal with keeping in the background on social occasions, being quiet in a social group, being shy with persons of the opposite sex, limiting one's acquaintance to a select few, having difficulties in 'losing oneself' at a lively party, being remote and distant except with intimate friends, being naturally reserved, and tending towards pessimism. With the exception of the last item (which only just qualified for inclusion in this group) all are indeed, as expected, 'social shyness' items of the introverted kind, with uniformly low neuroticism loadings (all are below 0·27) and uniformly high D_E scores (ranging from 17 to 28). In the opposite quadrant (high E loading, low D_N scores) there are only 4 items if we use the same criterion as before, to which may perhaps be added another 4 which are only slightly outside the area specified. These 8 items deal with preferring rapid action, being (and being regarded as) lively, being able to have a good time at a party, liking to mix with people socially, being happy-go-lucky, being talkative, and keeping in close touch with things around one. These items are rather more mixed, only 3 obviously belonging to the 'sociable extraversion' kind. On the whole, however, the data seem to bear out the hypothesis quite well.

If this conclusion is acceptable, it follows that the discrepancies between ratings and self-ratings are in effect more likely to argue against the acceptance of the ratings, as these confound two possible causal determinants of observed 'sociable' and 'unsociable' behaviour. Thus the results of this experiment suggest unambiguously that as far as *extraversion* is concerned, self-ratings and behaviour as rated by others agree well; as far as neuroticism is concerned, the picture is rather less clear, but if our argument be accepted, then we may regard the self-ratings as valid, and the ratings as rather less so. This conclusion is in good agreement with the theory put forward by S. B. G. Eysenck (1962) that 'extraverted behaviour is more easily observable by the outsider, whereas neuroticism is more characterized by subjective internal conditions, such as anxiety and other conditions, which may not give rise to observable differences in behaviour'. It may finally be suggested that the method of nominated groups may be of considerable use in analysing problems of validity in this field.

A final word may be permitted regarding the results of this and previous factor analyses, as diagrammed in Fig. 1. Eysenck (1960*a*) has elsewhere drawn attention to the curious fact that different investigators, such as Guilford and Cattell, starting with a universe of items not very different one from the other, arrive at some 16 or so 'primary factors' which are in no way similar; when these factors themselves are correlated (within each system) and factor analyses are performed, however, both solutions give rise to very clear-cut neuroticism and extraversion factors. The tentative solution to this problem given in the earlier publication may be illustrated by reference to the alleged personality trait (first-order factor) of 'rigidity'. When this was investigated in detail, it appeared that self-rated 'rigid' behaviour was entirely a function of introversion, neuroticism, and low intelligence (Eysenck & Eysenck, 1962): 'rigidity as a trait independent of these second-order concepts has no existence or

statistical meaning'. It is theoretically possible too chose any small sector of Fig. 1, sample the universe of questions in this sector, and arrive at a factor or trait which can be named and which makes obvious 'sense' in terms of everyday behaviour and language. It is certainly possible to attribute the observed correlations to such a hypothetical trait; it would, however, be equally possible, and more parsimonious, to attribute them to the fact that points in a particular circumscribed region of the diagram have similar loadings on our two reference factors. It would follow from this second hypothesis that by suitable sampling (i.e. by slight shifts of the sector chosen for investigation) one would be enabled to extract an infinite set of first-order factors or 'traits' from the whole universe of questions; this indeed appears to have happened in the sets of investigations carried out by Guilford and Cattell. It seems likely that slight differences in item sampling are responsible for the emergence of distinct sets of traits from their otherwise closely comparable investigations. In spite of such disagreement in the field of first-order factors, however, it would follow from our hypothesis that second order factors should be closely similar, and should also be similar to the N and E factors as measured by the M.P.I. Other empirical findings which can be explained in terms of such a conception are those of Peterson (1960) that when a correlational test of factor similarity was applied to the results of Cattell on the factorial structure of personality in children and adults, much greater similarity of structure was observed when the analysis was carried out in terms of E and N than when Cattell's set of primary factors was used.

It is not denied, of course, that after the extraction of E and N from a matrix there may remain clusters of correlations identifying traits which have objective existence over and above the communality achieved through the fact of similar E and N loadings. What is suggested is rather that the existence of such clusters must remain an empirical problem which cannot be solved by simply assuming their existence; in our experience the matrices of residual correlations after the extraction of E and N tend to be remarkably similar to matrices entirely due to chance factors. This may in part be due to our endeavour to sample items relevant to the E and N factors, and it is not considered that the existence of further factors is in any sense ruled out by our findings.

