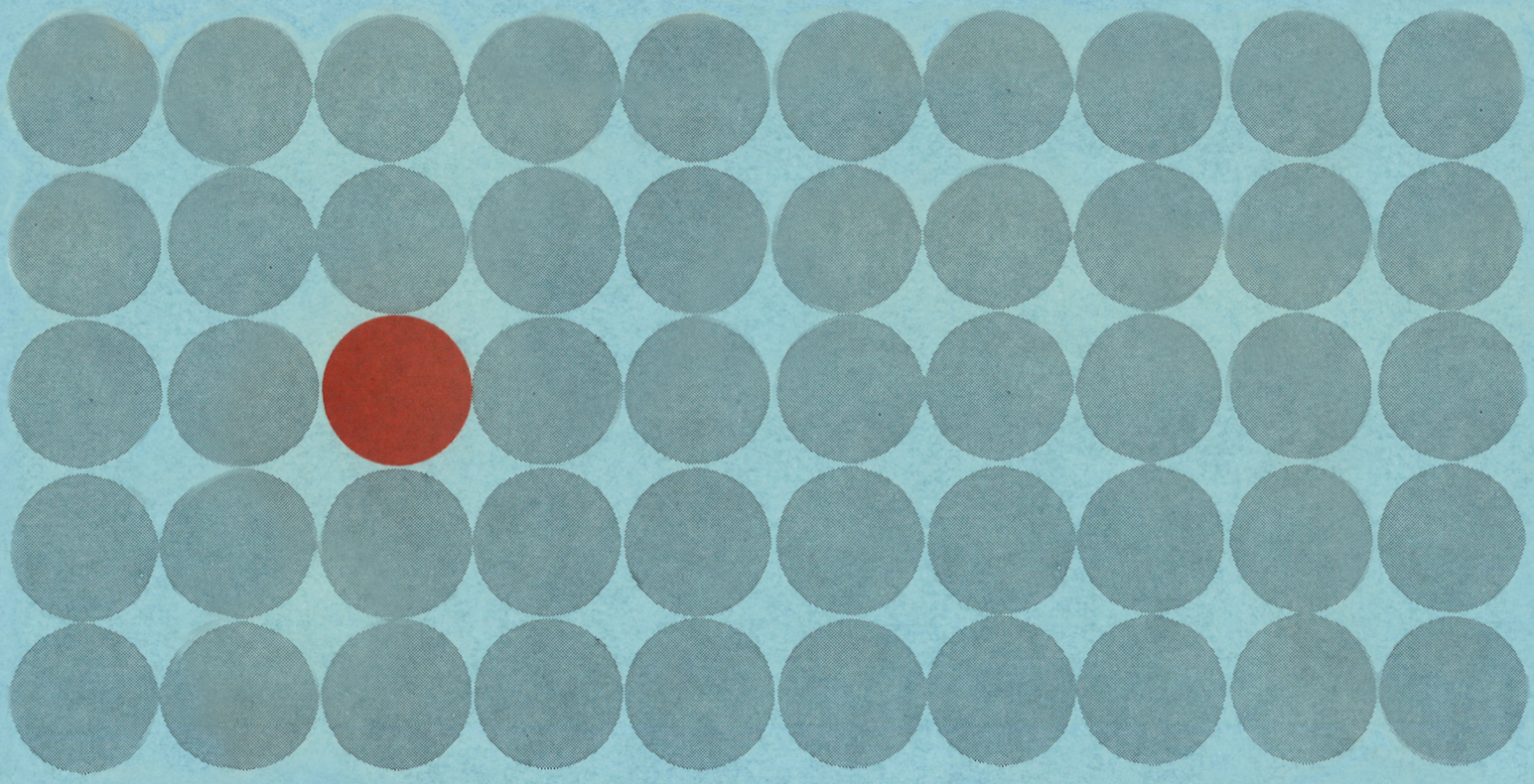

CHANGE IN THE STRUCTURE OF PERSONALITY RATINGS ACCORDING TO THE RELEVANCE OF OBJECTS

JORMA KUUSINEN

JYVÄSKYLÄN KASVATUSOPILLINEN KORKEAKOULU
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by

Jorma Kuusinen

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Center for Educational Research
University of Jyväskylä
Jyväskylä, Finland

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I INTRODUCTION AND THE PROBLEM

This report forms a part of the international comparative studies directed by professor C.E. Osgood, and coordinated by the Center For Comparative Psycholinguistics of the University of Illinois. [1] The main purpose of these studies has been to explain the affective meaning of words in different linguistic and cultural groups, and to investigate the structure of affective meaning and partly also the differences in the meaning of single concepts between the above-mentioned groups. International comparative studies have also been carried out on the affective meaning and differences of other objects than words; among other things colors, sounds and voices, facial expressions, etc., have been studied (e.g. Osgood, Suci and Tannenbaum, 1957).

Without tackling the theoretical background of the semantic differential technique or its applications, we can see that several studies carried out in different linguistic and cultural groups prove that the affective meaning of the elements of the three-dimensional world around us - whether they be words, colors, things or such like - can often be almost completely explained by three uncorrelated dimensions. These three dimensions, which in international comparative studies have appeared to be nearly the same, are Evaluation, which is characterized by the adjective scales good-bad, nice-not-nice, happy-unhappy; Potency, which is often defined by the scales strong-weak, large-small, heavy-light; and Activity, the characteristic scales of which are for example fast-slow, agile-clumsy, vivid-muted. The studies to date have proved that the content of the said basic dimensions seems to be independent of the linguistic and cultural

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background of the subjects; however, the objects of ratings may, under certain conditions, influence the nature of the factors as to their content (Osgood, Suci and Tannenbaum, 1957; Osgood, Archer and Miron, 1963; Miron and Osgood, 1964). This will be dealt with at some length in the following section.

The meaning of concepts that is usually measured by the semantic differential technique is called connotative or affective meaning. In addition, we can differentiate a denotative meaning for most concepts, a meaning which in some cases influences the change of content of the semantic differential factors. The observation of words like FATHER and MOTHER, and of scales good-bad and masculine-feminine provides us an illustrative example of this. The most common result is that with the concept FATHER the above scales correlate positively, while with the concept MOTHER a negative correlation between the scales is more common. This interaction between concepts and scales is called denotative confounding. (cf. Miron and Osgood, 1964).

The fact that in the ratings of certain concepts the different scales are in varying degrees relevant to the concepts has also caused changes in factor structures. Thus it was shown in one study how in the ratings of colors, Activity accounted for most of the variance of the objects, while in the ratings of words, Evaluation was the most dominant dimension, and in explaining the differences between geometric forms, Potency played an important role (Miron and Osgood, 1964). Also in some other applications of the semantic differential, the correlations of all the scales have been observed to increase with the scales that are connected with the dominant characteristics of the concepts to be rated.

In order to approach the subject under study more closely, we can observe that with certain objects it is not appropriate to be satisfied with the scales by means of which the semantic differential factors are usually defined, and it would not be appropriate to use the names Evaluation, Activity or Potency in describing the differences between objects. Such kind of objects are for instance 'personality concepts', which in the present study, also include the names of real persons and photographs of people. The factors of personality ratings vary in their number and content from one study to another, but we can conclude after all that man's perception of

personality or its descripitons is not explained by means of only three dimensions. This fact does not agree with a three-dimensional conception of semantic space, and we shall now examine this apparent conflict with Osgood's theory.

The actual starting point of this study is Ware's study (Miron and Osgood, 1964), in which eight factors in all were interpreted, when the objects of ratings were personality concepts (e.g. MY WIFE/ HUSBAND, MYSELF, MOST DOCTORS, etc.) rated by 40 relevant scales. The result of Varimax-rotation, and the English names of the scales and their Finnish equivalents can be seen in Appendix 1. This result is explained (Miron and Osgood, 1964) through reference to other corresponding studies, according to which in rating certain concepts belonging to a limited class, the scales may be detached from their common affective clusters, as mentioned above. Furthermore, it is supposed that if the scales employed by Ware were used to rate irrelevant concepts, e.g. colors, the scales would return to the ordinary main dimensions of affective meaning. The basis of this hypothesis is the conception that Evaluation, Potency and Activity include the building blocks of language metaphors; in other words metaphors abstract the affective content of their significates. When we carry out ratings of personality concepts using scales relevant to them, they are, according to Miron and Osgood (1964), in a lesser degree metaphoric or connotative compared to such ratings where the objects are irrelevant to the personality scales.

The purpose of this study is to investigate how the factor structure of personality rating scales is affected when the objects are relevant in different degrees. At the same time we may receive information on how the meaning structure of individual rating scales is affected when the objects change. In a later phase of the study we try to investigate how the individual factor structure of personality ratings is affected when the objects change, and to what extent the individual factor structure of personality ratings corresponds to the average structure of ratings, and moreover, whether there are such differences between the individual factor structures of personality ratings which could be predicted from different personal and social characteristics of individuals.

II PROCEDURE

1. The rating method

The rating scales applied in this study were Finnish translated equivalents of the 'personality differential' scales reported by Ware (Appendix 1) supplemented with nine scales aimed to measure the Evaluation, Potency and Activity factors (Appendix 2). Appendix 3 contains the instructions given to the subjects (cf. Osgood, Suci and Tannenbaum, 1957, p. 83) and Appendix 4 presents the actual rating sheet, according to which the subjects carried out their ratings of each concept continuously on all scales. In Appendix 4 one can see that the scales have been systematically randomized with regard to direction and order. In order to avoid the effect of response sets on the results the procedure was to let a half of the subjects perform the ratings in a reversed order, whenever possible, and to ask the other half of the subjects to move from the lower end of the page upward.

2. Subjects and the objects of rating

The subject group consisted of 10 male and 10 female college students, who were paid for their work. Ratings were obtained of concepts belonging to the following groups, each including 30 objects.

A. Fellow-students

30 fellow-students of the judges were selected as objects of rating. The names of the objects were ready written on the rating instrument so that for a half of the judges the order was reversed. Naturally it was impossible to avoid differences in how well the judges knew all of the object persons, but in all it is not unreasonable to assume that this group constitutes a relevant object of rating from the point of personality assessment. The persons performing the ratings were Teachers' Training College students from the same year. Their studies are so course-like that ordinarily students of the same year know each other rather well.

B. Well-known persons and personality concepts

The concepts belonging to this group are listed in Appendix 5. In order to make the group of well-known persons as relevant as possible as regards ratings, the procedure was to let 50 fellow-students of the judges estimate the fame of 80 well-known persons. On the basis of this, the 18 best-known persons were selected as objects of rating. - Because the affective meanings of certain personality concepts were points of interest in this study, a total of 12 of them were included in the objects. Group B was assumed to be altogether less relevant,

regarding the ratings, than group A.

C. Photographs

The ratings were taken for 30 photographs which showed a man's face. The pictures were projected on a large screen and half of the judges performed the ratings in reverse order. The pictures were obtained from a photographer's studio and the persons appearing in them were unknown to the judges. The objects included both young and old persons. Group C was assumed to be less relevant than either of the two groups above.

D. Handwriting

Slides were taken of 30 neutral content handwriting samples. Again half of the judges carried out their ratings in reverse order. The rating of handwriting was considered somewhat difficult and inappropriate, so group D was supposed to be rather irrelevant as to the application of the personality scales used.

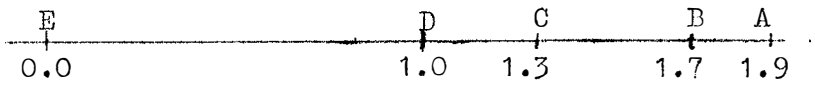
E. Irrelevant concepts

Appendix 6 will present the concepts belonging to group E. These were words describing different objects and properties. Although this group can be regarded as extremely irrelevant as regards rating personality characteristics, some of the employed scales are, however, rather relevant for certain concepts, because insufficient attention was paid in the planning stage to the fact that some of the applied personality rating scales may be relevant in two different ways. Thus the scale flexible-rigid, for example, may be considered relevant in ratings of person objects, but very often it is also relevant in ratings concerning objects in inanimate nature (METAL, STONE). For this reason group E does not constitute an entirely homogenous group of irrelevant concepts. However, taken all together it may be considered very irrelevant from the point of the scales employed.

The ratings for each object group were carried out at separate sessions requiring about one hour per session. Furthermore, the procedure was to rate a half of the photographs and handwriting on one day, and the other half on the next day. As regards results it might be of importance that the rating of irrelevant concepts was performed last, for the judges had gone through the scales 120 times by that time (4 x 30), thus having had the opportunity to learn the scales and the rating technique rather throughly. Although no objective criteria concerning the relevance of the concepts could be prensented at the planning stage, the relevance of the rating objects was thought to be reduced in the order of presentation given. The most homogenous objects of rating were photographs and handwriting, whereas in the other groups the homogeneity of the concepts, especially with regard to relevance, was smaller. For instance, group B included the kind of personality concept (MY MOTHER, MY REAL SELF) whose rating in respect of the scales, would intuitively seem more sensible than the rating of some celebrities.

3. An empirical definition of concept relevance

In order to be on firmer ground in conclusions made concerning the relevance of the ratings, the degree of relevance was also empirically defined. This was accomplished by letting a group (N=32) of psychology students get acquainted with the objects and scales and then carry out the ratings of the relevance of the objects with a technique of paired comparison conforming to the instructions which are presented in the Appendix 7. The distances in relevance of the different object groups turned out to be as follows:



scale values

The relevance of the object groups increases from left to right and the empirical result supports the assumed change in relevance of the object groups.

III RESULTS

1. Factor analyses

The ratings carried out with the technique of semantic differential result in a three-dimensional score matrix. The method of transforming this matrix into a form which alows the application of correlative techniques depends on the aims of the study. Because the purpose of the present study was to investigate the connections between the scales with varying objects of rating, the primary score matrix was transformed into a two-dimensional form by calculating for each object the mean of given ratings on each scale. This is perhaps the most common procedure for treating the ratings of the semantic differential. Scale inter-correlations were computed for the separate object groups over concept means using Pearson's product moment coefficient. The analyses were continued by factoring the correlation matrixes by the method of principal axes using unities as communalities.

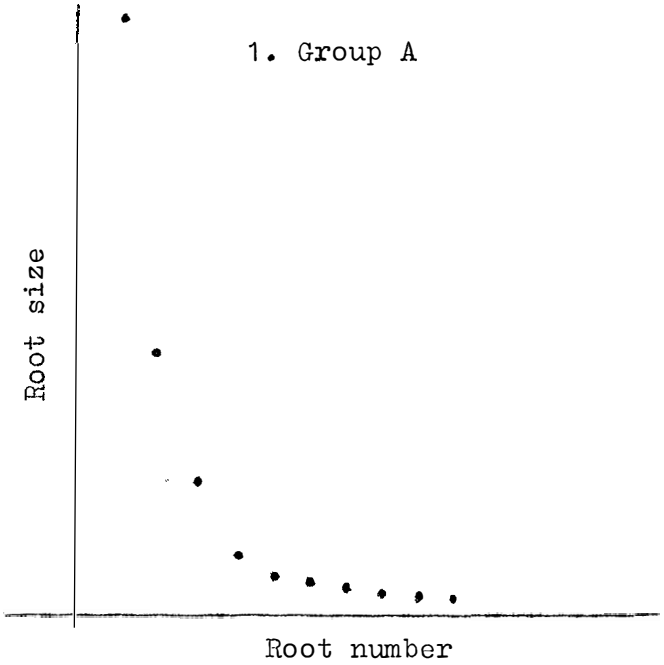
Before the analyses the direction and order of the scales were transformed into a form shown in Appendix 8, and in all tables this is the direction and order of the scales. The correlation matrixes appear in Appendixes 9-13. The factor roots are presented in Table 1, and graphically in Figures 1-5.

