

A SHORTENED "BASIC ENGLISH" VERSION (FORM C) OF
THE 16 PF QUESTIONNAIRE*

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A. HOW REALISTIC IS THE GOAL OF SHORTENED TESTS?

To be realistic about the unrealistic attitudes of test-users, one must admit the existence of a widespread demand that any test shall be both extremely short and extremely reliable! Now Forms *A* and *B* of the Sixteen Personality Factor Questionnaire (8) have 10 and 13 items per factor, and reach a mean coefficient of equivalence, i.e., mean for the typical factor, of 0.51, and a mean split-half consistency coefficient (corrected to the full 20 or 26 items) of 0.69. But this tolerable reliability requires about three minutes per factor or three-quarters of an hour of test time per form, i.e., an hour and a half for the full length test, or even longer with slower readers.

From the standpoint of information theory an hour and a half is not much to ask for 16 independent and reliability-checked "bits" of psychological information. The ordinary intelligence test, after all, usually takes an hour to give data on only one of these factors. But the harassed industrial psychologist—and, alas, sometimes also the clinician—are apt to protest that this is more time than they can give. Probably they should turn to their administrative masters and point out that nothing very valid or reliable is likely to be found out about so complex a matter as individual personality by going through a ritual of inadequate testing. The hour "saved" by substituting a futile test for a longer, well-designed one may cost—as in an instance known to the writer—ten thousand dollars—for this can easily be the difference over a year or two between the production under a poor and a well selected executive.

Let us face the fact that the demand of the applied psychologist both to eat his cake and have it, usually results decidedly in his not having it. He goes through the motions of administering psychological tests and has to be satisfied with a pretty set of figures—apparent measurements. Very rarely can he demonstrate the real control of the situation that would result if test theory and practice were taken seriously. To give effective prediction, a test

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should cover the chief independent dimensions of personality, of which at least 16 to 20 are now measurable (15) and should reach a minimum reliability of 0.5 on these. If a test *must* be short, say, 100 items instead of the 354 items on the combined *A* and *B* forms of the 16 PF, then *it is better to sacrifice reliability rather than to give up an efficiently wide and even sampling of the principal dimensions of personality*—as information theory clearly shows (13).

It would admittedly be a fine thing if the measurement of 16 to 20 factors by questionnaire could be cut down to 100 items, i.e., roughly 6 per factor, without seriously lowering the reliability and validity of the factor measures. There are some inherent difficulties, but presumably it could be achieved if enough research were done to select the *right* six items. The history of research certainly shows that such short measures can be made effective on specific attitudes and interests; but a broad personality dimension is not a specific attitude. By its very nature it has to be sampled *broadly*, and therefore by using items each of which has an appreciable undesired specific in it. Or, in other words, there is sufficient tendency for the source trait to have individual peculiarities of manifestation to make it necessary to avoid depending on the average of a very few, specific items. In short, there *are* intrinsic difficulties which make it unlikely that research will find the ideal, highly saturated items. The chief of these is that they probably do not exist! But although real brevity may not be even *theoretically* obtainable with well nigh perfect reliability and validity, yet a practicable level of validity and reliability may reasonably be sought.

B. THE "PACKAGING" PLAN FOR ECONOMICAL FACTORIZATION

The above may seem a strange preamble to a research report intent on the development of a short test! But our point is that one must undertake such an enterprise open-eyed to the fact that he is preparing a test of lesser validity and reliability than the full length test. He is maintaining the sense of proportion that it is better to sacrifice items per factor than to sacrifice factors.

Since the demand for a shortened form of the 16 PF has been great, we decided, in fact, to aim at a third, *C* Form, of the test drastically cut down to 100 items, and requiring only 20 minutes for its administration. The situations in which a shorter form is requested tend to coincide with those in which a lower level of literacy is to be expected and we decided accordingly to make the *C* Form differ from the *A* and *B* forms both by being shorter and also by making minimal demands on education and vocabulary.

In addition, the questions themselves were made briefer than those in previous use, thus saving testing time in a different way. In view of the growing use of the translated 16 PF in eight countries, and the larger pool of research reference which that makes possible, the additional aim was taken of choosing culture-common, more reliably translatable items than formerly.

The initial step, therefore, was that of making a sufficient pool of psychologically suitable items, meeting the above specifications. The psychological guidance in making up the items came from the whole system of research on the nature and meaning of personality factors available in the past decade (1, 2, 3, 4, 6, 9, 10, 15). That is to say, items were made up for each of the known personality factors in behavior ratings and in questionnaire material, care being taken to seek relatively "pure" representations of each factor in behavior. Various members of the laboratory, with specific knowledge of the processes in particular factors participated, and a list of 450 items was produced. This was given to an initial, small population of 80 young adults (mixed students and airmen) simply to eliminate items on which any ambiguity of meaning was reported, or on which either the yes or the no responses constituted less than 10 per cent of all responses. The resulting list of 300 items we shall call the Extension Questionnaire No. 1 (to distinguish from Extension No. 2, described elsewhere).

Now it was the intention of our design to found the *C* Form upon an independent factorization, not merely to build it up by the cheap but doubtful process of setting up the factor meanings by extending the factor determinations of the existing *A* and *B* forms. To pick items for the corresponding *C* form factors entirely on their correlation with existing *A* and *B* factors would take little time and would give the appearance of good agreement among the forms, but would in fact perpetuate any distortions, specificities, or defects of rotation in the existing *A* and *B* factors.

On the other hand, to factorize as many as 300 items "from scratch" presents an almost insuperable undertaking, so we adopted the following abbreviating devices. First we correlated the Extension items with the existing questionnaire factors, representing each factor twice (by its *A* and *B* forms separately) for greater reliability of evidence. The intelligence factor was of course omitted, since items for it can readily be obtained from other sources. From inspection of the resulting 30×300 correlation matrix we attempted to pick up extension items having substantial correlations with the existing factors.