There is, however, another consideration which must not be neglected; this relates to the psychological status, as opposed to the statistical status, of first- and second-order factors in this field. We would maintain that personality traits are best regarded as 'habits', thus reducing these imperfectly understood concepts to a more basic and better understood type of variable. Habits are typically evanescent, changing, and difficult to classify, and traits are notorious in presenting similar difficulties. However, E and N may be regarded as being at an altogether more fundamental level. Eysenck (1957, 1960*a*) has argued in favour of constitutional differences in the formation of excitatory and inhibitory potentials as being the underlying cause of introverted and extraverted behaviour patterns, and of constitutional differences in autonomic lability as being the underlying cause of neurotic and stable behaviour, and it would seem to follow that E and N have a different conceptual status in psychology from that achieved by the shifting and purely descriptive 'traits' identified by factor analysis. It is of course realized that these constitutional factors interact with environmental events to produce the final habit family hierarchies which constitute personality

(Eysenck, 1960*c*), but nevertheless they must be assumed to exert a powerful and possibly decisive influence on behaviour. Without some such theoretical referent outside the closed circle of correlational analysis, it would clearly be impossible to break out of this circle and relate statistical factors in any meaningful way to psychological theory generally, and experimental psychology specifically. Fig. 1 illustrates fairly clearly that the hope of finding an *infallible* criterion in 'simple structure' must end in disappointment; every part of the plane generated by the E and N vectors is 'inhabited', as it were, and it follows from our theory that this should be so. In this, personality description (in terms of 'traits') differs, perhaps fundamentally, from the analysis of ability. It is not impossible, however, that purer measures of E and N, such as those developed by Eysenck (1957, 1960*a*; 1962*c*) may define these two factors much more clearly, and make possible the use of Thurstone's criteria of rotation.

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Appendix Table 1

The 124 items on which factor loadings were already available out of the 170 items in the questionnaire completed by the nominated groups.

E, N, extraversion and introversion loadings from a separate group of 300 subjects.
D_E, no. of endorsements by nominated extraverts *less* endorsements by nominated introverts.
D_N, no. of endorsements by nominated neurotics *less* endorsements by nominated stable subjects.
N = 100 nominated subjects, in four groups of 25.

		Loading			
		E	N	D_E	D_N
1.	Do you sometimes say the first thing that comes into your head?	0·244	0·183	15	0
2.	Can you usually solve a problem better by studying it alone than by discussing it with others?	−0·252	0·004	−21	10
3.	In a group, do you hate having to introduce people to each other?	−0·339	0·366	−16	11
4.	Do you very much enjoy good food?	0·442	−0·060	1	−5
5.	Are you a person who is not much given to cracking jokes and telling stories to your friends?	−0·363	0·035	−20	9
6.	Do you often crave excitement?	0·450	0·240	19	18
7.	Do you frequently forget people's names and phone numbers?	−0·190	0·165	−5	−4
8.	Can you put your thoughts into words quickly?	0·138	−0·347	11	−5
9.	Do you enjoy practical jokes?	0·282	−0·045	4	5
10.	Do you find it hard to tell anyone about yourself?	−0·206	0·246	−16	10
11.	Would you say you are the type to fall in and out of love easily?	0·307	0·206	5	7
12.	Do you have to be careful to keep from being too aggressive or domineering?	0·253	0·138	5	−2
13.	Do you mostly succeed in keeping the expression of your feelings under very good control?	−0·107	−0·127	2	−7
14.	Would you rate yourself as an impulsive individual?	0·501	0·293	26	2
15.	Do your friends regard you as very reliable, i.e. likely to keep appointments, not forget errands, etc?	−0·125	−0·192	−1	−2
16.	When you are drawn into a quarrel, do you prefer to 'have it out' to being silent hoping things will blow over?	0·242	0·060	6	3
17.	Do you mind selling things, or soliciting funds for a cause in which you are interested?	−0·217	0·085	−16	5
18.	Do you like to be in a situation with plenty of excitement and bustle?	0·475	−0·010	31	−9
19.	If you want to learn about something, would you rather do it by reading a book on the subject than by discussion?	−0·240	0·036	−15	12
20.	Do you often act on the spur of the moment without stopping to think?	0·521	0·404	20	4
21.	Are you reserved and distant except to intimate friends?	−0·479	0·183	−25	14
22.	When the odds are against your succeeding in some enterprise, do you think it worth while to take a chance?	0·333	0·046	8	0
23.	Can you readily get some life into a rather dull party?	0·484	−0·130	27	−4
24.	If you were among several witnesses to an accident, would you be likely to take charge?	0·141	−0·276	0	−4
25.	Do you sometimes quite enjoy doing dangerous things?	0·190	0·030	14	−4
26.	Do you like to have constant change in the kind of work you do?	0·071	0·021	9	−1
27.	Are you ordinarily a carefree individual?	0·513	−0·259	18	−16
28.	Do you prefer people who keep an open and hesitant mind for a long time to those who know at once exactly where they stand on issues (and even jump to conclusions)?	−0·183	0·164	−5	17