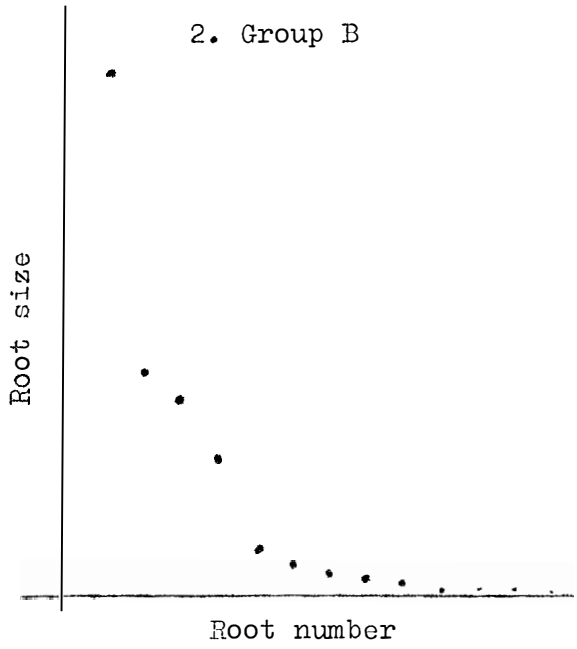
Table 1. Principal factor roots in the separate groups

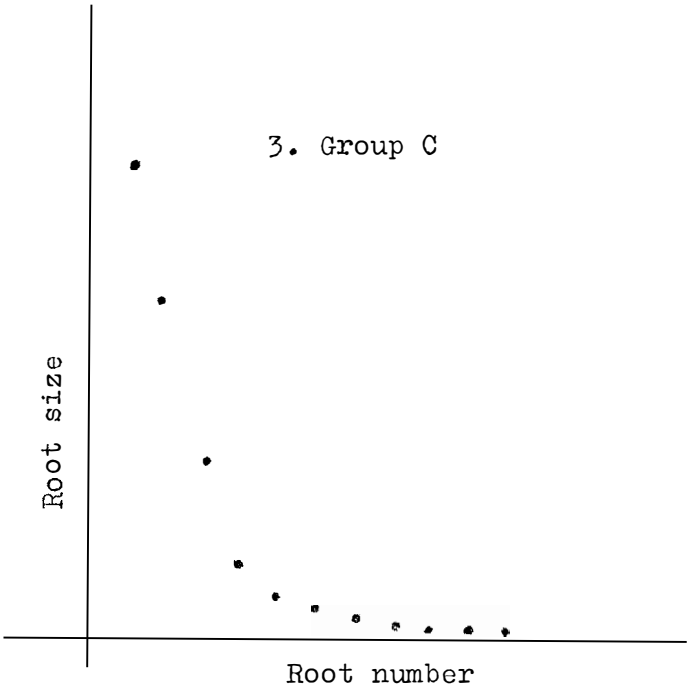
1.	15.3924	13.6933	12.3424	12.3145	13.2918
2.	6.5130	5.7041	8.6071	8.6681	7.9732
3.	3.2461	4.9590	5.5217	4.0129	3.6602
4.	1.4789	3.3459	1.7282	1.3451	1.9355
5.	1.1672	1.1241	1.0095	1.0359	1.6619
6.	1.0971	0.8976	0.8272	0.8624	0.7618
7.	0.7651	0.6644	0.4264	0.7295	0.6905
8.	0.5916	0.4713	0.3806	0.5548	0.4743
9.	0.4958	0.4286	0.3408	0.5164	0.3986
10.	0.4230	0.3021	0.3263	0.4582	0.3753
11.	0.3294	0.2702	0.2490	0.4209	0.2895
.	.	.	.	.	.
.	.	.	.	.	.
.	.	.	.	.	.
33.	-0.0334	-0.0129	-0.0287	-0.0121	-0.1154

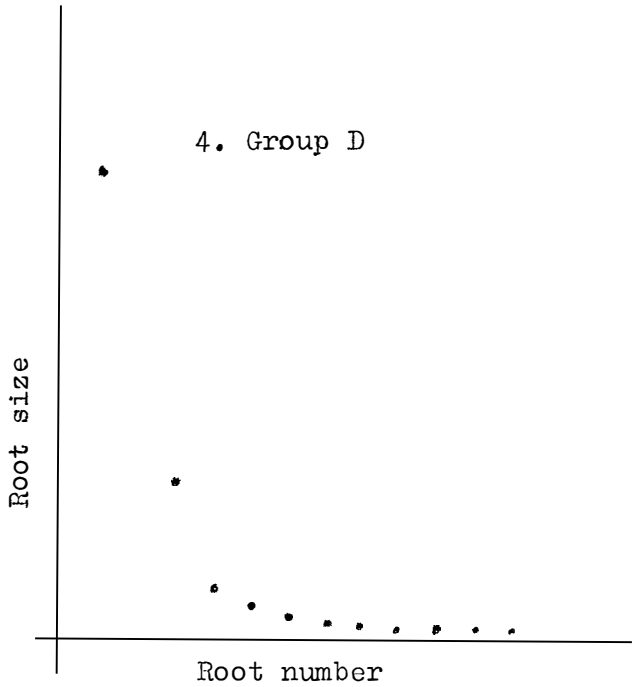
Total variance 33.0000 in each group

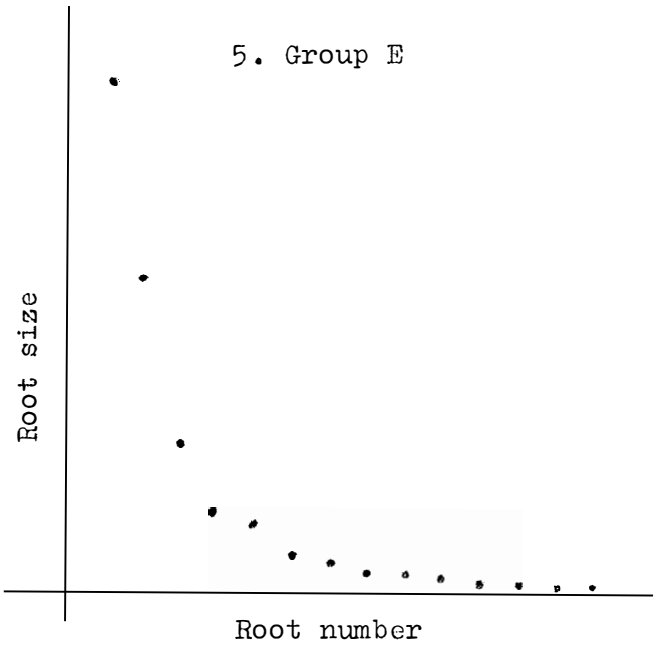
Figures 1-5: Plots of roots for the separate analyses











According to Table 1, the sign of the last root is negative in each group. In fact, the signs of the last four roots (30-33) are systematically negative in each group, owing to the fact that the number of scales (33) was greater than the number of observations.

On the basis of Table 1 and Figures 1-5 it is possible to gain a good idea of the number of dimensions required in each case to explain the correlations between the scales. It can be seen that in all cases the slope of the function is very steep, so that after the 4-5 first factors there is no substantial increase in the variance of factors. It may be noted that the share of the first five factors from the total variance is as follows: Group A: 84,2 %, Group B: 87,4 %, Group C: 88,5 %, Group D: 83,0 % and Group E: 86,4 %. These percentages are great enough to allow in all cases a sufficiently accurate description of the intercorrelations by means of five factors. However, while the interest in this study is in the structure of a certain field, the additional information possibly inherent even in small factors may be of importance. Thus the factorization was discontinued in each case not earlier than after ten factors were obtained. The factor matrixes can be seen in Appendixes 14-18.

In each analysis Varimax-rotations were performed with four, five, six and seven factors. While in some cases the seven factor solution could be meaningfully interpreted, this solution was chosen in all cases as the base for interpretation, thus giving also some presentational advantages. In no case has a interpretation based on seven factors significantly changed the information included in the rotations perfomed with fewer factors. Depending on the case the percentual share of seven factors from the total variance ranges from 87.8 % to 92.3 %, and the number of factors can be considered too great rather than too small. The results of Varimax-rotation with seven factors for each case are presented in Appendixes 19-23, where the communalities of the scales and the percentage made up by the separate factors of the total and common variance can also be seen.

2. On the nature of the factors

Because the ratings of various objects are given, there is reason to examine the nature of factors in different cases at some lenght. It would be most natural to define the factors according to whether the rated objects are regarded as really possessing the traits rated, or not. Thus the factors would represent in the former case the "real" dimen-

sions of the objects, in relation to the applied rating scales, as far as the judges have been able to observe and discriminate these properties. Factors from ratings of fellow-students, well-known persons, personality concepts and possibly also photographs might be considered to represent this type of factors. If the objects do not possess the traits referred to, or if only a few of the scales can be sensibly applied to rating of the objects, correlations between the scales and the results of factor analysis undoubtedly express the extent to which certain scales are similar in meaning, in which case one would not be able to speak about factors of object properties. It should, however, be noted that the objects must with regard to some scales be distinguishable, as a presupposition for the appearance of any kind of factors.

Factors of scales of a similar meaning may be assumed to be formed for example in a way that if the characteristics A, B and C of some real object always appear together (and in this sense are similar in meaning) the result is that if one can detect A in another object, characteristics B and C (in this case irrelevant) will also be perceived. This fact could be illustrated by supposing that a tall person is likely to be also energetic and healthy. When given for example the task of rating handwriting styles which can be differentiated of the basis of size, but which also have to be differentiated regarding health and energy, the usual strong connection between the three attributes quides one's judgements. In fact, this way explain the high correlations between the scales for handwriting and irrelevant concepts despite the fact that for many of the scales the rating does not make much sense.

The rating of handwriting styles can also be considered to take place so that with each separate task the judges are thinking of a person who might have produced the sample. Because the ratings are based on rather scanty information, the factors derived on this basis may be thought to represent some kind of personality stereotypes, which express the most common conceptions of trait combinations in a person. Similarly the factors of the ratings of the irrelevant concepts may represent the most usual conceptions of trait clusters; e.g. the problematic situation arising from the task of rating the 'personality' of STONE or METAL, which can be solved by applying the ratings to 'a person who is like a stone' or 'a person who is like a metal'.

Nearly endless speculations concerning the nature of factors and rating in different cases are possible, but these will be restricted, because the results do not allow a positive verification or disconfirmation of the different alternatives. There is also no reason for absolutely insisting that the factors either do represent the basic dimensions of the "real" properties of the objects, or that they do not. Rather, it would be more reasonable to expect the factors of Groups A, B and C to describe the object properties better than those of Groups D and E. Regarding the results one also has to keep in mind the fact that the factors do not represent the 'real' basic dimensions of personality assessment, because the scales were given to the judges and, accordingly, the results only apply to these scales. From the point of the possible applications of these factors it is to be regretted that no information concerning the frequency and diversity of use of the traits has been acquired. The purpose of the study was not, however, to search for combined variables for practical applications, but to carry out comparisons of factor structures within a group of scales. Owing to the ends of the study no references to other studies of personality ratings or to ratings of facial expressions, for example, have been considered necessary. These will made in another study, in which the same scales have been employed in rating solely persons as objects, and which is now under way.

3. Comparison and interpretation of the factors

In order to find the factors common to the separate analyses and to support the purely verbal comparison of common factors the Wrigley-Neuhaus coefficient of congruence (Harman, 1960, p. 257) has been computed between the rotated factors of the separate analyses. [1] These coefficients appear in Appendix 24. The procedure to be followed in factor interpretation is to present simultaneously all the common factors chosen on the ground of the coefficients of congruence, rather than taking each analysis separately. This will give a clearer conception of the possible differences between the separate analyses.

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[1] For technical reasons the factors have been denoted by a group sign indicator and an arabian number. Thus e.g. A1 signifies the first factor of fellow-student ratings, D5 the fifth factor of handwriting styles etc.

The unnecessary repetition unavoidably brought about by the consecutive examination of the separate analyses will thus also be avoided. After the presentation of the common factors the factors left outside the interpretation will be scrutinized separately in each analysis. In the common factor tables the factors are presented in the same direction in spite of the fact that they might appear reversed in the individual analyses. This has resulted in clearer presentation and easier inspection. Correspondingly, the coefficients of congruence have been reversed in accordance with the direction of factors. The interpretation of factors has been made of loadings with a numerical value .30 or more.

3.1. The first common factor: Evaluation/Rationality

Table 2 shows the factors corresponding to the first common factor in the separate analyses and the coefficients of congruence between them. When these coefficients are used as a basis for selecting the common factors between the analyses, the most rigorous criterion possible is the demand that the coefficients between the chosen factors be the highest ones of those factors. This is the case with the first common factor. The average coefficient of congruence between the factors is .86, so they are very similar as to the contents and the size of loadings. Excluding the ratings of handwriting, the first common factor in the separate analyses is a so-called general factor, which explains on the average a third of the common variance of each analysis.

On closer inspection of the first common factor it can be seen to be composed in all analyses of at least three components, the first of which could be called the component of rationality or comprehensibility (deliberate-casual, tangible-intangible, formed-amorphous, rational-irrational, logical-intuitive), the second the component of stability of behaviour (predictable-unpredictable, capricious-steady, excitable-calm, emotional-unemotional), and the third the component of morality (wholesome-unwholesome, good-bad, moral-immoral, reputable-disreputable). Of the other intrinsically consistent trait clusters, which are not, however, common to all of the analyses in relation to the first common factor, may be mentioned the component of mental and/or physical strength for well-known persons, photographs, handwriting and partly for irrelevant concepts. As has been seen, the first common factor is in the separate analyses composed of several different traits and trait clusters associated by the fact that the scale poles are clearly

Table 2. The first common factor: Evaluation/Rationality

	A1	B1	C1	D3	E2
21. Deliberate-casual	.91	.94	.92	.71	.66
24. Tangible-intangible	.91	.93	.87	.53	.97
22. Formed-amorphous	.84	.84	.93	.75	.84
6. Rational-irrational	.84	.93	.88	.74	.80
4. Logical-intuitive	.75	.84	.87	.87	.72
23. Predictable-unpredictable	.66	.45	.67	.34	.48
32. Capricious-steady	-.85	-.92	-.80	-.60	-.42
10. Excitable-calm	-.82	-.49	-.33	-.37	-.56
12. Emotional-unemotional	-.78	-.57	-.73	-.77	-.50
3. Wholesome-unwholesome	.82	.82	.50	.61	.79
27. Good-bad	.65	.35	.47	.46	.85
1. Moral-immoral	.43	.68	.39	.30	.90
2. Reputable-disreputable	.48	.71	.48		.89
5. Objective-subjective	.81	.60	.59		.40
28. Strong-weak	.37	.39	.78	.63	
30. Large-small		.61	.62	.44	.31
29. Energetic-unenergetic		.58	.92	.59	.43
19. Proud-humble	-.55	-.43			
20. Sophisticated-naive	-.34	-.77			
18. Rugged-delicate	-.46		-.31		-.32
16. Tough-tender	-.45				
17. Insensitive-sensitive			.30	.45	
13. Gregarious-self-contained	-.41	-.44			
14. Sociable-solitary	-.34				
15. Extroverted-introverted	-.32				
26. Happy-unhappy		.73			
25. Light-gloomy		.36			.46
9. Individualistic-regular		.35	.35		
8. Unusual-usual					-.42
31. Agile-clumsy				.32	
11. Tense-relaxed					.43
Per cent of total variance	30.3	34.2	28.4	19.0	26.4
" " " comm. "	33.7	37.1	30.8	21.6	29.1

Coefficients of congruence	B1	C1	D3	E2
A1	.87	.86	.83	.87
B1		.90	.85	.80
C1			.91	.85
D3				.85

distinguishable favorable vs. unfavorable property. Thus the name Evaluation would probably best describe the nature of the first common factor in all of the analyses.

An interesting fact, and perhaps a point typical of personality ratings, is the observation that the highest loadings on the general evaluative factor fall on the scales associated with rationality. This result is possibly an indication that especially in western culture mental properties and abilities connected with intelligence are rated high, while other characteristics are of less importance. Another explanation for the central position of the component of rationality on the evaluative factor would be that people generally attempt to explain surrounding phenomena, and possibly particularly features observed in other people's behavior, as either rational and understandable or as their opposities, in addition to the fact that evaluations in the direction good vs. bad occupy a central position in the judgements. At any rate it might be of interest to investigate whether people with different cultural background differ in personality ratings with regard to the features that receive a strong evaluative emphasis.