The second step in the design called for factor analyzing the items thus shown to have appreciable relevance to the 16 PF personality space, along

with the *A* and *B* forms of the original test. *This would both structure the new items independently and provide checks and corrections on the factor structure of the original 16 PF factorization.* Choosing Extensions items which had appreciable projection on the factor space of the 16 PF guaranteed items with real relevance to the principal known dimension of personality without precluding the appearance of new dimensions, since fresh factor analysis of these items would reveal whatever existed.

In this factor analysis it was proposed to use the economy of a new device which may be called "packaging," in which items are first factorized in small blocks or packages, and the packages are then undone for a separate calculation of the factor loadings of the individual items, as described in the following section.

C. OUTCOME OF THE FACTOR ANALYSIS

Inspection of the 30×300 matrix revealed that greater success had been achieved in making up new items for some factors than for others, presumably due to better insight into the nature of these source traits. Consequently, since we wished eventually to have as many new items for one factor of the *C* Form as for any other, namely 6, it was necessary to accept different levels of "goodness" for different factors. Thus, the goal was accepted of bringing in nine new items for each factor, on the assumption that a third of these would be lost in meeting the standards of the subsequent factorization.

The mean *r*'s with the factor, for these nine items imported for each from the Extension Questionnaire, ranged from .21 in the case of Factor Q_2 , through .36 for Factor *E*, to .64 for Factor *C*. But in all cases they were significant beyond the 1 per cent level for the population of 295 used at this stage of the research. We are especially indebted to Dr. G. M. Guthrie, of the University of Pennsylvania, for supplying us, in the course of his own researches with the 16 PF, with adequate mixed undergraduate populations for this study.

The 126 Selected Extension items thus obtained (there proved to be no significant new items for Factor Q_1 and only enough for one new package on *N*) were now "packaged" for the economized factorization by grouping the nine items available for each factor in three groups of three. It was assumed that the degree of homogeneity obtained by picking these nine items for significant, consistent correlation with the existing *A* and *B* form factors, and for absence of significant correlation with other factors, justified the hope that a package would behave in a fairly unitary fashion, i.e., that items

would not mutually cancel loadings and that the package, treated as a single variable, would be likely to have decided loading on one factor.

Our hypothesis at this point could be stated by saying that using these packages as single variables, along with packages constituted by the existing *A* and *B* forms of the factor, should yield five variables significantly loaded on each of 15 factors. Thus for a given Factor *X* we should expect to find five significantly loaded variables, viz: *XA*, *XB*, *Xa*, *Xb*, and *Xc*, the two first being the present *A* and *B* forms and the three last the scores on each of the three packages of three items. All but these five variables (the rest being 67 in number) should, with respect to any one factor, fall in or near the hyperplane, thus offering a very firm basis for a good simple structure determination.

The correlation matrix for the above 70 variables was based on a population of 295 men and women undergraduate students and was worked out in terms of the coefficient ϕ/ϕ maximum, which has been shown to be less prone to develop spurious "eccentricity factors" (5) than other indices, and which is susceptible to rapid I.B.M. computing. Thirteen factors were taken out of this matrix by the multiple group method (5), carried to four iterations of communalities. Two more were then taken out of the residuals, still significant, by the centroid method, which permits a better determination of the end of extraction and in this case indicated that the fourteenth or fifteenth factor was the last needing extraction.

Rotation for simple structure was carried out blindly, as usual, cryptic numbers being substituted for the above *XA*, *XB*, *Xa*, *Xb*, and *Xc* symbols. A good structure was relatively rapidly obtained, and after 11 over-all rotations the hyperplane frequencies reached a firm plateau. The rotated factor matrix is set out in Table 1 and the angles among the reference vectors in the form of cosines in Table 2. The unrotated matrix and the transformation matrix are on file at the A.D.I. Auxiliary Publications Project Library of Congress and may be obtained by reference to Nos. — —. It will be observed from Table 2 that there are some slight but definite correlations among the factors. Since the definiteness of the simple structure is the best the experimenters have seen in a dozen preceding studies, it is probable that these obliquenesses do not represent any indeterminateness of the hyperplanes but express real correlations among the personality factors.