Appendix Table (*cont.*)

	Loading			
	E	N	D_E	D_N
29. Do you sometimes sulk?	0·047	0·414	−3	0
30. Do you find it very difficult to take no for an answer even when it is obviously impossible to do what you want?	0·192	0·393	8	4
31. Do you like working alone?	−0·497	−0·097	−13	6
32. Do you enjoy opportunities for conversation so that you rarely miss a chance of talking to a stranger?	0·366	−0·006	23	9
33. Do you have difficulty in falling asleep easily at bedtime?	−0·353	0·199	−5	3
34. Do you like to try fancy dishes?	0·295	−0·130	10	−8
35. Are you inclined to stop and think things over before acting?	−0·443	−0·192	−17	6
36. Do you tend to be slow and deliberate in movement?	−0·338	−0·002	−9	1
37. Do you often need cheerful, sympathetic company to cheer you up?	−0·054	0·458	5	25
38. Do you feel it essential to plan ahead carefully before beginning any undertaking?	−0·405	−0·027	−4	0
39. Have you the tendency to elaborate and exaggerate an event when talking to friends about it afterwards?	0·122	0·162	6	2
40. On the whole, do you prefer the company of books to people?	−0·393	0·040	−9	−1
41. Would you hesitate to complain to a waiter or the manager if you are served bad food in a restaurant?	−0·178	0·330	−14	2
42. Do you usually keep in close touch with things going on around you?	0·292	−0·192	7	−16
43. Do you get tired easily when you are doing a repetitive job?	0·179	0·159	12	−2
44. Do you hate being with a crowd who play jokes on one another?	−0·327	0·012	−2	4
45. If you are annoyed by something, do you find it absolutely necessary to talk to somebody to 'let off steam'?	0·365	0·330	20	2
46. Do you dislike doing more than one thing at a time?	−0·102	0·284	−12	14
47. Is your motto to take matters of everyday life with proper seriousness rather than to 'laugh and be merry'?	−0·451	0·116	−24	0
48. Would you rate yourself as a hardy type of person?	0·195	−0·162	11	−10
49. Do you prefer a well-ordered mode of life with regular hours and an established routine?	−0·065	0·026	−8	17
50. When arguing do you tend to raise your voice?	0·332	0·287	16	−2
51. Do you tend towards an over-cautious pessimism?	−0·382	0·255	−17	13
52. Do you often have a restless feeling that you want something but do not know what?	0·151	0·552	8	9
53. Would you describe yourself as an easy-going person not concerned to be precise?	0·340	−0·087	12	5
54. Do you prefer romantic stories to adventure stories?	0·035	0·265	2	5
55. Do you find that your interests tend to change rather rapidly?	0·282	0·234	11	2
56. Would you feel uncomfortable in anything other than fairly conventional dress?	−0·043	0·212	−3	9
57. Are you a very ticklish person?	0·144	0·202	15	−1
58. Do you do many things that make you feel remorseful afterwards?	0·206	0·518	−5	5
59. Do you tend towards a rather reckless optimism?	0·513	0·115	25	−3
60. Would you do almost anything for a dare?	0·452	0·015	15	−4
61. Do you usually avoid 'sticking your neck out'?	−0·135	0·189	−9	9
62. Do you go about your business rushing actively from one thing to another, e.g. eating fast, walking fast, etc.?	0·103	0·142	9	−2

Appendix Table (*cont.*)