If we go on to examine the differences between the separate analyses bearing upon the first common factor, inspection may be based on some basic causes of these differences; causes that to some extent have the same effect in the other common factors. - The most common cause for the differences, also mentioned in several other studies, is the concept-scale-interaction. Thus for instance within the first common factor some differences may be accounted for by bearing in mind that the evaluative power of the scales changes with the objects rated ("Quod licet Jovi, non licet bovi"). As an example, the differences in the loadings of the scale exitable-calm in different groups can be explained by the fact that fellow-students (A1) are not allowed to be as excitable as, for example, well-known persons (B1) including as objects of rating several actors, artist and politicians, whose careers may be considered to require a certain degree of emotional attitude towards various topics. Correspondingly, the scale capricious-steady has a relatively small loading in the group of irrelevant concepts (E2), because the capriciousness-steadiness of inanimate nature is evaluatively less involved than the same as a human characteristic. This interpretation is probably valid in this case, although one has to keep in mind that inanimate nature also includes phenomena, the capriciousness or steadiness of which is evaluatively important, like

for instance volcanoes.

Arising from the concept-scale-interaction, another cause for the differences is the possibility of applying the same scales with different meanings depending on the objects. On the basis of Table 2 it can be noted that the scales strong-weak, large-small and energetic-unenergetic receive, with the exception of fellow-student ratings (A1) and irrelevant concept ratings (E2), rather high loadings in the rest of the groups. Especially when comparing fellow-student ratings and the ratings for well-known persons and personality concepts the result can be explained by the properties in question for fellow-student ratings referring to physical characteristics, which presumably in this case are evaluatively rather neutral, whereas these properties in well-known persons are more often considered traits of mental greatness and strength, thus possessing also a strong evaluative character. It is not, of course, maintained that the ratings on these scales positively referred either to physical or mental properties; rather it possibly has more often happened in the case of fellow-student ratings that the judgments are based on size and physical strength, whereas it has been more natural to carry out the ratings of well-known persons with regard to mental greatness. With irrelevant concepts it has been possible to use the scales strong-weak and large-small purely denotatively, so that the ratings in question do not in all cases express the affective meaning of the concepts with regard to these scales.

Table 2 still reveals that the scales expressing sociability: gregarious-self-contained, sociable-solitary and extroverted-introverted at A1 (fellow-students) receive loadings according to which sociability is evaluated as a socially negative characteristic. At the scale gregarious-self-contained this result is repeated in the ratings of well-known persons and personality concepts (B1). Also with the second common factor, which follows, we shall see that sociability is associated with several characteristics which are usually considered as socially undesirable. Although this may be a rather common result, the fact remains that the ability to be sociable may often be of great importance. Thus the possible differences in the evaluation of sociability in different cultural groups might reflect the demands or expectations that are laid down in those groups for an ideal personality, for example. When studying differences in the conception of man in different cultures, notions

like this no doubt would be points of interest. Regarding the present results one has, however, to keep in mind that they reflect features characteristic to these spesific personobjects, and the sociability of these persons may acquire non-acceptable forms resulting in the negatively evaluative character of the sociability ratings.

As a summary of the first common factor it can be stated that broadly it is the general evaluative factor commonly found in studies of all kind of ratings. The factor also allows an internally more spesific interpretation as a factor of Rationality, corresponding to the factors of Rationality and Tangibility derived by Ware (Appendix 1). That the traits of rationality turned out to be the central desirable personality traits is probably not surprising; yet the result is an interesting demonstration of the personality valuations prevailing in our culture.

3.2. The second common factor: Sociability

The coefficients of congruence of factors A2, B2, C2, D2 and E3 are the highest coefficients of these factors between the separate analyses, so it can be concluded that these factors appear rather analogous in all groups. The mean of the coefficients is .83, and the second common factor can be seen in Table 3.

Table 3. The second common factor: Sociability

	A2	B2	C2	D2	E3
13. Gregarious-self-contained	.63	.76	.92	.91	.89
14. Sociable-solitary	.76	.93	.95	.93	.89
15. Extroverted-introverted	.76	.93	.95	.95	.89
33. Flexible-rigid	.88	.54	.80	.80	.60
31. Agile-clumsy	.77	.35	.56	.42	.53
25. Light-gloomy	.83	.83	.88	.86	.63
26. Happy-unhappy	.56	.49	.81	.74	.62
11. Tense-relaxed	-.53	-.73	-.89	-.70	-.68
20. Sophisticated-naive			.53	.37	.48
9. Individualistic-regular			.62	.47	.48
12. Emotional-unemotional			.33	.41	.35
5. Objective-subjective			.33	.56	.36
28. Strong-weak	.42			.60	
29. Energetic-unenergetic				.58	.41
30. Large-small				.68	
4. Logical-intuitive	-.31		-.37		-.36
24. Tangible-intangible				.35	
21. Deliberate-casual					-.48
6. Rational-irrational					-.36
22. Formed-amorphous				.34	
23. Predictable-unpredictable					-.68
32. Capricious-steady					.67
10. Excitable-calm					.61
17. Insensitive-sensitive					-.34
Per cent of total variance	15.2	14.5	23.0	23.4	22.2
" " " comm. "	16.9	15.8	24.9	26.7	24.4

Coefficients of congruence	B2	C2	D2	E3
A2	.85	.88	.90	.80
B2		.88	.85	.66
C2			.89	.82
D2				.74

The essence of the second common factor consists of the three scales of sociability and extroversion (gregarious-self-contained, sociable-solitary, extroverted-introverted) that with the exception of fellow-student ratings make up the strongest component of the factor in all groups. Also common to the second factor in each group are the components of activity (scales 31,33), evaluation (25,26) and the scale tense-relaxed. Obviously the factor is the dimension of Sociability corresponding closely to that of Ware, and it seems to be a combination of the Evaluation and Activity factors, and as

regards handwriting, of the factor of Potency (scales 28,29,30) of the semantic differential. The concurrence of the three basic dimensions of the semantic differential at the factor of Sociability is pertinent in confirming the results of an earlier study, where American college students rated descriptions concerning ways of living. In this study the dimensions Evaluation, Activity and Potency joined in one dimensions named the factor of Succesfulness (Osgood, Ware and Morris, 1961).

Despite the high coefficients of congruence between the separate factors of the second common factor, it is interestingly different in the different groups. Table 3 shows that the factor of Sociability remains rather narrow in the ratings where the objects really possess the traits in question, and where they are at least in some degree known to the subjects (fellow-students, well-known persons). Where the traits have to be inferred on the basis of minor cues (e.g. photographs) or where the objects do not at all possess these traits (handwriting, irrelevant concepts) the factor includes several such traits which can be thought to be associated with sociability. If we conceive that the factors derived in this kind of research give us knowledge about the cognitive structure of persons by defining those dimensions according to which observations are made of other people and which Bruner and Tagiuri (1954) call "implicit theories of personality", then the result indicates the differences to be expected when these implicit theories of personality are studied on the one hand at the level of concrete personality observations, and on the other hand at the level of trait labels, for instance. The majority of studies thus far concerned with the cognitive structure of person perception have employed observations of a certain kind of "concept person" (e.g. Asch, 1945; Hays, 1958; Bruner, Shapiro and Tagiuri, 1958). One may, however, question whether perceptions of concept persons and those of real persons take place within a similar cognitive structure, or whether the existence of differences can be presupposed. For instance, in Table 3 it may be observed that a certain dimension of the cognitive structure of person perceptions, called Sociability, is different in different cases with regard to the comprehensiveness of the dimension. Correspondingly, Todd and Rappoport (1964) have recently shown that the number of cognitive structure dimensions in person perception is smaller when the objects of rating consist of concept persons as opposed to real persons. According to the hypothesis mentioned in the beginning (Miron and Osgood, 1964), the structure of personality

ratings is reduced to the ordinary three-dimensional semantic space if the relevance of the ratings is decreased. This was explained as deriving from the fact that the ratings grow metaphorical, and the factors Evaluation, Activity and Potency are thought to be the core of all language metaphors. With the factor of Sociability, this reduction of the structure manifests itself also in the growth of the factor's percentual share of variance with the reduction of relevance in the ratings (cf. Table 3). As regards the formation and interpretation of the factors, the question arises as to what extent each rating, at irrelevant concepts, for example, is really metaphorical, or can only a few ratings be interpreted as metaphorical (e.g. METAL------tense). If the latter alternative holds true, the formation of factors is to be considered as having its origin primarily in the subjects' implicit theories of personality; thus, for instance a person, while performing the ratings, in most cases would follow his own implicit theory of personality, which dictates the way the separate traits are combined. If the formation of factors in the case of irrelevant concepts is explained in this manner, it also becomes possible to comprehend that there exist in general a correlation between the scales, and that factors occur even in cases where one would expect people to give most concepts on most of the scales the value 4, to express the neutrality or irrelevance of the scale for the concept.

In addition to what has been presented above one can note that the component of potency (scales 28,29,30) appears very clear and coherent with the factor of Sociability of handwriting (D2). The result indicates that laymen consider the extent and strength of expressional movements to be associated with extraversion, at least when no other information is available.

All in all, the results concerning the structure of personality ratings handled thus far show that in person perception the general evaluative factor and the observations concerning rationality and sociability appear to be rather central features. This means that at least these features and characteristics appear and may even be stated first in most descriptions of other persons. Furthermore, some changes have been demonstrated in the contents of the factors from one concept group to another. These changes have been accounted for by different interactions between the scales and the objects. These matters will be considered again in connection with the subsequent factors.

3.3. The third common factor: Toughness

The third common factor is composed of factors A4, B3, C3, D1 and E1. The factors and the coefficients of congruence between them have been presented in Table 4. Compared to the two previous factors there is the exception in the third common factor that the coefficient of congruence between D1 and E1 is not the highest coefficient between these factors, for the congruence of D1 to E2 and of E1 to D4 are even higher. Although D1 and E1 are not corresponding factors on the basis of coefficients of congruence, they have been chosen because both of them are corresponding factors to all other factors appearing in Table 4; all other coefficients of congruence in the table consist of the highest coefficients of the factor pairs at issue.

The mean coefficient of congruence of the component factors of the third common factor is .75, indicating comparative homogeneousness of all groups. However, for irrelevant concepts the result essentially deviates from that of other groups. In all groups the central component of the third common factor consists of the scales of Ware's factor Toughness (16, 17, 18), containing in all groups the scales proud-humble, sophisticated-naive (with the exception of irrelevant concepts), and a rather strong evaluative component of the scales good-bad, moral-immoral and reputable-disreputable. In addition to the first one the third common factor is another factor possessing a distinctively evaluativ and in this case moralizing, component. Thus "Toughness"is a proper general label, although it is not completely justified by the result given by handwriting (D1) and irrelevant concepts (E1), as will be seen.

Regarding the ratings of fellow-students, well-known persons and personality concepts, and photographs, the third common factor clearly constitutes the factor of toughness vs. tenderness. In these groups the factor is not essentially different as to the contents; the only prominent difference, and an important one in principle, is revealed in that the factor explains more than one fourth of the common variance of photography ratings (27,6%), whereas in the group of well-known persons this share is 20.6% and in fellow-student ratings 17.4%. This result is to be interpretated analogously with the corresponding result for the second common factor; the amount of information received about the

Table 4. The third common factor: Toughness

	A4	B3	C3	D1	E1
16. Tough-tender	.73	.94	.96	.87	.94
17. Insensitive-sensitive	.85	.95	.88	.73	.79
18. Rugged-delicate	.59	.74	.88	.77	.76
19. Proud-humble	.66	.85	.90	.88	.88
20. Sophisticated-naive	.63	.39	.52	.42	
27. Good-bad	-.64	-.45	-.80	-.49	-.34
1. Moral-immoral	-.62	-.63	-.77	-.88	
2. Reputable-disreputable	-.61	-.63	-.73	-.91	
3. Wholesome-unwholesome			-.64	-.54	
12. Emotional-unemotional	-.38	-.67	-.38		-.43
10. Excitable-calm		.47	.78	.81	
11. Tense-relaxed	-.48			-.36	.50
32. Capricious-steady			.35	.64	
9. Individualistic-regular	.38			.64	
8. Unusual-usual			.40	.78	
7. Unique-typical			.35	.85	
23. Predictable-unpredictable			-.48	-.82	
4. Logical-intuitive		.49			.36
6. Rational-irrational			-.35	-.31	
24. Tangible-intangible			-.30	-.60	
22. Formed-amorphous				-.40	
21. Deliberate-casual				-.38	.30
26. Happy-unhappy		-.30	-.36	-.37	-.55
25. Light-gloomy			-.39		-.36
14. Sociable-solitary	.40				
13. Gregarious-self-contained	.39	.30			
5. Objective-subjective	-.34	-.55	-.64		-.66
33. Flexible-rigid		-.47	-.43		-.50
30. Large-small		-.34			
Per cent of total variance	15.6	19.0	25.5	29.6	16.2
" " " comm. "	17.4	20.6	27.6	33.7	17.9

Coefficients of congruence	B3	C4	D1	E1
A4	.83	.87	.84	.52
B3		.91	.72	.82
C3			.87	.71
D1				.45

objects apparently has an inverse effect on the share of the judges' implicit personality theories in the correlations between the relevant traits.

Although in factor interpretation no particular attention is generally paid to minor differences between groups, because these interpretations would in most cases be based on similar concept-scale-interactions, it is, however, fitting to mention a few results in detail. --- With the Toughness factor there seems to exist a slight difference of tone as to fellow-student ratings vs. well-known persons, the interpretation of which is based on the differences between the objects rated. Table 4 show a considerable loading for well-known persons on the scale logical-intuitive, whereas this scale does not appear with fellow-student ratings. Considering this and the fact that the group of well-known persons and personality concepts included several politicians, statesmen and artists, the factor B2 could more exactly be called that of "calculating toughness vs. instinctive tenderness". For fellow-student ratings the factor would perhaps more precisely mean "natural toughness vs. tenderness". The third common factor of photographs would probably be "stereotyped toughness", which contains features that usually go together in people's conceptions of a tough person, for instance.

The loadings of the scales emotional-unemotional and excitable-calm for the factor Toughness in the ratings of well-known persons and photographs show how the meaning of the traits and their interrelationships may vary depending on additional information concerning the objects of rating. The intercorrelations of these scales are positive in all cases, and the loadings, being similar in sign in the first common factor, imply a certain kind of similarity of the traits in that case. When these traits become associated with those of Toughness, the correlations turn negative, as can be seen in the third common factor. On the basis of the result on could state that if a person is known to be rational, he is also known to be calm and emotional (cf. the first common factor), but if he is known to be tough, then calmness and emotionality are not associated in a similar manner. It is tempting to interpret the result as the unemotionality of a tough person being different from that of a rational and ethically high-level person (the first common factor). Asch (1946) has in his studies also referred to change of meaning of personality traits depending on the connections with some other traits.

Earlier it was pointed out that for handwriting the third common factor could not be interpretated as Toughness. For handwriting this factor explains most of the common variance (33.7%). Starting with the fact

that the most obvious dimension in differentiating handwriting is good-bad, it is appropriate to interpret the factor in question as one of good vs. bad handwriting style. The point scales of the factor can easily be considered as the basis for differentiation in this dimension. Further, it is to be noted that while carrying out the ratings the subjects may change the meaning of the scales to be more appropriate for rating the objects in question. For instance the use of the scale reputable-disreputable may in fact be replaced by the scale good-bad; similarly, the scale moral-immoral may be changed into clean-untidy, and tangible-intangible into clear-confused[1]. Let us further note that only for handwriting the scale tangible-intangible has a high loading on this factor, thus confirming the suggested interpretation of the factor as a dimension of good vs. bad handwriting styles. It is also worth pointing out that the scales of Ware's factor of Uniqueness (7,8,9) form a clear and uniform component on this factor only for handwriting. Is it not in fact normal that deviating handwriting styles are mostly the ones considered bad.