TABLE 1
ROTATED REFERENCE VECTOR MATRIX
16 PF—Form C

Variables*	Factors ²															
	A	E	C	F	G	I	L	M	N	Q ₁	Q ₂	H	Q ₄	O	Q ₂	55
AA	53	-04	09	01	05	-05	-01	06	-03	16	-04	-01	09	01	-24	55
AB	66	-07	05	02	-12	01	-06	05	13	-13	02	-15	-08	07	-07	70
Aa	-03	17	-03	-23	03	-05	-10	02	02	15	-09	-04	02	-07	-25	20
Ab	45	10	-10	-32	-01	09	-04	-09	-04	07	02	08	-22	-06	-01	41
Ac	11	03	04	-06	-11	-03	02	-07	-07	-13	09	10	-15	00	-05	11
CA	-12	-05	37	08	-01	01	-03	23	07	03	-00	-13	-08	-12	-06	35
CB	10	04	44	-02	-03	-04	09	06	-03	06	-00	-05	-15	-07	-06	35
Ca	-01	06	25	01	-21	11	00	-03	02	-04	04	35	-16	-05	-03	34
Cb	05	13	51	05	07	-01	-07	01	-12	03	-09	-34	04	08	05	55
Cc	-07	-19	02	-02	-04	-04	-23	27	10	03	-05	-10	04	-03	-04	24
EA	-03	23	09	06	-01	-05	10	-06	-03	21	05	-05	05	-00	05	24
EB	08	27	-07	08	01	-10	-02	04	-00	-04	-04	07	-11	-01	-06	25
Ea	-05	41	-11	-02	-06	09	-09	-06	23	-16	-13	-07	-03	05	-14	43
Eb	-05	36	05	01	03	13	06	12	-01	-05	-07	07	08	-04	02	26
Ec	-06	17	17	-05	-09	-13	02	02	02	08	00	07	07	-07	09	20
FA	-01	-07	01	44	-05	-01	03	-06	09	02	-10	22	06	11	-02	33
FB	04	01	-05	61	-02	02	-19	04	-12	-08	-08	-07	-09	-03	-09	66
Fa	-16	-05	-06	34	05	08	09	06	03	-12	10	20	19	03	03	24
Fb	10	-04	-16	01	-11	-02	06	08	03	-01	-05	14	-05	00	-08	11
Fc	02	08	-06	33	15	10	07	-11	01	05	-12	-15	-05	08	06	30
GA	04	15	-03	-13	46	10	-01	02	03	03	27	-05	-00	-03	-00	35
GB	-01	-04	00	05	35	-12	06	04	01	01	09	40	-11	-01	05	40
Ga	09	-30	-26	12	06	-06	23	-00	01	03	-02	-21	12	-15	-10	44
Gb	03	-05	08	10	46	-02	-07	-05	04	02	-02	10	02	05	06	32
Gc	-15	21	14	03	24	06	09	-03	-13	-08	-01	-11	-01	-07	-15	28
HA	13	-02	-01	42	-01	01	-01	09	-01	12	02	58	-15	08	04	60
HB	17	10	09	38	10	05	05	15	03	05	27	41	-14	05	02	51
Ha	04	-07	05	25	-07	05	-12	-10	08	-06	05	38	-06	01	-16	31
Hb	07	-08	12	25	03	-02	07	33	06	12	04	26	03	12	-11	31
Hc	05	02	16	24	02	00	01	00	23	-21	-05	34	04	07	-09	33
IA	10	05	-24	-05	03	50	19	00	01	12	-05	10	-26	16	05	67
IB	01	05	05	12	-03	41	00	-08	-05	10	09	-44	15	10	02	50
Ia	15	04	-02	-10	-01	16	06	02	14	-08	13	-31	19	-02	06	27
Ib	-01	11	-09	-08	-11	42	-05	03	07	07	-07	01	03	02	-06	32
Ic	05	-06	-09	03	04	32	-03	01	-04	00	-04	00	-04	-03	-14	33
LA	-03	04	-21	07	09	-04	20	06	-05	08	-05	-10	13	11	12	30
LB	-03	03	-08	-08	-02	07	63	-07	-01	08	08	43	02	-07	11	70
La	09	02	-14	-16	08	-03	02	09	-03	08	-03	-14	25	-09	-17	25
Lb	-02	-03	-40	-01	03	-04	32	05	-03	04	-10	06	14	-05	09	22

TABLE 1 (continued)

Variables*	Factors ²															
	A	E	C	F	G	I	L	M	N	Q ₁	Q ₃	H	Q ₄	O	Q ₂	
Lc	03	12	-11	-11	-04	-00	37	-08	-01	-06	-09	-02	12	-13	-04	33
MA	-04	-07	-37	10	-15	06	-06	15	-02	-06	-03	06	18	07	-09	38
MB	-04	-07	-16	-05	-10	22	10	33	04	06	17	-01	-08	-15	01	33
Ma	-04	-18	-11	04	04	07	01	16	13	10	-01	-14	16	07	08	18
Mb	-06	11	02	-03	-03	08	02	10	06	-02	-04	-04	-16	02	-13	07
Mc	02	06	-29	-02	-08	-03	01	36	-05	-35	04	-05	-02	-01	04	34
NA	-08	08	09	05	01	-11	05	-03	38	15	12	-08	-02	-09	09	39
NB	10	-02	-01	09	04	-05	-07	-07	09	09	-12	07	-24	02	-08	19
Na	01	-05	-14	-02	-06	07	-04	-19	48	04	04	09	06	-01	06	43
Oa	03	-05	-17	-06	-01	03	-04	07	-07	-03	-14	-11	52	10	-03	55
Ob	07	-12	-07	-14	-06	03	08	-08	03	09	-09	-03	51	09	04	55
Oa	-10	02	00	-04	-17	02	04	08	-09	-11	-28	-13	19	08	03	26
Ob	-00	-03	-21	-06	10	10	08	10	04	08	-14	-04	28	02	-02	35
Oc	-03	04	-01	-11	-03	25	05	-02	10	04	-03	-23	23	-01	02	24
Q _{1A}	02	-15	19	04	17	-03	10	05	12	-07	-11	02	03	05	-23	32
Q _{1B}	-10	-04	-01	01	04	05	-07	-05	03	41	08	07	05	05	04	23
Q _{2A}	-12	04	06	-14	06	04	-01	-00	09	14	-00	-13	11	02	38	33
Q _{2B}	-17	11	-07	-18	-02	04	-11	26	-05	-04	-09	11	-04	01	15	34
Q _{2a}	-03	-00	-04	-18	-01	02	-09	-01	01	31	-13	-12	00	-05	22	34
Q _{2b}	-10	14	02	-03	-05	07	06	-08	-08	-13	-06	16	-08	03	40	36
Q _{2c}	-11	-10	-09	08	-06	26	-06	-09	-15	17	02	03	-08	-12	19	25
Q _{3A}	01	-08	-02	-07	04	-12	-04	-08	06	05	26	-05	-42	-10	-03	45
Q _{3B}	-08	02	04	06	06	03	04	10	06	02	49	00	-15	-07	07	35
Q _{3a}	-12	-19	-11	06	-02	-01	-11	-01	01	12	34	33	-25	07	-01	45
Q _{3b}	02	-08	-04	06	-04	-12	-06	-00	-10	-18	40	06	-18	-04	-15	45
Q _{3c}	09	08	18	-05	-00	07	08	-09	08	00	34	07	-27	-12	01	36
Q _{4A}	04	-04	-14	-01	03	-09	01	02	02	04	-05	-08	56	07	-03	53
Q _{4B}	-05	-06	-31	-07	-18	-02	01	-10	-09	00	-04	03	34	5	-02	48
Q _{4a}	-07	-07	-22	-04	-02	04	21	-03	23	07	-31	-10	04	05	-10	42
Q _{4b}	-11	-13	-10	10	-00	-06	23	21	07	05	-01	-34	24	-02	-03	47
Q _{4c}	-03	-14	-19	-01	20	-03	03	27	34	17	-10	-07	35	04	-05	56
Numbers in ± Hyper- plane	55	48	40	49	55	55	57	56	56	48	51	39	33	60	52	