	Loading			
	E	N	D_E	D_N
63. Do you prefer to dress soberly and correctly rather with a 'bit of a splash' that will make people take notice?	−0·144	0·108	−14	5
64. Do you like to keep moving around and doing things most of the time?	0·223	0·056	10	−5
65. When people shout at you, do you shout back?	0·376	0·247	0	−2
66. Would you rather have a job with a fixed secure and modest salary than one with a larger salary but irregular earnings depending on luck and your enterprise in making contacts?	−0·066	0·106	−15	12
67. Do you lose your temper easily, but get over it quickly?	0·205	0·291	10	−2
68. Other things being equal, would you prefer the job of a farmer to that of a life insurance salesman?	−0·342	−0·64	−14	0
69. Are you given to acting on impulses of the moment which later land you in difficulties?	0·458	0·474	28	2
70. Are you often annoyed by being temporarily prevented from doing something?	0·220	0·331	7	13
71. Do you sometimes slam doors when you are angry?	0·287	0·265	−4	16
72. Would you rather spend an evening by yourself than go to a dull party?	−0·383	0·041	−14	−1
73. Do you, at times, feel like picking a fight with someone?	0·234	0·245	−1	7
74. Do you often feel that you must discuss something you have read before you will really understand or remember it?	0·363	0·223	5	2
75. Does your natural reserve generally stand in your way when you want to start a conversation with an attractive stranger of the opposite sex?	−0·516	0·207	−25	16
76. Do you often sing or hum when you are by yourself?	0·254	0·267	5	2
77. Are you happiest when you get involved in some project that calls for rapid action?	0·397	−0·123	26	−10
78. Do you sometimes feel happy, sometimes depressed, without any apparent reason?	0·115	0·584	7	7
79. Does your mind often wander while you are trying to concentrate?	0·165	0·460	14	5
80. Do you usually take the initiative in making new friends?	0·543	−0·140	28	−5
81. Are you inclined to be quick and sure in your actions?	0·224	−0·178	23	−11
82. Are you frequently 'lost in thought' even when supposed to be taking part in a conversation?	−0·153	0·378	−2	12
83. Are you sometimes bubbling over with energy and sometimes very sluggish?	0·190	0·501	5	16
84. Would you rate yourself as a lively individual?	0·555	−0·230	24	−11
85. Would you be very unhappy if you were prevented from making numerous social contacts?	0·474	0·123	23	3
86. Are you inclined to be moody?	−0·118	0·534	−8	15
87. Do you have frequent ups and downs in mood, either with or without apparent cause?	−0·132	0·554	2	10
88. Do you prefer action to planning for action?	0·382	0·084	17	−5
89. Are your daydreams frequently about things that can never come true?	0·003	0·458	4	9
90. Are you inclined to keep in the background on social occasions?	−0·621	0·223	−25	26
91. Are you inclined to ponder over your past?	−0·164	0·415	−3	28
92. Is it difficult to 'lose yourself' even at a lively party?	−0·372	0·193	−22	15
93. Do you ever feel 'just miserable' for no good reason at all?	0·132	0·557	−2	11
94. Are you inclined to be over-conscientious?	−0·244	0·274	−9	11
95. Do you often find that you have made up your mind too late?	−0·011	0·475	−3	12

Appendix Table (*cont.*)

		Loading			
		E	N	D_E	D_N
96.	Do you like to mix socially with people?	0·492	−0·170	23	−8
97.	Have you often lost sleep over your worries?	−0·050	0·509	−6	16
98.	Are you inclined to limit your acquaintances to a select few?	−0·504	0·171	−21	12
99.	Are you often troubled about feelings of guilt?	0·068	0·543	−12	20
100.	Do you ever take your work as if it were a matter of life or death?	−0·134	0·152	−24	11
101.	Are your feelings rather easily hurt?	−0·050	0·492	−3	16
102.	Do you like to have many social engagements?	0·543	0·002	29	0
103.	Would you rate yourself as a tense or 'highly strung' individual?	−0·068	0·452	−3	17
104.	Do you generally prefer to take the lead in group activities?	0·248	−0·326	16	−6
105.	Do you often experience periods of loneliness?	−0·031	0·460	−2	11
106.	Are you inclined to be shy in the presence of the opposite sex?	−0·427	0·263	−19	21
107.	Do you like to indulge in a reverie (daydreaming)?	−0·142	0·360	8	11
108.	Do you nearly always have a 'ready answer' for remarks directed at you?	0·332	−0·163	19	−6
109.	Do you spend much time in thinking over good times you have had in the past?	0·117	0·368	8	18
110.	Would you rate yourself as a 'happy-go-lucky' individual?	0·623	−0·126	30	−9
111.	Have you often felt listless and tired for no good reason?	0·007	0·584	−1	13
112.	Are you inclined to keep quiet when out in a social group?	−0·584	0·217	−28	23
113.	After a critical moment is over, do you usually think of something you should have done but failed to do?	0·097	0·476	−8	11
114.	Can you usually let yourself go and have a hilariously good time at a gay party?	0·536	−0·218	29	−14
115.	Do ideas run through your head so that you cannot sleep?	−0·165	0·344	−11	15
116.	Do you like work that requires considerable attention?	−0·223	−0·087	−3	−3
117.	Have you ever been bothered by having a useless thought come into your mind repeatedly?	−0·058	0·324	−21	29
118.	Are you inclined to take your work casually, that is as a matter of course?	0·208	0·096	10	0
119.	Are you touchy on various subjects?	0·126	0·368	−5	27
120.	Do other people regard you as a lively individual?	0·576	−0·077	18	−13
121.	Do you often feel disgruntled?	−0·088	0·559	−6	20
122.	Would you rate yourself as a talkative individual?	0·384	−0·035	30	−8
123.	Do you have periods of such great restlessness that you cannot sit long in a chair?	−0·035	0·419	0	19
124.	Do you like to play pranks upon others?	0·283	0·004	8	−1

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