If we go on to irrelevant concepts, in this group the third common factor is found to be an interesting exception in that it does not at all contain the same evaluative or moralistic component which has been so central in the third common factor of the other groups. The explanation is again that the point variables have a different evaluative tone, depending of the objects. The "toughness" of irrelevant concepts almost solely refers to the physical properties of the objects and is in this case evaluatively neutral. Correspondingly, the loading of the scale tense-relaxed is as regards sign the reverse of that of fellow-student and handwriting ratings. This indicates only how the tenseness or relaxation of impersonal objects of inanimate nature has a different affective meaning from that of human applications.

To give a summary of the third common factor, it can be identified clearly as an evaluative-moralistic factor, save for the group of irrelevant concepts. In this sense the factor is concurrent with the first common factor. When compared with each other they can be found to include in all groups several identical scales, whose connections in the vector space have been explained by rotating the

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1) This may at least hold true with the Finnish translations of the scales, but it may not be so clear with English scale names.

axis in one case through the scales of rationality and in the other through the scales of toughness. The naming of the third common factor as the ordinary Toughness-factor of personality ratings was considered justified in the groups of fellow-students, well-known persons and personality concepts, and photographs, although slight differences between the groups could be shown to exist. In these groups Ward's factors of Toughness, Urbanity and Morality are combined; further, a clear component of Uniqueness appears for handwriting. As will be seen, the latter state of affairs results in the impossibility of interpreting a separate fourth common factor in the group of handwriting. For handwriting and irrelevant concepts the interpretation of the third common factor differs from that of the other object groups; in the former case it was considered to be a general factor of good vs. bad handwriting style, in the latter, a factor describing the physical properties of the objects.

3.4. The fourth common factor: Uniqueness

While searching for the fourth factor common to the separate analyses it became apparent that from the analysis of handwriting styles (D) it was no longer possible to find a separate corresponding factor to the factors of the other analyses which would be as clear as those presented in earlier cases. D1, already chosen from the group of handwriting ratings to represent the third common factor, corresponds also to the fourth common to the other analyses on the basis of coefficients of congruence (Appendix 24). This result indicates that in the other analyses there has occured a differentiation into two separate factors of a factor which for handwriting appears as one dimension. The second best representative of the fourth common factor in the group of handwriting is D7, whose coefficients of congruence with the factors chosen from the other groups are the highest ones of D7. The fourth common factor which is now composed of factors A3, B4, C4, E5 and D7 can be seen in Table 5.

Table 5. The fourth common factor: Uniqueness

	A3	B4	C4	E5	D7
7. Unique-typical	-.89	-.90	-.86	-.90	-.30
8, Unusual-usual	-.89	-.93	-.81	-.77	-.50
9. Individualistic-regular	-.83	-.87	-.30	-.42	
23. Predictable-unpredictable	.63	.74			
11. Tense-relaxed	.54				
18. Rugged-delicate	-.49				
16. Tough-tender	-.45				
19. Proud-humble	-.39				
2. Reputable-disreputable	.51				
1. Moral-immoral	.47				
27. Good-bad	.31				
3. Wholesome-unwholesome	.36				
10. Excitable-calm	-.38	-.36		-.30	
12. Emotional-unemotional		-.34		-.50	
13. Gregarious-self-contained	-.32				
32. Capricious-steady	-.32				
29. Energetic-unenergetic		-.53			
30. Large-small		-.53			-.31
22. Formed-amorphous		-.34			
20. Sophisticated-naive				-.75	
31. Agile-clumsy				-.35	
Per cent of total variance	15.5	12.9	6.0	10.5	2.6
" " " comm. "	17.3	14.0	6.5	11.6	3.0

Coefficients of congruence	B4	C4	E5	D7
A3	.67	.80	.65	.35
B4		.79	.66	.45
C4			.68	.54
E5				.57

The interpretation of the fourth common factor is again somewhat different in the separate groups, although its core component in each case consists partly or wholly of the scales of Ware's factor of Uniqueness (7,8,9), on the basis of which a general label for the factor could well be Uniqueness, or simply "Dissimilarity".

Perhaps the most interesting one is the fourth factor of fellow-student ratings, since it is the only factor having loadings of several strongly evaluative scales (rugged-delicate, tough-tender, proud-humble, reputable-disreputable, moral-immoral, good-bad, wholesome-unwholesome), so that dissimilarity of character is clearly disapproved. One feels inclined to interpret the result as a reflection

of prevailing general attitudes towards individualistic people; firstly, attention is most often paid to negative dissimilarities, and secondly, deviations most often tend to be regarded rather as negative than as positive phenomenon. --- It is surprising in many cases even in Finland of the 1960's, how the teachers and parent-teacher associations are unanimous in their attitudes toward the appearance and clothing of young people, and how often the long hair of boys, for example, has deliberately been made a problem of education, instead of allowing deviations in the outlook of pupils. The condemnation attached to long hair has lately gone so far as to have received public acceptance of physical violence the purpose of which has been to make the youngster shorten his hair, without anyone taking legal action against the violator. --- All in all, the fourth common factor of fellow-student ratings reflects perhaps a very common and far-reaching phenomenon, whose sad and destructive consequences can easily be seen in the history of mankind, e.g. in the form of racial struggles and the persecution of witches.

Well-known persons are different and unique by nature, and in this group (B) the factor in fact largely differentiates the personality concepts from well-known persons (cf. Appendix 5). With photographs the factor (C4) consists solely of Ware's Uniqueness-scales, thus being a rather specific factor for rating the uniqueness vs. typicalness of faces. As regards irrelevant concepts, it has been possible on the basis of raw scores to observe that the factor of Uniqueness also differentiates the objects in the direction of conspicuous vs. inconspicuous. The concepts RED and BRIGHT, for example, have been rated as deviating from typical, although they in general would be quite ordinary. Furthermore, it should be noted that the rating of the uniqueness of objects can in principle be anchored in at least two ways; either the similarity or uniqueness of a certain concept is rated in relation to other concepts judged, or the rating is made in relation to other concepts belonging to the same concept population (RED is compared to other colors, etc.). Thus for irrelevant concepts two kinds of ratings of similarity are involved.

At this point the question of the bipolarity of ratings can be examined. This problem is associated with that of the change of meaning of the scales, because with irrelevant concepts, for instance, it is no doubt more natural to describe (with the Finnish scale names) the fourth

common factor through only one pole (typical, usual, naive and unemotional vs. unique, unusual, sophisticated and emotional). Quite certainly in this case the scale sophisticated-naive (hienostelevayksinkertainen in Finnish), for example, hardly differentiates the objects in the direction defined by the scale name. However, the scale may change in the ratings so that the bipolar dimension in question becomes sensible, and changes, say, into a scale complex-simple or conspicuous-inconspicuous (again this is more obvious with the Finnish scale names: an English equivalent of the word "yksinkertainen" may be "naive" or "simple" or "inconspicuous"). --- On the other hand the ratings may be carried out on unipolar dimension, defined only by one pole of the scale, for instance on a dimension defined by the word "naive" (or "simple","inconspicuous"). These matters could have been brought out in several connections earlier, pointing out that in some cases the use of bipolar adjective scales may generate problems, because it is not always possible to know excatly what the ratings actually mean. On the other hand there is reason to favor bipolar scales in ratings, because it may be that they make it feasible to unify the frame of reference for the persons who do the ratings. --- It may be mentioned that quite recently a study concerning these problems has been published, with a critical examination of the functional opposition of adjectives from the point of view of the postulated bipolarity of the semantic space. On the basis of the results it was considered more justified to apply unipolar scales in the ratings, because, according to this study, the semantic space was not regarded as a bipolar one by nature (Green and Goldfried, 1965).

To summarize, as regards the fourth common factor there is reason to state that only for fellow-student ratings does it constitute a psychologically interesting factor of personality ratings. In all other groups the factor may be interpreted primarily as a general or surface factor or interindividual dissimilarities between the objects in each group. In the case of irrelevant concepts there was a further observation of the effect of differences between the objects, together with two "anchoring" possibilities, one dealing with intraobject, the other with interobject differences.

3.5. The fifth common factor: Physical activity

The fifth common factor, to be seen in Table 6, does not appear at all for fellow-student ratings, which in this study are the most relevant objects of rating. In all other groups there appear a factor which fulfils the strictest possible condition laid down on the coefficients of congruence for the factor to be acknowledged a common factor: the coefficients of congruence between the chosen corresponding factors are the highest ones of those factors (Appendix 24)

In all groups the highest loading of the fifth common factor is on the scale agile-clumsy which ordinarily is a purely physical property. The other point variable of the factor is the scale flexible-rigid, which can refer to either physical or mental trait. When the factor structure of these scales is examined, the second common factor (Sociability) is observed to have explained most of the variance of the scale flexible-rigid in all groups. On the basis of this it is likely that the ratings of mental flexibility have already been explained by the second common factor. What is left over is physical flexibility, so the present fifth common factor can be called the factor of Physical activity.

Generally speaking the loadings on this factor are small, disregarding the scale agile-clumsy. Because the factor's share of the common variance in each group is rather small for this and subsequent factors, the interpretations will not be very detailed. In some cases it would seem that certain factor contents are in need of interpretation because of some odd looking results. These detailed interpretations have, in fact, been carried out starting with the raw scores of single concepts on single scales, but these will not be presented because they would be too detailed, complex and speculative, and in a sense worthless in as much as the factors are rather restricted and specific. The result has been that in many cases peculiar-looking factor contents have been explained through the different possibilities of scale usage. Another explanation for the seemingly odd results has its grounds in several characteristics of the rated objects or persons, which were not taken into account, but nevertheless extended their influence on the scale intercorrelations in specific cases. Examples of the first principle of explanation have been presented earlier (e.g. flexibility can be both physical and mental), and this principle has been brought forth also in other studies, i.e. when it has been possible to show that

Table 6. The fifth common factor: Physical activity

	B5	C7	D5	E6
31. Agile-clumsy	.89	.73	.74	.69
33. Flexible-rigid	.57		.34	.47
18. Rugged-delicate	-.35		-.39	-.38
9. Individualistic-regular		.45	.35	
23. Predictable-unpredictable		-.33		
32. Capricious-steady				.36
10. Exitable-calm	-.43			
5. Objective-subjective	.33			
Per cent of total variance	5.9	3.7	4.6	4.8
" " " comm. "	6.4	4.0	5.2	5.3

Coefficients of congruence	C7	D5	E6
B5	.54	.67	.53
C7		.66	.66
D5			.58

the general Evaluation factor can be divided into several components. These components consist of different "modes of qualification" which within Evaluation could be for instace "meak goodness", "dynamis goodness", "dependaple goodness", "hedonistic goodness", etc. (Osgood, Suci and Tannenbaum, 1957, p. 62). Of the influential non-rated characteristics of the objects the age for well-known persons and photographs may be mentioned. In addition it should be noted that response sets may also produce some minor peculiar-looking results.

As regards the fifth common factor it could still be said that it seems only natural that this kind of a physical activity factor should appear in personality ratings, especially when in rating elderly people this characteristic is mostly evaluatively neutral.

3.6. The sixth common factor: Physical potency

If one takes liberty of regarding as somewhat common factors those appearing rather consistent, as determined by the contents and the coefficients of congruence, in three out of five analyses, then factors A5, C5 and E4 will form a sixth common factor. This factor appears in Table 7. With fellow-students and photographs the factor is a narrow

Table 7. The sixth common factor: Physical potency

	A5	C5	E4
30. Large-small	-.89	-.71	-.74
28. Strong-weak	-.55		-.84
20. Sophisticated-naive	.31	.41	
11. Tense-relaxed	.33		
18. Rugged-delicate	-.32		
29. Energetic-unenergetic			-.71
9. Individualistic-regular			-.52
3. Wholesome-unwholesome			-.39
5. Objective-subjective			-.35
Per cent of total variance	5.4	3.4	8.2
" " " comm. "	6.0	3.7	9.1

Coefficients of congruence		C5	E4
	A5	.76	.55
	C5		.49

factor of physical strength and size. On the other hand, for irrelevant concepts, a characteristic of mental strength (energetic-unenergetic) also stands out prominently. The result can be interpreted to mean that in person-object ratings it is possible to differentiate between physical and mental strength, whereas with irrelevant concepts this kind of differentiation is difficult. This factor does not appear at all for well-known persons and personality concepts, because especially in this group the appended Potency scales are easily understood as characteristics solely associated with mental properties, thus strengthening the interpretation of the present factor as Physical potency.--- In connection with so called spesific factors we shall see that the results include also a factor of mental strenght, particularly in connection with person-object ratings.

4. The specific factors

In the preceding discussion the criterion for common factors has been their appearance in at least three analyses. These factors amounted altogether to six. To be sure, on the basis of the coefficients of congruence the expectation was seven, for the factors A6, B6 and C6 all have rather high correlations to each other. In this case,however,

factor C6 did not allow a similar interpretation to that for factor A6 and B6, so they are all to be treated as specific factors. In the following appear the as yet uninterpreted specific factors for the separate groups.

Factor VI for fellow-student ratings: Mental potency (A6)

29.	Energetic-unenergetic	.85
25.	Light-gloomy	.37
12.	Emotional-unemotional	-.36
26.	Happy-unhappy	.33
28.	Strong-weak	.33
	Per cent of total variance	5.2
	" " " comm. "	5.8

Factor VII for fellow-student ratings: halo-factor (A7)

20.	Sophisticated-naive	-.47
31.	Agile-clumsy	.43
26.	Happy-unhappy	-.32
	Per cent of total variance	2.7
	" " " comm. "	3.0

Factor VI for well-known persons and personality concepts:

Mental potency (B6)

29.	Energetic-unenergetic	.51
11.	Tense-relaxed	.51
	Per cent of total variance	2.5
	" " " comm. "	2.7

Factor VII for well-known persons and personality concepts:

halo-factor (B7)

27.	Good-bad	-.75
18.	Rugged-delicate	.38
	Per cent of total variance	3.0
	" " " comm. "	3.3

Factor VI for photography ratings: halo-factor (C6)

2.	Reputable-disreputable	.32
1.	Moral-immoral	.31
10.	Excitable-calm	.30
	Per cent of total variance	2.3
	" " " comm. "	2.5

Factor IV for handwriting ratings: halo-factor (D4)

5.	Objective-subjective	.61
27.	Good-bad	.52
6.	Rational-irrational	.41
29.	Energetic-unenergetic	.36
3.	Wholesome-unwholesome	.31
18.	Rugged-delicate	-.30
	Per cent of total variance	4.9
	" " " comm. "	5.5

Factor VI for handwriting ratings: Consciousness of overt behavior (D6)

20. Sophisticated-naive	-.73
21. Deliberate-casual	-.36
11. Tense-relaxed	-.31
Per cent of total variance	3.7
" " " comm. "	4.2

Factor VII for irrelevant concepts: halo-factor (E7)

32. Capricious-steady	.33
30. Large-small	.32
Per cent of total variance	2.5
" " " comm. "	2.7

It is true that there is a moderate coefficient of congruence between some of the spesific factors, but in most cases it has not been possible to speak of corresponding factors, since the interpretation is based on 'significant' loadings. Perhaps the most interesting supplement to the preceding description occurs with factors A6 and B6, both of which seem to be factors of Mental potency, as distinguished from the earlier factor of Physical potency (A5, C5). The coefficient of congruence between A6 and B6 is .47. Both of them have a moderate correlation with C6 (.57 and .47) whose point variables, however, do not justify the same interpretation. A final statement concerning C6 could be that it seems to be a residual factor deriving from the great common variance caused by the strong evaluative nature of the scales.

The interpretation of factor C6 seems to be the best one for factor D4 also. As to the contents, this factor does not have clearly distinguishable special characteristics that could be the basis for naming it; instead the scales of D4 have a general evaluative tone in common, in the direction desirable-undesirable. Factor B7 also lacks specific content; however, the high loading of the scale good-bad should be noted, for it means that in this object group ratings on this scale do not have a strong connection with the rest of such scales which also have the component of good-bad.