²The actual items corresponding to the variables Aa, Ab, Ac, etc., are shown in Table 3 below. The h² values are of course taken from the unrotated factor matrix.

D. THE FACTOR CORRELATIONS OF UNPACKAGED ITEMS

The re-factorization of the 16 PF has thus confirmed all but one of the original factors and the new material has structured itself within the same factors. The exception is Factor *O*, which has largely run into Q_4 . An entirely independent rotation, using the mechanical solution of the Quartimax method (20) agreed in all essentials with that given in Table 1, but

TABLE 2
COSINE MATRIX: ANGLES AMONG REFERENCE VECTORS

Factor	Factors															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
1																
2	-.01															
3	-.05	.26														
4	-.20	-.25	-.00													
5	.04	.20	.03	.08												
6	-.32	.35	.07	.15	.09											
7	.02	-.00	.08	-.03	-.05	.10										
8	-.08	-.15	.04	.08	.01	-.10	-.01									
9	-.06	.01	.09	-.09	.09	.16	-.03	.11								
10	-.24	-.01	.16	.03	.19	.27	.09	-.27	-.05							
11	.07	.03	-.16	.17	.06	.19	.08	.05	.10	.03						
12	.02	-.13	-.01	.27	-.03	-.12	-.00	.10	-.11	-.06	.05					
13	-.01	-.03	.31	.11	.19	-.14	-.16	.20	-.01	.06	.04	.05				
14	-.15	.07	.09	.10	.00	.03	-.22	.01	.15	.05	-.11	.08	.17			
15	.22	-.23	-.08	.12	.17	-.25	.06	-.15	-.13	-.13	.08	.07	.06	-.16		

suggested that the mixed Factor 13 is more Q_4 than *O*, so it is here considered Q_4 and Factor 14 is labelled *O*. The latter has poor loadings on the old *O*, though collectively better than on any other factor. The new *O*, which may therefore be somewhat different from the old, will have to be built up either by a special experiment searching for new *O* items or by special care in estimating the present factor despite its absence of substantial loadings.

Otherwise most "markers" fall exactly in the factors hypothesized, though there is some weakness in Q_1 in relation to Q_2 and some secondary loadings of markers for one factor in another in *C*, *F*, and *H* (the two last have been notoriously resistant to clean separation). It is important that no extra, unsuspected factors have appeared, and since this is not entirely precluded by our method of choice of variables, it supports the argument that the method of ensuring comprehensiveness of representation in the original study (3) was adequate.

According to the "packaging" design it now remained only to undo the packages and correlate their contents with the above factors. That is to say,

the estimate of each of the 15 factors was now correlated with the 26 (or 20) separate items in the *A* and *B* forms and the nine new items in the three packages, for that factor, making typically 35 correlations to be obtained with each of 15 factors. It will be seen that in this way we obtain the loading (or correlation) of each individual *item* that is likely to have any significant correlation with a factor, without the enormous labor of factoring the original 300-item Extension Questionnaire (plus the 354 items of the existing *A* and *B* forms!). Some information is lost, but none that we cannot afford to lose, while the danger of including an item in Factor X that has also a substantial loading in Factor Y is guarded against to some extent by the original 30×300 matrix and by declining to accept a package of three with a substantial loading in another factor. In the present case we watched the latter by including in the unpackaged individual items correlated with a factor not only the expected "marker packages" but any other with a significant loading. Thus all factors were correlated with at least 35 items but several, e.g., Q_2 with as many as 55.

The estimation of factors to obtain these correlations needed to be an unusually exact one, especially if we were to get anything out of Factor *O*, which is unquestionably an independent dimension, though poorly represented in variables. Consequently, the usual procedure of adding scores on the salient variables, even on weighted salient variables, did not seem good enough. Accordingly we followed the procedure of Thomson (19) which the writer has discussed in more detail elsewhere (11) in which each and every variable is made to contribute whatever it can toward stabilizing the factor estimate, i.e., it does not depend on salients only.

From the list of correlations of the factors with the individual variables, as shown arranged in their "package" groupings in Table 3, the six highest loaded items were to be picked out to represent each factor in the resultant *C* Form of the 16 PF. The items for the *A* and *B* forms, which also were correlated with the factor scores individually [partly for revision of the 16 PF Forms *A* and *B* (7)], are not set out here since they are known through the key in the Handbook (8). In Table 3 the index numbers of items are those of the original 300-item questionnaire and the responses set out are those to which a positive score was assigned. At the end are set out certain items borrowed from the *A* and *B* forms for the *C* Form [to be replaced in the revision of the former (7)]. This was necessary because, as shown in the following section, conditions of final construction did not always permit taking simply the six highest loaded items for the extension.