Among the remaining factors, D6 is the only one with such consistency as to the contents that its naming could be considered. The two point variables of D6 are the same as in Ware's factor Urbanity (Appendix 1). Labeling D6 "Urbanity" in accordance with Ware would perhaps be too general, for, to be accurate, the factor suggests a

person characterized by careful consideration with regard to manners, dressing and other demeanour in contrast to one whose behaviour does not emphasize these matters on a conscious level. It is to be noted that this factor appears in the ratings of handwriting style which possibly reflect some other expressive movements appropriate to the above personality description. A somewhat awkward name for D6 would be "Consciousness of overt behaviour".

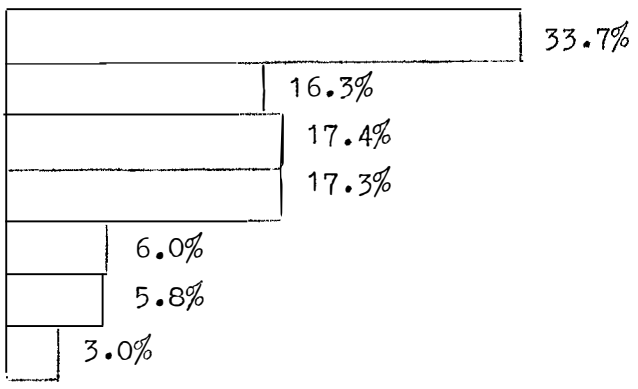
For factors E7 and A7 no actual interpretation can be suggested. To be sure, the latter resembles factor D6, because they have the point variable in common. However, in this case the coefficient of congruence between the factors is negative, although the loadings of the point variables are the same in sign, so there can be no talk of corresponding factors.

To summarize, as regards the specific factors one can establish that only factors A6 and B6 have more general significance is so far as they distinguish the factor of Mental potency as a component separate from the ordinary Potency factor, in addition to the factor of Physical potency presented earlier. In this respect the results are analogous with the results reporting the division of Evaluation into separate evaluative "modes of qualification" components. The rest of the specific factors examined here are in the first place the result of a strong evaluative halo-effect, which generally operates in this kind of ratings.

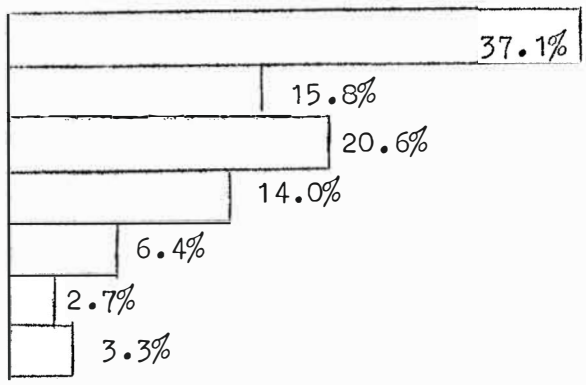
5. Summary of the separate analyses

Here we shall once more gather together the results of the separate analyses by presenting graphically each factor's percentual share of common variance in order to get a clear picture of differences in the differentiation of the factor structure of each group.

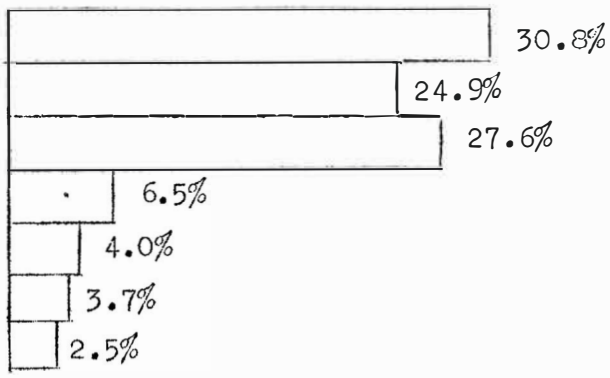
A. Fellow-student ratings



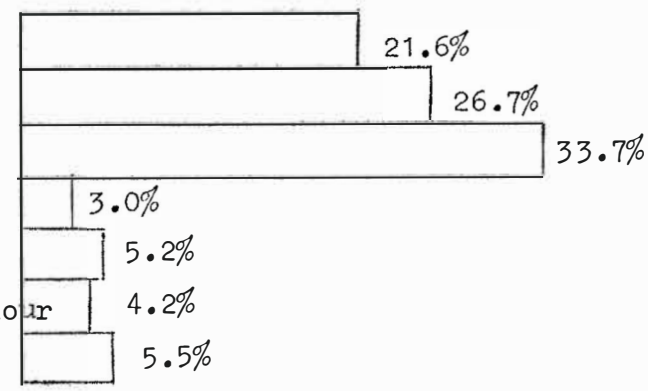
B. Well-known persons and personality concepts



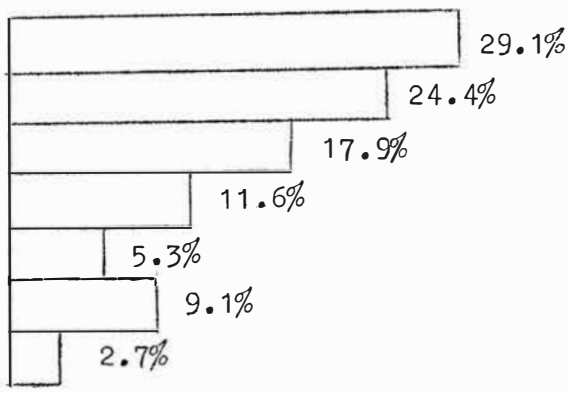
C. Photographs



D. Handwriting



E. Irrelevant concepts



Changes in the differentiation of the factor structures can clearly be seen in the figures. Differentiation is greatest in the groups consisting of ratings from real persons (A and B) and in the group of irrelevant concepts. The reason for the latter clearly is the evaluative neutrality of the objects of rating. Moreover, it should be kept in mind that irrelevant concepts were rated last. Thus the degree of learning may have had a differentiating effect on the structure. The main hypothesis of the study, namely, the constriction of the structure with a diminishing relevance of the objects, seems to be confirmed when one examines the structure of photograph and handwriting ratings, yet unambiguous interpretation of the three general factors appearing in these groups as factors Evaluation, Potency and Activity is not justified. Furthermore, it should be kept in mind that the interpretation which suggests that the ratings become metaphorical with decreasing relevance of their objects producing constriction in the factor structure has not been accepted in this case. Instead, the starting point in the interpretation has been the effect of the implicit personality theories of the judges (cf. p. 18).

The description of the factors obtained by means of the usual Evaluation, Activity and Potency dimensions is, however, considered appropriate, because the personality ratings studied here are thus placed in a more comprehensive frame of reference, created by studies dealing with the affective meaning of other phenomena. Then the dimensions Evaluation, Activity and Potency are all combined in the first common factor (A1, B1, C1, D3, E2); the dimensions Potency and Activity in the second (A2, B2, C2, D2, E3), thus creating the factor of Dynamism, which appears also in many other connections (e.g. Osgood, Suci and Tannenbaum, 1957, p. 180), and the dimensions Potency and Evaluation in the third (A4, B3, C3, D1, E1). The fourth and fifth common factors (A3, B4, C4, E5, D7 and B5, C7, D5, E6) are both Activity-factors, the former of which can be considered a factor of mental activity (Uniqueness), as distinguished from the latter factor of physical activity. The sixth common factor (A5, C5, E4), with factors A6 and B6, can be regarded as Potency-factors (Physical and Mental potency). Factor D6 can be interpreted as one of Activity, the rest of the specific factors being nearly factors of Evaluation. Particularly concerning the ratings of photographs and handwriting it is worth noting that their common variance is almost totally (over 80% in both cases) explained by the three factors that are different combinations of Evaluation, Activity and Potency dimensions.

6. The principal components

In the preceding discussion we have spoken about factors and factor analysis in spite of the fact that the method of principal components has been applied to define the dimensions. Thus it might have been more natural to use the term principal components, instead of factors. The adoption of the terminology of factor analysis is here justified by the general practice of calling dimensions 'factors', even if the factorization is performed by the method of principal components, choosing unities as communalities. Another remarkable fact is that when the communalities are high, as in this study, a factor analysis by the method of principal axes and the method of principal components both give the same result regarding the interpretation, if the rotation is similar in both cases.

However, closer examination of the principal components obtained may be interesting, because they show on the basis of a purely mathematical solution the directions where the greatest variance of the ratings is to be found. The most important characteristic of the method is that the variance of observations is greatest in the direction of the first principal component, the second principal component then takes its position orthogonally to the first one, in the direction where the variance of observations is next to greatest, and so forth. The principal components of each group can be seen in Appendixes 14-18.

The principal components are not further examined or interpretated in detail. We may, however, state that in groups A - D the first three correspond to one another very well, so that the first component represents Evaluation, the second component a combination of Activity and Potency, and the third possibly represents Potency or simply "Toughness". In group E the largest principal component can be regarded as a combination of Activity and Potency, while the second component in this case represents Evaluation, and the third Potency or "Toughness". In each case the first three principal components explain an average of 75% of the variance of the ratings, so with them it becomes possible for example to form for practical applications such combined variables as with the least effort give the most information about the differences between the objects of rating, if one is interested in the differences prevailing along the applied 33 scales.

IV SUMMARY AND DISCUSSION

1. The main hypothesis and the results

The purpose of this study was to investigate what kind of changes take place in the structure of ratings on personality scales, when the relevance of the objects to be rated varies. Relevance was defined by taking into consideration the extent to which it is possible to give real information concerning the objects of rating and their differences by using the given scales; in other words, to what extent the objects of rating can be considered to possess properties referred to by the scales (Appendix 7). According to the main hypothesis of the study, with diminishing relevance there should occur a change in the structure of the ratings from a comparatively differentiated factor structure towards a three-dimensional structure which constitutes the basic structure of the semantic differential and which often rather exhaustively explains the affective meaning of different phenomena. This hypothesis has been based on the assumption that personality ratings regarded as irrelevant are metaphorical by nature, and the basic structure of the semantic differential has been claimed to make up the descriptive system for the affective meaning of metaphors, because metaphors are considered to isolate from their significates precisely this affective content or meaning (Miron and Osgood, 1964).

The results are consistent with the main hypothesis in as far as in the case of fellow-student ratings and ratings of well-known persons and personality concepts the factor structure is more differentiated than in the photograph and handwriting groups. Yet it is to be noted that the differences in the differentiation of structure can be detected only as differences in the percentual share of factors from the common and total variance. With irrelevant concepts the structure of ratings does not conform to the hypothesized direction of change. When the totality of the separate structures is examined, it has been considered most natural to interpret the results to mean that the structures of ratings of fellow-students and well-known persons and personality concepts describe the structure of real observations regarding those objects; as regards photographs and handwriting the share of real observations in the ratings grow smaller, and the factor structures describe to an increasing degree the similarity of meaning of the scale labels, as used in the style of personality scales. With irrelevant concepts the factor structure is, however, to a great extent to be interpreted as indicative of 'real' observations, but in this group the use of the scales in the fashion of

personality scales is not involved; instead, there has been the possibility of using several scales otherwise, more especially in a denotative way. If we rely upon this, the differentiation of the rating structure in the group of irrelevant concepts can be explained. In order to test the main hypothesis of the study it would have been beneficial, no doubt, if the applied irrelevant concepts had been replaced by something else, for instance by colours, forms or sound signals.

Drawing conclusions on the basis of the results with regard to the main hypothesis is also hindered by the differences between the object groups, not only concerning the relevance of ratings, but also regarding their more specific characteristics.

The effect of these specific characteristics is most prominent in the group of irrelevant concepts, where 'denotative confounding' caused the greatest difficulty in testing the main hypothesis. However, in all groups the factor structures are so similar as to their content that there can be no talk of serious specific-characteristic-effects. Undoubtedly, from the point of view of investigating the main hypothesis it would have been advantageous to obtain ratings of object groups differing only with regard to relevance. This could be accomplished, for example, by giving suitable objects of rating to separate groups of judges, who would differ only as regards the information given about the objects.

The hypothesis concerning the change of the factor structure as a function of relevance included the more precise prediction that the structure of ratings which could be considered irrelevant would be identical with the three-dimensional factor structure of the semantic differential, and that this result would be the outcome of the metaphorical character of the ratings for irrelevant objects. The most distinct three-dimensional structure was obtained for photographs and handwriting. The factors, however, are not undisputable Evaluation, Potency and Activity factor, but different combinations of these. Some other studies have also shown that in tasks related to personality ratings the ordinary factor structure of the semantic differential does not take shape. This arises clearly from the fact that a part of the ordinary Evaluation, Potency and Activity scales is different in meaning when these scales are used in the same way as personality scales, than when it is a question of ratings with, say, a heterogenous

group of words (cf. Osgood, Suci and Tannenbaum, 1957, pp. 176-188; Osgood, Ware and Morris, 1961) Regarding the interpretation of the factors obtained in this study we refer to our earlier point that a change of the character of the factors by the object group takes place as a change of factors of 'real' observations into factors of scale similarity. This interpretation conflicts with the explanation of the character of the factors in the case of irrelevant ratings which was presented in connection with the main hypothesis. However, this is not to argue against Evaluation, Potency and Activity factors being generated from the metaphorical nature of ratings in some cases, and being as such explanatory of the affective meaning of metaphors.

2. Comparison to Ware's results

Another purpose of the study was to investigate the possibility of replicating in a different situation the factors of personality ratings reported by Ware (Appendix 1). The results indicate that the factors of Uniqueness, Sociability and Toughness appear rather distinctly in this study also, whereas Morality, Rationality, Excitability, Urbanity and Tangibility do not exist separately, or as factors that could be interpreted in an analogous fashion. The result can be interpreted to show, how psychological measuring instruments which are purified with certain kind of data, especially within the domain of attitudes, interests and personality, rarely function in the same way in a new situation (the problem of cross-validity). In Ware's study the group of subjects was, with regard to the cultural background and language, very much different from the present one, and the Personality Differential factors presented were obtained with materials including ratings of so-called personality concepts by means of a total of 40 personality rating scales. When examining the correspondence of the results it must also be kept in mind that the application of translated Finnish versions of Ware's scales is probably the most important factor of influence. However close the translations might be, nevertheless they do not necessarily have the exact meanings of the original scales, for it is not unreasonable to expect that the names of personality characteristics, like those of common nouns, for example, have slightly different affective meanings between different language and cultural groups. This fact has been referred to in connection with the results when examining the evaluative tone of the Sociability scales, for example.

The correspondence of the results with those of Ware is, however, only a part of a more important and far-reaching problem, which concerns the nature of the factors as basic dimensions of person perception; one could, for example, conclude that the differences obtained are reflections of real differences in people's ways of differentiating other persons' personality. When examining the factors obtained as basic dimensions it must be made clear, for example, whether they are of the type where perceptions of other persons' personality are made only with regard to trait clusters defined by these factors. Or, to put it in a milder form: if personality observations are also made regarding some other characteristics, are the obtained factors such as to constitute the principal frame of reference for person perception? Even if observations concerning abilities, interests, attitudes, outlook, profession, social status, etc., were left outside observations defined as personality observations, and even if part of the factors obtained rather commonly appears within the domain of personality research, to talk of basic dimensions of person perception with reference to the factors obtained would, nevertheless, be rather questionable. One can never tell what the other characteristics, besides those given, on which people focus their attention are; what in general the frequency of "application" of the different traits in the observations in question is; whether the traits are applicable to only a few objects, or to many, and finally, what the importance of the different traits in person perception is. Not until these questions are answered is one justified in starting to search for the basic dimensions of person perception, for it might turn out that this study, for example, has ignored some very essential variables of interpersonal perception.[1] --- In connection with this, one may note that a further possible reason for the differences of the results of this study and those of Ware, which cannot exactly be "translated" from one language to another, is naturally the centricity of the traits.

3. Interindividual differences in the structure of ratings

One important problem arising from the preceding discussion concerns the possible interindividual differences of the structure of personality ratings.[2] It is naturally useless to try to develop a general technique

1) A cross-cultural study seeking answers to these questions has now been started by the Center for Comparative Psycholinguistics (University of Illinois).

2) The structure of personality ratings, of course, means the totality of relations between the elements contained in it: in this case the elements are ratings on the given scales.

like the one used in this study, if there is reason to expect differences in its function with different individuals (cf. e.g. Kelly,1955). In the literature we have found references to a couple of studies which are directly connected with interindividual differences in the structure when ratings are performed by a semantic differential-like technique; in one of these a heterogenous group of words was rated with ordinary semantic differential-scales, in the other personality concepts were rated with personality scales. Both of these studies showed that in this kind of rating no interindividual structural differences appear (cf. Miron and Osgood, 1964). If the individual characteristics of the structure of personality ratings are on the contrary measured by using some other techniques (e.g. Todd and Rappoport, 1964) differences can be detected both between different persons and within a single individual and these vary with the objects of ratings. In what follows an attempt is made to examine the reasons for the absence of interindividual differences in the rating structure when ratings are carried out on bipolar adjective scales, as is done in the semantic differential, compared to the ratings which use unipolar scales, for example.

In this case it seems sensible to suppose that if the elements of the rating structure, i.e. the single rating scales, have a similar meaning for individuals, then the structure made up of them is also more similar between individuals than when the scales carry different meanings for different individuals. However, it has to be noted that similarity of structures is logically independent of any similarity of elements; only here does it seem reasonable to suppose that the similarity of elements would also result in a similarity of individual structures. For this reason we intend to present some speculations as to why the bipolar rating scale especially would be more similar in meaning with individuals that a unipolar scale, for example.

The meaning of a word may be thought of as composed of a certain set of elements of meaning, through which the meaning of the word is learned. Thus the meaning of the adjective A may be represented as

$$A = \left[a,b,c,d,e\right]$$

Usually A has at least one linguistic opposite, which could be represented as

$$-A = \left[f,g,h,i,j\right]$$

Because A and -A are linguistic opposites their meanings may be thought of as being composed of opposite elements, so that f=-a, g=-b, h=-c, i=-d, j=-e. Then

$$-A = \left[-a,-b,-c,-d,-e\right]$$

We cannot here begin pondering what the actual meaning of the word in general could be, neither what the elements defining the word meaning could be, or what the opposites of such elements would be, either. This kind of scrutinizing may, however, be permissible even without these definitions. The meaning of the adjectives A and -A can on the basis of the above presentation be briefly shown as

$$A = \left[e_1,e_2,e_3,\ldots e_n\right] = \left[e_i\right]$$

$$-A = \left[-e_1,-e_2,-e_3,\ldots -e_n\right] = \left[-e_i\right]$$

If A and -A constitute a bipolar rating scale (A,-A), its meaning can be represented as

$$(A,-A) = \left[e_i\right] \cup \left[-e_i\right]$$

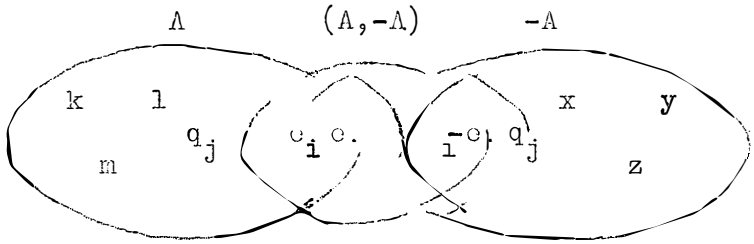
However, it has proved to be true in practice that it is often impossible to find linguistic opposites such as the ones above which would be complete opposites with regard to meaning, too. Instead it appears that several linguistically opposite adjectives contain common elements defining their meaning, plus elements which are not related to each other at all. These facts appear when an object might, in the opinion of the judges, be placed at either end of the bipolar scale, or when the dimension relevant for rating an object would be properly defined by only one end of a bipolar scale. The recent study of Green and Goldfried (1965) has also shown convincingly how the linguistic adjective opposites do not always function as functional opposites in ratings when they are used unipolarly. Instead, in some cases the opposing adjective scales have a positive correlation, and sometimes there is no correlation at all. On the basis of this the meaning of A and -A would be:

$A = \left[e_i,q_j,k,l,m\right]$ $\quad$ q_j = the common elements of A and -A

$-A = \left[-e_i,q_j,x,y,z\right]$ $\quad$ k,l,m and x,y,z = the unrelated specific elements of A and -A

When the ratings are to be carried out on bipolar adjective scales whose defining adjectives are not, in fact, opposites in meaning, there is a possibility of conflicts, either because the given scale is not unidimensional (due to the elements k,l,m and x,y,z), or because it is not bipolar (due to the elements q_j). One possible solution for a conflict of this kind is the definition of the meaning of the given bipolar scale only through the elements e_i and $-e_i$. This solution can also be considered very probable, because the very elements e_i and $-e_i$ define the opposition of the given adjectives and the meaning defined by them will presumably be that learned best. There is reason to suppose that in a conflict situation the meaning of a word is determined in accordance with the strongest elements defining it. This leads to the following meaning of a bipolar rating scale (A,-A):

$$(A,-A) = [e_i] \cup [-e_i]$$



In order to postulate the identity of meaning of bipolar adjective scales for different individuals, one has further to assume that the opposition of adjectives A and -A is learned by different individuals through the same elements e_i and $-e_i$. This assumption can be made, and in fact it only repeats what has been said about the nature of the elements e_i and $-e_i$: they are the strongest elements defining the meaning of A and -A as opposite adjectives.

However, the effects of concept-scale-interaction in empirical studies have shown that the meaning of an adjective scale in a rating situation is defined both by its "own" elements of meaning and by the elements of meaning of a given object; this state of affairs ought to have been taken into account in the discussion above. Moreover, the formation of meaning of bipolar adjective scales has been discussed as if the scales were dichotomous by nature. However, in most cases the rating scales contain several (e.g. seven) categories, and naturally this state of affairs ought to have been taken into account, and the question of how the meaning of adjective scales on different points of the dimension is formed discussed. We have not tried to develop our ideas to these directions, however, because at present there seems to be no firm basis for doing it. --- The thoughts presented about the meaning of adjectives as used unipolarly and bipolarly are, of course, very speculative and can be defended only by the fact that on a conceptual level

they offer one way of explaining certain empirical results. Thus one would be able to explain why unipolar scales differ in meaning for different individuals; this would be the result of the effect of specific elements k,l,m and x,y,z which may be different for different individuals. In a similar fashion it is possible to describe in this study, for example, the obvious unipolarity observed in certain factors; for some objects the given bipolar scales may have been used primarily in a unipolar way, because with some objects, for instance, the specific elements of adjective A become the strongest determinants of meaning of the bipolar scale (A,-A).

At present there is no reason to go any further into these very speculative matters. It would, in any case, be profitable to explore the meanings of unipolar and bipolar adjective scales and the possible interindividual differences in their meanings. It may turn out that there really are more interindividual differences in meaning of unipolar scales compared to bipolar scales; however, this need not necessarily mean that the interpretation presented above is correct, but it is one alternative.

4. Intercorrelations of factors

To make a further statement concerning the present study, we must say that the factor analytical treatment has not been carried out far enough, for all the effects of the relevance of the ratings to be made clear. In addition to differentiation and factor contents the correspondence of the factor structures could also be examined with regard to factor intercorrelations within groups. The rotations have been orthogonal, although quite clearly an oblique structure predominates within the subject field. One indication of this is the fact that in each analysis several factors of desirable vs. undesirable personality characteristics were obtained. In an investigation soon to be completed, where the individual properties of the structure of personality ratings constitute the central point of interest, attention will also be paid to factor intercorrelations.

5. Conclusion

In conclusion, one can say that the present study gives some answers to the problem of relevance of personality ratings, but its answers to the problems of personality ratings and their structure in general

are not too conclusive. In this respect the study does not differ from several others focused on the same problems, for in this field research does not seem to have progressed very far from the situation that prevailed a decade ago. It was then that Bruner and Tagiuri wrote: "It seems to us that there are at present at least two rather obvious gaps present in the impression-formation literature. The first concerns the manner in which naive subjects conceptualize and categorize other people. As we have said before and risk repeating now, there are now systematic studies devoted to an analysis of the categories used by ordinary people in everyday life for describing other people. What features of others are most likely to be noticed by people of various backgrounds in various kinds of situations? .....Moreover, what kinds of naive, implicit "theories" of personality do people work with when they form an impression of others?" (Bruner and Tagiuri, 1954).

The thoughts inherent in the above quotation still offer a concrete starting point for further studies within the domain of personality ratings and person perception.

R e f e r e n c e s

1. Asch, S.E. Forming impressions of personality. Journal of abnormal and social psychology, 1946, 41, 258-290.

2. Bruner, J.S. & Tagiuri, R. The perception of people. In G.Lindzay (Ed.), Hanbook of social psychology, Vol.II. Cambridge, Mass.: Addison-Wesley, 1954, 634-654.

3. Bruner, J.S., Shapiro, D. & Tagiuri, R. The meaning of traits in isolation and in combination. In R.Tagiuri & L.Petrullo (Eds.), Person perception and interpersonal behavior. Stanford, California: Stanford University Press, 1958, 277-288.

4. Green, R.T. & Goldfried, M.R. On the bipolarity of the semantic space. Psychological Monographs, 1965, 79, 6 (599).

5. Harman, H. Modern factor analysis. Chicago: The University of Chicago Press, 1960.

6. Hays, W.L. An approach to the study of trait implication and trait similarity. In R. Tagiuri & L.Petrullo (Eds.), Person perception and interpersonal behavior. Stanford California: Stanford University Press, 1958, 289-299.

7. Miron, M.S. & Osgood, C.E. The multivariate structure of qualification. Mimeographed manuscript, University of Illinois, 1964.

8. Osgood, C.E., Suci, G.J. & Tannenbaum, P. The measurement of meaning. Urbana, Illinois: University of Illinois Press, 1957.

9. Osgood, C.E., Ware, E.E. & Morris, C. Analysis of the connotative meanings of a variety of human values as expressed by American college students. Journal of abnormal and social psychology, 1961, 62, 62-73.

10. Osgood, C.E., Archer, W.K. & Miron, M.S. The cross-cultural generality of meaning systems. Mimeographed manuscript University of Illinois, 1963.

11. Todd, F.J. & Rappoport, L. A cognitive structure approach to person perception: a comparison of two models. Journal of abnormal and social psychology, 1964, 68, 469-478.

Appendix 1.

Varimax-rotation of Ware's eight factors of Personality Differential: the scales and their Finnish equivalents

Factor I (7,9 %) Morality

1.	moral - immoral/nuhteeton - paheellinen	.78
2.	reputable - disreputable/hyvämaineinen - huonomaineinen	.78
3.	wholesome - unwholesome/terve - epäterve	.73

Factor II (7,1 %) Rationality

4.	logical - intuitive/järkeilevä - vaistonvarainen	.66
5.	objective - subjective/tasapuolinen - yksipuolinen	.66
6.	rational - irrational/järkiperäinen - vaistonvarainen	.60

Factor III (6,7 %) Uniqueness

7.	unique - typical/ainutlaatuinen - tavanomainen	.77
8.	unusual - usual/epätavallinen - tavallinen	.74
9.	individualistic - regular/omintakeinen - kaavoihin sidottu	.70

Factor IV (6,6 %) Excitability

10.	excitable - calm/helposti kiihtyvä - rauhallinen	.81
11.	tense - relaxed/jännittynyt - rento	.77
12.	emotional - unemotional/tunneherkkä - asiallinen	.52

Factor V (6,5 %) Sociability

13.	gregarious - self-contained/seuraa etsivä-seuraa kaipaamaton	.76
14.	sociable - solitary/seurallinen - yksinäinen	.72
15.	extroverted - introverted/ulospäinkääntynyt -sisäänp.kääntynyt	.66

Factor VI (6,0 %) Toughness

16.	tough - tender/kovaluontoinen - lempeä	.78
17.	insensitive - sensitive/tunteeton - herkkä	.71
18.	rugged - delicate/karkea - hienotunteinen	.63

Factor VII (5,2 %) Urbanity

19.	proud - humble/ylpeä - nöyrä	.65
20.	sophisticated - naive/hienosteleva - yksinkertainen	.58
21.	deliberate - casual/harkitseva - ajattelematon	.53

Factor VIII (4,0 %) Tangibility

22.	formed - amorphous/jäsentynyt - jäsentymätön	.72
23.	predictable - unpredictable/ennustettavissa oleva-arvaamaton	.56
24.	tangible - intangible/selkeä - epämääräinen	.42

Appendix 2.

Scales of Evaluation, Potency and Activity

Evaluation

25. light-gloomy/valoisa-synkkä
26. happy-unhappy/onnellinen-onneton
27. good-bad/hyvä-paha

Potency

28. strong-weak/vahva-heikko
29. energetic-unenergetic/tarmokas-tarmoton
30. large-small/suuri-pieni

Activity

31. agile-clumsy/ketterä-kömpelö
32. capricious-steady/oikukas-vakaa
33. flexible-inflexible/joustava-jäykkä

I N S T R U C T I O N S

The purpose of this study is to measure what kind of images different things arouse in different people. The measurement is carried out by making you judge the objects against a series of adjective scales. On each page of this booklet you will find an object to be judged and beneath it a set of scales. The adjective scales are composed of opposing pairs of adjectives, the "distance" of which is divided into seven categories.

How the ratings are carried out:

Let us think that UNIVERSITY is to be rated against the scale

rich:____:____:____:____:____:____:____:poor

1. If you feel that UNIVERSITY is either v e r y rich or v e r y poor, place your check-mark (X) as follows:

rich: X :____:____:____:____:____:____:poor

or

rich:____:____:____:____:____:____: X :poor

2. If you feel that UNIVERSITY is either q u i t e rich or q u i t e poor, place your check-mark as follows:

rich:____: X :____:____:____:____:____:poor

or

rich:____:____:____:____:____: X :____:poor

3. If you feel that UNIVERSITY is either s l i g h t l y rich or s l i g h t l y poor, place your check-mark as follows:

rich:____:____: X :____:____:____:____:poor

or

rich:____:____:____:____: X :____:____:poor

4. If you feel that UNIVERSITY is as rich as it is poor, place your check-mark as follows:

rich:____:____:____: X :____:____:____:poor

Thus: the greatest amount of the property in question is indicated by the ends of the scales with a decrease in intensity of the property towards the middle of the scales.

DO NOT OMIT ANY OF THE SCALES, AND NEVER PUT MORE THAN ONE CHECK-MARK ON A SINGLE SCALE.

Do not spend too much time pondering your answer, instead answer according to immediate impressions OF YOU OWN.

YOUR NAME: _____

IMPORTANT: ALTHOUGH IT IS THE PURPOSE THAT YOU SHOULD ANSWER ACCORDING TO YOUR IMMEDIATE IMPRESSIONS, DO NOT GIVE YOUR ANSWERS BLINDLY WITHOUT CONSIDERING THE MEANING OF EACH SCALE AT ALL. IN OTHER WORDS, YOU SHOULD NOT MAKE YOUR MARKS MECHANICALLY, INSTEAD BE SURE THAT EACH MARK IS THE RESULT OF CONSIDERATION.