To avoid an additional table the loadings of the items in the factors for

which they were eventually used are entered on the right of Table 3 (no values are entered for those items too poorly loaded to have any specific factor affiliation in any factor). A formal listing of items attached to factors, arranged *under* factors, as derived from this table, is given in the Handbook for Form C (12).

E. SELECTIONS OF ITEMS AND LOADINGS FOR TEST CONSTRUCTION

The usual precautions in itemized test construction had next to be observed, namely, the avoidance of items substantially loaded in other factors than that desired (or the balancing of such loadings), the distribution of available good loadings equally among factors, the choice of as many "yes" [or (a)] as "no" [or (b)] alternatives in contributing to each factor score, the avoidance of obviously similar specific content, the selection of briefer questions among those otherwise equally eligible, etc. Furthermore, to give due weight to cross-validation in different population samples we adhered, when present weightings were about equal, to the item that had previously belonged in that factor (where *A* and *B* items were concerned). As indicated above, this produced slight changes from the simple choice of the six highest loaded items in each factor. It permitted us to use 70 of the 126 Extension items (Table 3) (which, it will be recalled, were already selected for *some* correlation with the factors) and these were brought up to the required number by borrowing 20 more from the *A* and *B* forms, as shown.

The 90 chosen items, consisting of 6 per factor, were now arranged in cyclical order for the final *C* Form questionnaire. Eight items for the sixteenth, "built-on" factor, *B*, general intelligence, were added, and these were chosen from a larger number (*a*) on the empirical basis of correct degree of difficulty and good correlation with the pool, in a group of 110 average adults, (*b*) to represent, about equally, classifications, analogies, synonyms, opposites, and problems (2 of each, except analogies and synonyms).

F. ADDITION OF MOTIVATIONAL DISTORTION SCALE

Since this questionnaire is intended for use in strongly motivated practical situations there remained to develop what we shall call a Motivational Distortion or "M.D." measure. No space exists here to survey the techniques of "lie scales" and suppressor variables, on the theory of which there exists much disagreement (16, 17). Briefly, we recognize distortion in questionnaire responses from the following sources: (*a*) the intention to present a favorable self picture in seeking a strongly desired job. This will differ from job to job, but may have a core of commonly distorted items. In a few

TABLE 3

Package symbol	No. in Ext. Ques.		Factor affiliation and loading		
Aa	192	Would you like a job which required you to sit at a desk all day?			
	206	Whom do you dislike more? a. Dishonest people. b. People who put on an affected "superior" attitude.			
	288	When you are introduced to someone would you rather? a. Have a friendly argument on basic social issues. b. Have him tell you a few jokes.	(a)	Q ₁	.25
Ab	100	Which would you rather be? a. A teacher. b. A policeman.			
	123	Do you believe that divorce should generally be made easier?			
	219	Would you like a job where you listen all day to complaints from employees or customers?	Yes	A	.33
Ac	257	Do you give yourself so much to do that you often have to drop one job to start another, and never quite catch up?			
	240	Are you attentive in keeping appointments, and keeping them on time?	Yes	A	.39
	108	Do you think that society ought to pay more attention to scientific thinking about its problems?			
Ca	151	Do you complain about bad service even sometimes when it is really satisfactory?			
	163	Have you ever come near fainting at a sudden pain or at the sight of blood?	Yes	G	.33
	285	Do you sometimes get so angry you are speechless?	No	H	.38
Cb	54	When you see "sloppy," untidy people do you a. Accept it? b. Feel disgusted and annoyed?	(a)	C	.30
	99	Have you ever walked or talked in your sleep?			
	179	Do you feel critical of most other people's work?	No	C	.49
Cc	14	Do you have more trouble than most people in changing your habits?			
	43	As a child, did you feel reluctant to leave home and go to school each day?	No	M	.26
	221	Do you think that the shortcomings in your present position in life are due mainly to your own mistakes?			
Ea	159	Can you deliberately lie to a friend and keep a straight face?	Yes	E	.46
	273	Are you annoyed by people who put on airs of superiority?	No	E	.40

TABLE 3 (continued)

Package symbol	No. in Ext. Ques.		Factor affiliation and loading		
	276	What do you do if a remark you make is passed by? a. Let it go. b. Repeat it till people catch on.	(b)	N	.28
Eb	102	Do you enjoy making life easy for waiters and waitresses?	No	E	.34
	125	Whom would you rather have at your supper parties? a. Good listeners. b. Good talkers.			
	216	Would you feel embarrassed joining a nudist colony?	No	F	.36
Ec	119	Would you like to be a missionary?			
	142	How commonly do you find that you set yourself a job to do and then have to give it up because you are tired? a. Everyday. b. Never.			
	157	Do you believe in censorship of movies and magazines?			
Fa	118	Do you crave travel?	Yes	F	.36
	172	How often do you feel a real urge to hear some music? a. Several times a day. b. Only rarely.			
	270	At a party are you disinclined personally to start cracking jokes and telling stories?	No	F	.35
Fb	84	What is your reaction to public pressure? a. It is wise to conform. b. You will do what you like anyway.			
	165	Do you like to impress people with your social status?			
	233	Which is more important to you? a. Religion. b. Politics.			
Fc	61	Are you ever so bored that you crave excitement?			
	153	Do you find it difficult to complain if your working conditions are poor?	No	F	.36
	203	Is there more than one correct way to worship?			
Ga	113	Does it worry you to be in the company of solemn, severe-looking, over-critical people?			
	154	Do you think every story ought to have a moral?	No)	.22
	266	If you find yourself with time between jobs, do you a. Fill it chatting with people or playing cards?			