The Finnish rating sheet

ARVIOINNIN KOHDE: _____

NUHTEETON:	____	____	____	____	____	____	____	:PAHEELLINEN
JÄRKEILEVÄ:	____	____	____	____	____	____	____	:VAISTONVARAINEN
AINUTLAATUINEN:	____	____	____	____	____	____	____	:TAVANOMAINEN
HELPOSTI KIIHTYVÄ:	____	____	____	____	____	____	____	:RAUHALLINEN
SEURAA ETSIVÄ:	____	____	____	____	____	____	____	:SEURAA KAIPAAMATON
KOVALUONTOINEN:	____	____	____	____	____	____	____	:LEMPEÄ
YLPEÄ:	____	____	____	____	____	____	____	:NÖYRÄ
JÄSENTYNYT:	____	____	____	____	____	____	____	:JÄSENTYMÄTÖN
VALOISA:	____	____	____	____	____	____	____	:SYNKKÄ
VAHVA:	____	____	____	____	____	____	____	:HEIKKO
KETTERÄ:	____	____	____	____	____	____	____	:KÖMPELÖ
HUONOMAINEINEN:	____	____	____	____	____	____	____	:HYVÄMAINEINEN
YKSIPUOLINEN:	____	____	____	____	____	____	____	:TASAPUOLINEN
TAVALLINEN:	____	____	____	____	____	____	____	:EPÄTAVALLINEN
RENTO:	____	____	____	____	____	____	____	:JÄNNITTYNYT
YKSINÄINEN:	____	____	____	____	____	____	____	:SEURALLINEN
HERKKÄ:	____	____	____	____	____	____	____	:TUNTEETON
YKSINKERTAINEN:	____	____	____	____	____	____	____	:HIENOSTELEVA
ARVAAMATON:	____	____	____	____	____	____	____	:ENNUSTETTAVISSA OLEV
ONNETON:	____	____	____	____	____	____	____	:ONNELLINEN
TARMOTON:	____	____	____	____	____	____	____	:TARMOKAS
VAKAA:	____	____	____	____	____	____	____	:OIKUKAS
TERVE:	____	____	____	____	____	____	____	:EPÄTERVE
JÄRKIPERÄINEN:	____	____	____	____	____	____	____	:JÄRJENVASTAINEN
OMINTAKEINEN:	____	____	____	____	____	____	____	:KAAVOIHIN SIDOTTU
TUNNEHERKKÄ:	____	____	____	____	____	____	____	:ASIALLINEN
ULOSPÄINKÄÄNTYNYT:	____	____	____	____	____	____	____	:SISÄÄNP:KÄÄNTYNYT
KARKEA:	____	____	____	____	____	____	____	:HIENOTUNTEINEN
HARKITSEVA:	____	____	____	____	____	____	____	:AJATTELEMATON
SELKEÄ:	____	____	____	____	____	____	____	:EPÄMÄÄRÄINEN
HYVÄ:	____	____	____	____	____	____	____	:PAHA
SUURI:	____	____	____	____	____	____	____	:PIENI
JOUSTAVA:	____	____	____	____	____	____	____	:JÄYKKÄ

Direction and order of the scales in the rating sheet
(in English)

1. moral-immoral
2. logical-intuitive
3. unique-typical
4. excitable-calm
5. gregarious-self-contained
6. tough-tender
7. proud-humble
8. formed-amorphous
9. light-gloomy
10. strong-weak
11. agile-clumsy
12. disreputable-reputable
13. subjective-objective
14. usual-unusual
15. relaxed-tense
16. solitary-sociable
17. sensitive-insensitive
18. naive-sophisticated
19. unpredictable-predictable
20. unhappy-happy
21. unenergetic-energetic
22. steady-capricious
23. wholesome-unwholesome
24. rational-irrational
25. individualistic-regular
26. emotional-unemotional
27. extroverted-introverted
28. rugged-delicate
29. deliberate-casual
30. tangible-intangible
31. good-bad
32. large-small
33. flexible-rigid

Well-known persons and personality concepts
(Celebrity was empirically defined beforehand)

1. My ideal self
2. Urho Kekkonen
3. My real self
4. Pekka Tiilikainen
5. Man
6. Aleksis Kivi
7. Woman
8. Niilo Tarvajärvi
9. My spouse
10. Sibelius
11. My mother
12. Elizabeth Taylor
13. My father
14. Väinö Linna
15. The most popular student of my course
16. Lenita Airisto
17. The most unpopular student of my course
18. Veikko Hakulinen
19. Student
20. Johan Ludwig Runeberg
21. Ideal student
22. Johan Wilhelm Snellman
23. My best friend
24. Nikita Kruschev
25. Juhani Aho
26. Napoleon
27. Frans Emil Sillanpää
28. Marilyn Monroe
29. Armi Kuusela
30. "Kari", the cartoonist

The irrelevant concepts

1. red
2. chair
3. round
4. blue
5. table
6. angular
7. green
8. lamp
9. oval
10. yellow
11. box
12. staright
13. black
14. curved
15. white
16. pen
17. stone
18. brown
19. paper
20. tree
21. grey
22. book
23. metal
24. bright
25. map
26. water
27. obscure
28. door
29. earth
30. window

The method used for the empirical definition of the relevance of the concept groups.

A group of psychology students was made acquainted with the scales and objects and then given the following instructions:

"You should judge the below mentioned pairs of the object groups according to what extent it would be relevant to use the given personality scales for rating the objects belonging to these groups. The relevance means here approximately the same as the sensibility and appropriateness of rating: in other words, is it possible to give some "real" information about the objects to be rated and/or is it possible to differentiate the objects in the directions defined by the given scales. Put your check-mark on that object group in which the objects are more relevant from the point of view of rating by the given scales.

1. well-known persons and personality concepts ( )
   fellow-students ( )

2. fellow-students ( )
   photographs ( )

3. handwriting ( )
   fellow-students ( )

4. fellow-students ( )
   irrelevant concepts ( )

5. photographs ( )
   well-known persons and personality concepts ( )

6. well-known persons and personality concepts ( )
   handwriting ( )

7. irrelevant concepts ( )
   well-known persons and personality concepts ( )

8. handwriting ( )
   photographs ( )

9. photographs ( )
   irrelevant concepts ( )

10. irrelevant concepts ( )
    handwriting ( )

The direction and order of the scales as they appear in the tables.

1. moral-immoral
2. reputable-disreputable
3. wholesome-unwholesome
4. logical-intuitive
5. objective-subjective
6. rational-irrational
7. unique-typical
8. usual-unusual
9. individualistic-regular
10. excitable-calm
11. tense-relaxed
12. emotional-unemotional
13. gregarious-self-contained
14. sociable-solitary
15. extroverted-introverted
16. tough-tender
17. insensitive-sensitive
18. rugged-delicate
19. proud-humble
20. sophisticated-naive
21. deliberate-casual
22. formed-amorphous
23. predictable-unpredictable
24. tangible-intangible
25. light-gloomy
26. happy-unhappy
27. good-bad
28. strong-weak
29. energetic-unenergetic
30. large-small
31. agile-clumsy
32. capricious-steady
33. flexible-rigid

A. Fellow-students: Matrix of scale intercorrelations Appendix 9.

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
01																									
02	98																								
03	73	78																							
04	50	47	66																						
05	58	67	83	51																					
06	57	60	84	63	78																				
07	-69	-73	-57	-17	-48	-39																			
08	-67	-71	-58	-19	-45	-42	91																		
09	-67	-70	-45	-13	-34	-26	83	79																	
10	-68	-70	-81	-66	-73	-73	61	58	49																
11	76	72	29	24	14	15	-64	-60	-75	-43															
12	-24	-25	-64	-72	-47	-71	13	18	-08	58	10														
13	-72	-69	-50	-49	-35	-34	51	49	60	69	-78	82													
14	-68	-61	-40	-53	-23	-29	44	42	55	64	-77	20	94												
15	-58	-53	-30	-47	-16	-21	39	36	48	61	-73	17	89	95											
16	-86	-89	-72	-37	-68	-51	66	67	70	73	-64	08	65	61	51										
17	-44	-42	01	17	-14	14	28	28	46	09	-55	-58	34	37	31	62									
18	-87	-91	-72	-37	-66	-52	70	69	66	68	-75	15	69	59	51	20	48								
19	-84	-86	-79	-49	-72	-60	63	62	65	78	-52	24	66	63	49	93	49	79							
20	-63	-63	-63	-39	-46	-48	38	38	50	46	-32	17	44	45	32	65	36	47	78						
21	60	63	89	67	79	86	-49	-48	-37	-87	29	-68	-57	-49	-45	-61	08	-66	-67	-46					
22	27	35	66	57	70	64	-24	-16	01	-57	-16	-59	-15	-09	-08	-30	26	-31	-35	-20	68				
23	71	77	80	53	72	66	-77	-73	-67	-85	53	-47	-66	-55	-51	-72	14	-75	-75	-48	81	43			
24	56	62	86	64	92	85	-39	-35	-23	-78	09	-59	-38	-27	-20	-62	01	-60	-68	-48	85	80	67		
25	09	17	41	06	47	35	-09	-16	10	02	-40	-22	46	55	64	-13	17	-11	-10	-19	13	34	06	40	
26	26	37	39	-02	50	19	-23	-19	-20	-09	-07	-11	12	27	30	-30	-03	-32	-26	-22	15	31	23	34	62
27	89	91	80	55	82	68	-63	-56	-56	-75	53	-29	-62	-58	-49	-87	-43	-82	-89	-65	72	52	74	78	21
28	-12	-08	35	27	33	43	14	14	33	01	-54	-43	39	39	45	17	45	19	00	-26	23	49	-02	40	60
29	22	25	43	31	30	45	-07	-10	21	-06	-08	-47	17	23	33	-04	28	-21	-06	-11	27	34	13	34	58
30	-20	-19	04	09	07	18	12	20	25	-01	-40	-13	36	20	31	15	18	30	05	-14	-04	18	-01	23	22
31	-15	-08	18	-04	19	11	08	04	12	20	-38	-08	43	50	47	10	25	09	12	00	05	17	-09	17	65
32	-70	-75	-91	-67	-79	-84	54	56	43	92	-31	65	58	53	46	74	06	68	82	62	-89	-62	-84	-86	-19
33	-21	-10	05	-24	30	03	13	14	25	20	-48	22	52	63	62	00	-03	00	04	01	-04	21	-10	24	64

	26	27	28	29	30	31	32	33
27	33							
28	26	08						
29	37	16	53					
30	15	-06	56	19				
31	32	-05	35	29	13			
32	-21	-80	-21	-27	-14	07		
33	40	01	34	17	19	58	09	
	26	27	28	29	30	31	32	33

B. Well-known persons and personality concepts: Matrix of scale intercorrelations

Appendix 10.

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
01																									
02	95																								
03	71	77																							
04	28	29	57																						
05	73	79	80	26																					
06	62	67	85	80	68																				
07	03	09	-02	10	15	07																			
08	-10	-07	-18	-06	06	-08	88																		
09	21	34	31	15	55	36	77	74																	
10	-58	-56	-71	-19	-64	-53	38	44	00																
11	-09	-17	-50	-24	-49	-40	12	22	-23	58															
12	02	05	-35	-85	04	-56	16	28	21	20	23														
13	-54	-53	-23	-17	-19	-25	-28	-17	-23	11	-34	-03													
14	-04	-02	37	24	27	30	-35	-37	-12	-40	-69	-32	73												
15	-06	-03	34	19	24	23	-21	-23	-05	-32	-64	-26	69	93											
16	-72	-73	-47	27	-68	-20	21	25	-14	66	31	-44	25	-09	-06										
17	-47	-50	-11	59	-41	16	-03	-02	-22	24	-01	-78	34	24	23	81									
18	-56	-53	-40	27	-65	-20	26	15	-05	54	20	-34	-03	-23	-19	79	64								
19	-81	-81	-51	-06	-67	-37	00	15	-23	61	21	-28	47	06	09	86	73	59							
20	-73	-76	-61	-46	-56	-63	-22	05	-36	41	19	17	63	11	15	46	30	12	74						
21	60	66	75	80	61	90	31	14	49	-40	-26	-49	-35	14	12	-14	19	-05	-35	-68					
22	59	66	71	67	71	83	40	26	64	-39	-42	-30	-26	26	22	-27	-02	-18	-41	-64	86				
23	43	39	48	31	18	45	-57	-71	-43	-58	-20	-37	00	43	33	-33	02	-30	-38	-36	32	19			
24	68	75	80	70	75	90	32	16	59	-48	-36	-35	-38	16	15	-30	-01	-18	-50	-74	94	93	27		
25	33	38	60	25	60	47	-15	-24	17	-60	-78	-15	44	82	78	-42	-08	-43	-29	-17	36	52	35	46	
26	66	69	87	50	74	75	-03	-13	30	-74	-64	-30	-04	53	53	-50	-09	-43	-47	-49	69	73	48	76	81
27	58	60	43	13	64	39	11	00	24	-30	-20	11	-21	01	-01	-54	-42	-61	-50	-36	39	46	18	45	38
28	55	59	78	75	59	82	30	05	42	-42	-42	-48	-16	30	28	-12	19	-02	-33	-61	88	80	33	85	52
29	42	51	51	38	46	51	58	47	65	-10	-11	-01	-19	06	21	-10	-01	01	-22	-38	66	66	02	69	34
30	55	60	50	28	57	53	61	47	70	-22	-15	02	-51	-16	-11	-30	-30	-17	-57	-66	59	68	-05	70	14
31	-03	01	33	02	37	18	-19	-18	04	-46	-42	-19	44	44	40	-14	15	-34	04	24	12	01	08	11	48
32	-76	-77	-85	-64	-66	-87	-04	20	-25	63	33	42	38	-22	-13	41	08	28	62	79	-83	-76	-58	-84	-44
33	40	44	60	02	80	40	-08	-04	31	-69	-60	07	27	56	54	-62	-30	-73	-45	-15	34	43	20	44	75

	26	27	28	29	30	31	32	33
27	41							
28	74	36						
29	55	29	66					
30	44	30	58	55				
31	35	19	24	05	-08			
32	-74	-41	-83	-41	-61	-08		
33	68	48	36	26	25	68	-38	

C. Photographs: Matrix of scale intercorrelations

Appendix 11.

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
01																									
02	96																								
03	75	77																							
04	51	55	38																						
05	60	66	78	37																					
06	62	69	68	80	72																				
07	-35	-35	-36	18	-13	-01																			
08	-32	-37	-36	18	-31	00	76																		
09	04	07	33	12	56	29	34	-02																	
10	-62	-64	-71	-22	-82	-54	46	51	-37																
11	35	33	00	46	-15	24	-05	23	-58	09															
12	-12	-19	-02	-75	-05	-52	-25	-40	12	-14	-15														
13	-50	-42	-05	-59	03	-34	-02	-29	39	03	-84	48													
14	-37	-27	05	-43	19	-18	01	-30	49	-06	-83	32	94												
15	-26	-19	15	-45	21	-16	-01	-32	54	-12	-87	42	91	91											
16	-66	-64	-65	02	-66	-29	39	51	-29	82	14	-47	-02	-05	-19										
17	-55	-49	-51	24	-42	-03	42	56	-16	60	08	-68	-01	01	-11	89									
18	-74	-75	-67	-32	-77	-55	27	43	-37	81	-06	-21	16	07	-04	85	72								
19	-65	-62	-51	-01	-47	-23	54	47	01	75	-10	-32	23	23	06	86	76	73							
20	-65	-61	-32	-41	-18	-34	28	06	36	29	-62	29	70	68	56	33	27	39	62						
21	38	44	41	90	46	84	21	23	19	-24	36	-71	-45	-30	-32	06	30	-31	09	-22					
22	39	49	47	81	68	84	21	07	43	-42	10	-59	-18	01	-04	-16	15	-48	-03	-14	87				
23	65	70	66	62	64	75	-35	-33	16	-74	18	-29	-25	-11	-11	-47	-22	-60	-45	-34	56	64			
24	56	62	61	77	74	86	11	05	42	-51	12	-58	-29	-10	-11	-26	02	-50	-21	-29	82	89	59		
25	13	20	46	-21	56	13	-18	-51	61	-53	-74	42	71	80	84	-58	-42	-47	-28	32	-14	21	27	13	
26	25	32	62	-06	64	25	-22	-51	64	-54	-66	24	59	70	75	-51	-34	-47	-23	25	01	30	40	26	91
27	86	89	83	49	78	68	-27	-38	26	-73	20	-05	-28	-17	-06	-74	-59	-86	-66	-55	45	54	66	64	33
28	11	22	40	58	41	60	25	12	38	-07	-09	-55	11	26	17	16	37	-06	26	07	62	71	41	61	21
29	49	58	56	78	61	85	18	04	35	-31	18	-67	-24	-05	-09	-06	16	-35	06	-13	81	85	63	80	12
30	21	32	41	48	50	55	08	05	30	-23	-04	-51	05	12	18	-03	24	-16	-12	-25	50	58	35	65	19
31	-07	-09	13	-35	24	-18	15	-28	64	-06	-61	57	51	54	53	-26	-40	-23	09	47	-31	-09	-24	-13	56
32	-64	-69	-63	-80	-61	-82	15	09	-10	54	-40	63	45	29	29	28	01	48	36	58	-76	-77	-73	-84	-01
33	04	06	33	-29	57	08	-06	-36	63	-54	-70	50	66	69	74	-56	-45	-50	-29	32	-15	21	16	16	85