TABLE 3 (continued)

Package symbol	No. in Ext. Ques.		Factor affiliation and loading		
Gb	91	b. Plan carefully to have some other work available at that time?	(b)	G	.33
		Do you think			
		a. Some jobs don't need to be done as carefully as others?			
Gc	300	b. Any job should be done thoroughly, if you do it at all?	(b)	G	.48
		Do you admire a clever but undependable man more than an average man with will power to resist temptation?	No	G	.36
	18	If you had more than enough income for your daily needs, do you think you should give most of the rest to your church or some good cause?	Yes	G	.32
Ha	85	Do you think people should observe the moral laws more strictly?	Yes	G	.40
	67	Are you slow at making friendships with people?	No	H	.32
	134	When too many tasks pile up on you, waiting to be done, do you have a hopeless feeling of being overwhelmed?			
Hb	176	When you walk down the street do you sometimes resent the way people look at you?	No	H	.46
	126	Which sort of spouse would you prefer?			
		a. One who will command admiration. b. One who likes to read religious books.			
Hc	235	Are you interested in the social problems of today?	Yes	H	.34
	283	Do you have fairly strong opinions on social questions when they come up for discussion?			
	146	When you make a just complaint, do you ordinarily expect to receive satisfaction?	Yes	H	.37
Ia	187	Are most of the people you know really glad to meet you at a party?	Yes	H	.32
	189	Do you have lots of energy for the work you do?			
	116	Which would you rather be?			
Ia		a. A bishop.			
		b. A colonel.	(a)	I	.68
	129	Do you think that much modern so-called "Progressive" education is less sound than the old common-sense idea of "spare the rod and spoil the child"?	Yes	O	.25
	283	Do you have fairly strong opinions on social questions when they come up for discussion?			

TABLE 3 (continued)

Package symbol	No. in Ext. Ques.		Factor affiliation and loading		
Ib	58	Which do you prefer to read? a. A really long novel, or other book. b. Short essays, short stories and reviews of news, etc.			
	183	Would you rather be a. An engineer? b. A teacher of social science?	(b)	I	.42
Ic	299	Are you an emotional person?			
	89	Which would you rather exercise by a. Fencing and dancing? b. Boxing and baseball?	(a)	I	.35
	248	Do you think that what people try to say in poetry could be put just as easily in plain English?	No	I	.38
La	282	Which would you rather spend an hour discussing? a. Recent essays on social progress. b. Ways of increasing one's income.			
	192	Would you like a job which required you to sit at a desk all day?			
	260	Do you think that witnesses generally tell the truth if it costs them a lot of embarrassment?	No	L	.37
Lb	261	When you are going to catch a train do you generally get hurried, tense, and anxious, though you know you have enough time?	Yes	Q ₄	.36
	210	Do you suspect that people who seem friendly to you are sometimes disloyal to you behind your back?	Yes	L	.31
	244	Do you smile to yourself at the big differences between what people do and what they say they do?	Yes	L	.30
Lc	255	Do people think that you are cynical?			
	147	Do you think foreign countries are actually more friendly to us than we suppose?	No	L	.35
	160	Which is usually stronger in you? a. Hunger for food. b. Hunger for amorous affection.			
Ma	246	If a neighbor keeps cheating you over small things, do you feel it is better to humor him than show him up?	No	L	.37
	130	How many of your neighbors do you find boring and tedious to talk to? a. A majority. b. Practically none.	(a)	M	.29
	161	Are you happy to be waited on by personal servants?	Yes	E	.47
	265	Are there occasions when you want simply to be by yourself, away from other people?	Yes	M	.33

TABLE 3 (continued)

Package symbol	No. in Ext. Ques.		Factor affiliation and loading		
Mb	96	Do you think that even the most powerful experiences during the year still leave your personality largely the same?	No	M	.29
	167	Are you inclined to be as considerate as possible of other people's feelings?			
	211	Do you tend to react more effectively when you are fresh than when you are somewhat tired?			
Mc	2	Do you ever have difficulty in keeping up with a conversation because the subject changes too fast?	Yes	M	.41
	141	Do you find it helpful to pace up and down when you think?			
	178	Which do you think people should do when they are in love? a. Marry regardless of differences of social class and background. b. Consider that such differences may ruin their companionship.			
Na	259	If there is a propagandist slant hidden in something you are reading are you apt to pass it over unless someone calls attention to it?	No	N	.34
	278	Which do you think the country would be better to spend more on? a. Armaments. b. Education.			
	287	Do you talk slowly?			
Oa	222	Do you find it easy to recognize familiar faces in a crowd?	No	N	.31
	264	Do you have almost uncontrollable fears or distastes for some things, e.g., an animal, a particular place, etc.?			
	272	Which do you do in relation to your week-to-week personal expenditures? a. Keep some sort of account. b. Never know what you have spent for sure.			
Ob	115	Do you find yourself with quite strong emotional moods, e.g., anxiety, laughter, misery, etc., which you cannot account for by anything that has recently happened?	Yes	Q ₄	.60
	145	If you are left in a house absolutely alone for some time do you tend to get anxious and fearful?			
	277	Do you have unexpected lapses of memory?			
Oc	62	Are you brought near to tears by discouraging circumstances?	Yes	I	.43
	164	Do you like to have responsibility?			
	207	Do you have good physical endurance?			

TABLE 3 (continued)

Package symbol	No. in Ext. Ques.		Factor affiliation and loading		
Q2a	262	If you could, which would you rather play? a. Chess b. Bowling.	(a)	Q ₁	.34
	267	Are you sometimes afraid of your own ideas because they are so unreal?	No	Q ₂	.21
	271	How have you learned more in school? a. By going to class. b. By reading a textbook.	(b)	Q ₁	.29
Q2b	72	When you promise to do something yourself, do you take pride in doing it alone and never getting outside help?	Yes	Q ₂	.22
	256	Could you stand living alone, far from anyone else like a hermit?	No	A	.48
	281	Do you care what other people think of you?			
Q2c	114	In a group would you rather be the man who a. Solves technical problems? b. Keeps the records and sees that rules are kept?	(a)	Q ₁	.20
	176	If you wanted to vote on some social issue would you read a. A recent novel concentrating on that issue? b. A textbook giving statistical facts, etc.?	(b)	Q ₂	.22
	197	Which would you rather have? a. More brains. b. Finer physique.			
Q3a	177	Do most people act as if they hate to see you coming?	No	Q ₃	.57
	236	Which do you believe in more strongly? a. Insurance. b. Personal luck.	(a)	Q ₃	.72
	279	When a problem proven to be too hard, do you try a. A different problem? b. Another approach to the same problem?	(b)	Q ₃	.60
Q3b	150	Do you think that there are more nice people than fools in the world?	Yes	Q ₂	.31
	238	Are you more energetic than most people at getting your work done?	Yes	Q ₃	.61
	269	Do you ever make a promise you know you won't be able to keep?			
Q3c	80	Do you wonder whether many people have a rather poor opinion of you?			

TABLE 3 (continued)

Package symbol	No. in Ext. Ques.		Factor affiliation and loading		
	94	Do you generally persist in your work even in the face of pleasant distractions?			
	231	When, in your opinion, someone shows bad manners do you			
		a. Say nothing, because you are probably being "fussy"?			
		b. Let them see clearly what you think?	(b)	O	.20
Q4a	121	Do you refuse to spend time thinking about "what might have been"?	Yes	N	.59
	239	Do you have quite fantastic, impossible dreams at night?	No	Q ₃	.48
Q4b	128	Can you depend on your memory not to let you down?	No	Q ₄	.58
	212	Does it require a particularly great amount of self-control for you <i>not</i> to do certain things?	Yes	L	.33
	268	Do you refuse to forgive people readily for insulting or unfair remarks?			
Q4c	195	Are your mood changes noticeable to others?			
	214	Do you sometimes get exasperated with small rules and regulations, which in calmer moments, you approve of?	Yes	N	.35
	215	When you talk, do you ever find that you have said something without consciously realizing it?			
<i>Items Modified from A and B Forms</i>					
		In a factory would you rather be in charge of?			
		a. Mechanical matters.			
		b. Talking to and hiring new people.	(b)	A	.57
		Would you rather be			
		a. In a business office, organizing people?			
		b. An architect, drawings plans of buildings?	(a)	A	.53
		Do you feel energetic when you most need to be?	Yes	C	.68
		Is your health uncertain, forcing you frequently to change your plans?	No	C	.60
		Are you slow in saying what you want to say, compared with other people?	No	A	.37
		Are you a sound sleeper?	Yes	C	.56
		Do you get impatient to the point of fury when someone delays you?	No	C	.32
		Have people called you a fraud, stuck-up, self-willed person?	Yes	E	.37
		Do you like large parties?	Yes	F	.50
		Do you feel awkward in company?	No	F	.47
		Have you ever been active organizing a club?	Yes	F	.43

TABLE 3 (continued)

Package symbol	No. in Ext. Ques.		Factor affiliation and loading	
		Would you rather see		
		a. A good historical movie?		
		b. An inspiring and clever view of future society?	(b)	M .34
		Would you rather spend an evening		
		a. At a hard game of cards?		
		b. Looking at photos of past vacations?	(b)	O .30
		Do you find that you need to avoid excitement because it wears you out?	Yes	O .62
		In your job does more trouble arise from men who		
		a. Are constantly meddling with what is O.K.?		
		b. Refuse to employ up-to-date methods?	(b)	Q ₁ .22
		Do you think it is cruel to vaccinate small children?	No	Q ₂ .44
		Would you rather read		
		a. A good historical novel?		
		b. An essay by a scientist on harnessing world resources?	(b)	Q ₁ .30
		Do you try to avoid getting involved in a lot of social affairs and responsibilities?	Yes	Q ₂ .23
		Are you a person who can banish worry easily?	No	Q ₄ .69
		Are there times when you feel too grouchy to see anyone?		
		a. Very rarely.		
		b. Quite often.	(b)	Q ₄ .62

clinical cases it may actually be reversed, as in malingering, but this affects so minute a fraction of *C* Form users that we are not concerned with it. (*b*) The necessary degree of dishonesty which permits (*a*) to operate. (*c*) Lack of self-insight, a factor for which has been demonstrated by Saunders (18) though it remains to be seen how different this is from general lack of psychological insight (14). (*d*) Sheer lack of coöperation, i.e., a careless indifference to how the responses are made.

Now of these, (*b*) could be estimated from Factor *G* and (*d*) from internal inconsistencies in the items contributing to any factor, while (*c*) might well prove to be related to some factor already in the scale, such as *C*— or *I*+. However, the perspective of practicability required by a short scale suggested that we confine ourselves essentially to sources (*a*) and (*b*). Actually, (*b*), in the present situation, can be considered operationally a part of (*a*), while (*c*) is taken for granted in the factorization, wherein we validate the response patterns as "behavior" against factors of rated criterion behavior (1, 3, 4) and make no assumptions of insight.

Accordingly a further study was started to find seven M.D. items (bringing the total questionnaire to 105 items), and then to determine which of the factor scores, if any, would need correction in a strongly motivated situation. Twenty questions were made up of a kind which would lend themselves to distortion in a job-seeking situation, in that they are hard to check and easy for the subject also to fool himself upon, e.g., by referring to comparisons within himself. Assorted examples from the 20 are:

"Does your memory work better now than ever it did?"	"yes"
"Do you make a success of most jobs you undertake?"	"yes"
"Can you get lazy people to work without incurring their displeasure?"	"yes"
"When people criticize your work do you get an impulse to criticize them back?"	"no"

The 20 were presented, sandwiched among the 98, to a group of candidates for entry to the Air Force and to a group of students near graduation, totalling 60 subjects in all. In each case they did the whole test in a motivation-free, "research" atmosphere with apparent anonymity of score sheets, and secondly in a situation in which they signed the sheets and were told this was a serious test governing their entry to the Air Force or their job recommendation records in the Dean's office. They were *not* told to "fake" or to "make their personalities attractive," for this would be an artificial and different situation from that of normal job application.

Seven questions were selected according to (*a*) having the greatest shift from the unmotivated to motivated situation; (*b*) having the highest mean correlation of shift with shift on all the factors, double weight being given to ranking on (*a*) in combining (*a*) and (*b*). Actually there was no significant *mean* shift on 12 of the factors, but individual difference in shift correlated significantly with M.D. shift in five.

The seven effective M.D. items, arranged for approximately equal "yes" and "no" answers, are as follows, in declining order of total effectiveness.

1. Does your mind fail to work as well at some times as at others?	No
2. Are you often bothered about what other people think of you?	No
3. Are you generally more considerate of other people than they are of you?	Yes
4. Do you try to deceive people by being friendly to them when you really dislike them?	No
5. Do you always find it easy to admit when you are wrong?	Yes

- | | |
|---|-----|
| 6. Have you, even for a moment, had hateful feelings toward your parents? | No |
| 7. When you know you are doing the right thing, do you always find it easy to do? | Yes |

Now the question of whether to correct for distortion on a factor according to (a) the regression of the total (final or motivated) M.D. score on the factor shift or (b) the regression of the *change* in M.D. score on the factor shift, is debatable. In any actual, practical, test situation all one has is the total M.D. scale score in the (more or less) motivated, "final" situation. One might get regression of final M.D. score on M.D. shift (which was substantial in this case) and regression of M.D. shift on factor shift. But, we decided to go directly from final, motivated score to "distortion" or change score on the factors, knowing that the seven items in the M.D. scale show substantial shift from indifferent to motivated situation, and that the final score must almost certainly correlate with a distortion shift on factors, if it exists. The exact correlations will need to be worked out in a variety of further groups and motivational situations, but in this experiment the correlations of total (motivational) M.D. scale with factor shift were as follows:

Factor A: $-.04$; Factor C: $.10$; Factor E: $.15$; Factor F: $.03$; Factor G: $-.01$; Factor H: $.27$; Factor I: $-.05$; Factor L: $-.15$; Factor M: $.02$; Factor N: $-.13$; Factor O: $-.06$; Factor Q₁: $-.14$; Factor Q₂: $-.28$; Factor Q₃: $-.05$; Factor Q₄: $-.10$.

With the standard error about $.13$ only two of the above need be considered in making corrections, namely H and Q₂(—). It is interesting that although the correlations are small they agree with psychological understanding of the factors. Thus H+, Uninhibitedness; Q₂(—), Social Conformity, and possibly E(—), Dominance are factors correlated with motivational distortion, while the "character" factors G, Super-Ego and Q₃, Will Control, are negligibly and negatively associated. Until more extended evidence is available it seems that no correction needs to be made on any factors but H and Q₂ and that these should be respectively lowered and raised by one quarter of the score on the M.D. scale—assuming the standard deviations on H, Q₂ and M.D. are approximately equal as in our data.

Although, in a questionnaire directed at maximum information from a hundred items, it may seem extravagant to give seven questions for correction on only two factors, we considered it desirable to incorporate the M.D. scale (cyclically distributed) in the final form. Further research may show some of the smaller correlations to be significant and there may be other

ways in which these unquestionably motivationally-distortion-sensitive items may be useful. The standardization and reliability data are set out elsewhere, since we are concerned here with validity and construction principles.

G. SUMMARY

1. A description has been given of the research and construction for developing a third (*C*) form of the Sixteen Personality Factor Questionnaire which shall be essentially 100 items and 20 minutes in length, in simple English and in situations readily translatable to other languages, and capable of yielding measures on the same 16 factors as in the *A* and *B* forms.

2. A new design, which may be called "package factoring," has been introduced in which (*a*) 450 carefully psychologically chosen Extension items were reduced to 300 by dropping eccentric cuts, etc., (*b*) the 300 remaining were reduced through a 30×300 matrix to 126 items shown to be well involved in the 16 PF factor space. (*c*) The residual 126 were factored with the original *A* and *B* form items in 75 packages (a 75×75 matrix) to provide an independent proof of factor structure and soundness of rotation, etc., of the original 15 factors. (*d*) The packages were undone and the items in the packages loaded in a given factor were correlated with an exact factor estimate (in a 15×40 , approximately, matrix). This design gives most of the results required from a complete 654×654 factorization and is thus a great saving.

3. Six items per factor could finally be obtained with loadings ranging from significance to high values. To these were added eight intelligence test items (for Factor *B*) and seven items to constitute a motivational distortion scale. The latter were specially designed items showing maximum change from unmotivated to motivated situations, and it was found that this scale needs to be used on two factors, *H* and $Q_2(-)$, and probably on *E* (Dominance).

The resulting 105-item test is in process of standardization and publication. The writers wish to express their indebtedness to Dr. G. M. Guthrie of Penn State University and Mr. Wylie of the University of Illinois.

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