	26	27	28	29	30	31	32	33
27	45							
28	40	28						
29	31	53	69					
30	32	44	70	55				
31	52	03	-04	-08	-25			
32	-15	-71	-53	-71	-65	42		
33	71	27	08	01	09	55	06	

D. Handwriting: Matrix of scale intercorrelations Appendix 12.

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
01																									
02	93																								
03	65	62																							
04	50	42	59																						
05	32	36	65	24																					
06	45	43	81	66	60																				
07	-74	-79	-55	-37	-21	-41																			
08	-63	-67	-55	-33	-09	-39	86																		
09	-62	-57	-13	-15	12	-08	61	55																	
10	-82	-85	-71	-56	-40	-53	79	74	45																
11	44	39	04	26	-30	-02	-35	-27	-64	-32															
12	-07	01	-21	-60	11	-46	-05	-02	11	08	-32														
13	-30	-27	02	-21	31	-07	13	15	52	22	-70	50													
14	-05	00	35	17	51	25	-06	01	49	-15	-64	23	80												
15	-05	-02	30	-02	53	14	-06	03	48	-07	-61	41	87	84											
16	-69	-73	-39	-06	-37	-23	67	53	44	55	-14	-38	-09	-13	-17										
17	-45	-51	-28	22	-16	02	49	61	30	47	04	-53	-06	-03	-14	67									
18	-66	-73	-54	-16	-37	-38	57	56	25	62	-12	-20	17	-05	01	66	66								
19	-74	-76	-33	-13	-17	-22	72	72	65	65	-37	-22	31	29	20	80	68	64							
20	-38	-32	06	-31	21	-02	42	45	59	32	-32	07	36	32	43	32	22	12	55						
21	53	51	71	64	35	72	-48	-47	-19	-56	35	-51	-23	08	07	-19	-03	-36	-21	02					
22	49	52	81	75	44	72	-48	-47	-07	-58	08	-32	06	42	31	-29	-08	-31	-15	-03	71				
23	78	80	60	44	17	50	-76	-73	-66	-73	43	-10	-42	-08	-25	-59	-42	-66	-65	-43	51	52			
24	67	66	89	57	57	74	-57	-49	-11	-65	05	-17	11	40	35	-55	-32	-63	-34	06	70	79	58		
25	07	18	36	-02	61	30	-20	-10	32	-21	-59	27	72	79	78	-29	-14	-16	06	37	08	37	-07	40	
26	36	40	68	29	71	56	-31	-20	23	-48	-35	15	51	75	68	-44	-30	-48	-08	34	42	60	25	76	71
27	58	58	77	48	58	65	-49	-50	-13	-59	16	-15	-07	11	18	-36	-32	-60	-38	-06	72	61	46	75	27
28	-05	-02	43	48	38	48	-03	04	30	-07	-31	-17	42	63	55	22	35	09	41	28	32	62	02	41	43
29	05	08	62	41	65	63	-10	-04	33	-23	-36	-22	37	56	54	12	23	-06	25	33	43	56	-04	54	56
30	-06	-02	50	32	63	54	11	16	54	00	-58	-09	52	70	59	04	18	-10	36	36	22	52	-07	49	58
31	04	13	53	23	31	36	-12	-21	37	-22	-30	-07	26	54	31	-02	-10	-28	15	33	29	55	17	52	49
32	-72	-71	-76	-66	-30	-68	69	74	51	77	-34	38	33	05	14	42	26	46	56	45	-62	-68	-74	-67	-02
33	01	09	47	15	56	42	-09	-08	48	-21	-62	16	65	78	76	-13	-18	-27	12	44	27	41	-05	51	71

	26	27	28	29	30	31	32	33
27	48							
28	51	25						
29	60	52	75					
30	66	33	76	72				
31	52	36	45	54	54			
32	-24	-64	-12	-29	-11	-19		
33	79	33	57	67	68	62	-02	

E. Irrelevant concepts: Matrix of scale-intercorrelations Appendix 13.

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
01																									
02	93																								
03	76	77																							
04	65	66	51																						
05	39	44	55	-06																					
06	69	74	65	79	12																				
07	-09	-09	-15	-16	13	-36																			
08	-36	-37	-34	-55	06	-65	74																		
09	-20	-16	-11	-44	39	-52	49	67																	
10	-50	-60	-54	-55	-20	-78	47	61	51																
11	41	38	29	79	-34	72	-17	-42	-52	-55															
12	-40	-41	-41	-75	19	-74	48	75	72	55	-71														
13	-28	-31	-21	-57	37	-61	32	45	66	69	-79	65													
14	-24	-26	-14	-56	39	-57	28	39	60	62	-79	56	93												
15	-12	-16	-03	-53	45	-46	27	42	56	54	-80	60	88	84											
16	-12	-23	-16	33	-64	18	00	-15	-32	16	56	-43	-31	-33	-43										
17	09	04	05	55	-57	51	-24	-45	-56	-22	72	-76	-57	-54	-60	78									
18	-38	-41	-30	23	-57	04	-12	-17	-37	16	41	-49	-27	-30	-45	77	74								
19	07	-05	-04	35	-47	10	22	10	-08	19	52	-25	-21	-26	-24	83	62	51							
20	05	04	-04	-25	29	-31	69	69	58	44	-41	62	54	53	60	-28	-43	-46	06						
21	55	57	50	84	-09	86	-34	-59	-55	-71	82	-77	-71	-68	-58	30	56	20	35	-43					
22	77	72	68	66	23	68	10	-17	-12	-51	58	-41	-34	-32	-21	15	30	-16	44	10	69				
23	47	51	38	51	-08	68	-50	-59	-67	-84	64	-55	-78	-69	-59	00	30	-09	-02	-44	70	43			
24	80	81	70	70	33	80	-05	-39	-24	-56	49	-52	-26	-24	09	00	25	-26	22	06	71	87	48		
25	40	36	35	-18	59	-03	27	25	36	14	-48	38	55	58	72	-48	-53	-71	-16	65	-23	28	-18	42	
26	25	24	34	-34	69	-19	23	33	52	18	-59	46	62	66	70	-62	-68	-73	-37	60	-35	10	-32	20	84
27	85	85	79	49	64	63	-18	-40	-05	-52	19	-29	-10	-11	03	-38	-12	-52	-17	03	45	66	36	79	50
28	43	37	48	35	20	32	08	10	24	-15	43	-19	-16	-17	-16	23	21	13	37	01	31	56	03	31	-07
29	44	42	63	22	46	26	18	06	47	09	04	-05	25	27	26	06	-02	-14	24	23	15	46	-26	39	33
30	40	40	49	22	50	26	29	13	28	-25	25	-05	-08	-15	-13	-10	-03	-13	05	04	12	47	-06	33	05
31	15	08	07	-38	25	-36	43	46	44	46	-58	57	55	55	64	-31	-54	-61	-09	59	-48	-02	-39	02	73
32	-39	-44	-43	-58	01	-72	46	51	54	84	-70	63	79	72	63	-08	-42	-13	-08	49	-83	-49	-82	-44	36
33	-15	-14	-05	-62	35	-52	31	40	52	43	-82	71	70	71	73	-54	-70	-66	-47	57	-70	-33	-51	-22	62

	26	27	28	29	30	31	32	33
27	44							
28	02	31						
29	42	49	62					
30	17	45	67	49				
31	62	13	-23	25	-07			
32	34	-31	-35	05	-15	65		
33	71	02	-39	10	-13	81	70	

A. Fellow-students: Matrix of unrotated factors Appendix 14.

	I	II	III	IV	V	VI	VII	VIII	IX	X
1	90	-18	17	02	-17	23	-02	-01	04	-04
2	92	-09	24	05	-10	18	-05	03	04	-03
3	89	38	-04	07	-03	03	11	05	-05	03
4	63	22	-53	-07	-09	22	12	06	19	-06
5	79	45	12	-11	26	-01	-10	02	-04	00
6	75	46	-23	02	-04	-02	04	-19	-08	07
7	-73	17	-29	-37	08	36	07	07	-04	19
8	-71	16	-29	-43	10	30	-05	14	08	07
9	-67	42	-35	-20	09	31	-14	-15	-01	07
10	-89	-03	27	02	-17	19	08	03	02	-12
11	61	-67	12	18	-15	16	-04	-08	19	-03
12	-46	-49	62	-28	07	-04	-02	-10	08	-14
13	-75	52	25	02	-06	-10	-03	-10	-02	00
14	-68	59	34	13	06	-08	-07	-05	-07	04
15	-60	63	39	08	-07	-04	-07	-09	-14	06
16	-88	15	-32	18	-06	-05	01	04	02	-08
17	-29	53	-56	44	01	-11	08	17	-02	00
18	-87	15	-28	-09	-11	-21	10	11	-06	-04
19	-91	06	-17	26	05	03	-07	-02	13	-07
20	-65	-05	-16	40	40	03	-34	-14	19	01
21	85	27	-29	06	21	-04	08	-07	-04	05
22	51	58	-25	-05	29	-01	-18	07	05	-38
23	89	01	-03	17	06	-26	-05	-01	06	14
24	78	51	-10	-18	20	-02	-06	-06	06	-01
25	11	80	47	13	-08	10	09	-01	-08	01
26	26	46	53	09	-04	09	-32	55	04	10
27	92	05	15	-20	04	11	-04	00	02	-13
28	02	83	-13	-15	-33	-07	06	-02	-10	-28
29	20	61	02	31	-39	44	-18	-23	06	05
30	-09	48	-10	-40	-43	-45	-21	-05	37	11
31	-10	60	34	17	15	05	54	06	36	05
32	-91	-24	20	08	01	12	02	04	08	-16
33	-14	60	55	-20	37	-01	06	-15	06	02
variance	15.39	6.51	3.25	1.48	1.17	1.10	0.77	0.59	0.50	0.42
% total var.	46.6	19.7	9.8	4.5	3.5	3.3	2.3	1.8	1.5	1.3

B. Well-known persons and personality concepts: Matrix of unrotated factors. Appendix 15.

	I	II	III	IV	V	VI	VII	VIII	IX	X
1	-81	-23	32	-27	02	18	08	03	06	-09
2	-86	-25	30	-18	-01	14	07	-05	09	04
3	-92	13	-07	-09	08	-04	13	-01	11	00
4	-54	02	-75	-29	09	05	-16	03	09	00
5	-88	-02	24	24	17	-05	-08	06	08	12
6	-86	01	-36	-17	11	01	-06	13	08	11
7	-12	-72	-30	53	-06	01	00	-04	-19	-12
8	05	-67	-22	65	05	04	05	19	04	-13
9	-45	-53	-14	62	-03	-17	-03	02	07	18
10	71	-40	-28	17	-09	32	-17	02	-09	12
11	51	-53	07	-31	21	40	27	19	-06	08
12	24	-31	75	40	-19	11	09	-08	03	16
13	28	75	-13	46	-09	16	-04	06	-16	16
14	-33	83	-17	25	-26	08	-05	13	-05	06
15	-30	74	-19	36	-31	15	07	08	-02	-08
16	58	-04	-78	02	07	05	00	05	-07	-01
17	22	28	-89	-11	18	02	04	03	00	-02
18	47	-22	-71	-14	-24	-19	06	-30	01	07
19	68	21	-59	18	17	12	-02	01	18	-03
20	73	39	-02	35	23	17	10	07	13	-11
21	-83	-20	-44	-09	11	07	03	00	00	11
22	-86	-20	-30	14	-10	05	-18	10	09	02
23	-44	46	07	-60	-17	21	15	06	-18	02
24	-91	-22	-29	01	02	00	-01	02	06	09
25	-65	58	02	34	-19	08	-08	-13	03	-06
26	-90	27	-06	08	-08	02	12	-05	16	-19
27	-58	-10	33	09	32	38	-45	-22	-12	-11
28	-82	-04	-44	00	00	03	06	-17	-19	00
29	-59	-33	-29	35	-13	34	35	-22	06	01
30	-65	-55	-05	17	-11	-20	06	19	-25	-15
31	-25	55	02	35	59	-18	23	-16	-19	05
32	89	05	13	33	03	05	-01	-08	16	-03
33	-65	41	31	45	22	-07	05	11	-02	04
variance	13.39	5.70	4.96	3.35	1.12	0.90	0.66	0.47	0.43	0.30
% total var.	41.5	17.3	15.0	10.1	3.4	2.7	2.0	1.4	1.3	0.9

C. Photographs: Matrix of unrotated factors.

Appendix 16.

	I	II	III	IV	V	VI	VII	VIII	IX	X
1	82	08	-41	-07	13	23	-13	04	-03	16
2	87	06	-31	02	13	22	-13	-06	-04	16
3	84	-25	-07	10	13	22	-03	22	24	-06
4	68	59	28	-08	13	-03	02	-03	-18	-07
5	86	-33	12	-13	-06	-08	08	02	16	07
6	87	24	25	-04	08	-09	-06	05	14	00
7	-22	23	58	-64	-21	11	-18	-07	-07	-02
8	-30	55	38	-45	-34	-02	-29	15	10	02
9	35	-52	51	-43	-06	01	19	21	-18	-06
10	-78	37	26	-04	09	35	-06	-15	01	-01
11	16	82	-39	-04	09	00	-03	-23	05	-08
12	-31	-75	-47	-22	04	-03	-05	-02	13	-20
13	-29	-81	40	24	-05	-01	-04	-11	09	-03
14	-12	-79	51	22	02	00	-05	-13	00	08
15	-06	-84	40	18	-12	09	-09	-05	-02	08
16	-62	52	50	17	14	05	11	00	00	01
17	-36	54	67	25	-03	-09	01	03	-08	07
18	-80	30	32	27	00	09	-03	20	04	08
19	-55	25	68	-05	34	06	-01	-05	08	02
20	-48	-45	55	-08	31	-23	-04	05	14	-01
21	66	50	42	-09	12	-16	05	-05	11	-05
22	77	19	51	-10	02	-19	04	-19	-04	01
23	83	05	-03	23	17	-30	-21	12	-18	-14
24	84	21	35	-11	-11	-05	17	03	10	16
25	33	-88	21	10	-03	-01	-14	-06	-11	06
26	47	-76	27	16	09	13	-10	09	-11	-03
27	91	-10	-24	-08	-04	20	-01	-11	06	-09
28	48	11	72	18	03	20	-07	-03	04	-32
29	74	26	48	-04	25	07	-08	-01	00	14
30	55	11	47	32	-47	26	14	-01	01	-07
31	-07	-71	14	-47	31	25	22	-01	-07	-01
32	-86	-36	-09	-19	13	04	-10	02	01	01
33	27	-84	16	-14	-19	-23	-01	-15	06	05
variance	12.34	8.61	5.52	1.73	1.01	0.83	0.43	0.38	0.34	0.33
% total var.	37.4	26.1	16.7	5.2	3.1	2.5	1.3	1.2	1.0	1.0

D. Handwriting: Matrix of unrotated factors Appendix 17.

	I	II	III	IV	V	VI	VII	VIII	IX	X
1	-79	45	09	-01	-18	-13	15	-03	04	-11
2	-81	41	17	02	-10	-13	14	08	03	-16
3	-92	-14	-17	13	01	03	-06	04	-06	03
4	-62	04	-61	-28	-02	04	17	-26	08	-16
5	-62	-44	11	17	-48	17	-06	14	-03	-10
6	-77	-16	-40	07	-14	23	-04	09	09	23
7	75	-39	-20	26	-10	14	15	-12	01	-02
8	70	-42	-18	20	-36	-05	30	-02	01	-07
9	29	-80	-04	23	14	11	05	-28	10	-13
10	84	-29	-06	08	-02	08	04	-01	-17	31
11	-11	76	-32	08	-07	-44	00	-05	-13	-08
12	11	-13	89	-03	-02	-04	01	-02	-34	-12
13	-01	-78	45	-31	-02	-07	-09	-12	-02	12
14	-35	-80	22	-29	09	-07	16	-02	11	-06
15	-29	-78	36	-21	-11	-21	-15	-16	-03	01
16	61	-29	-59	04	19	03	-19	05	-07	-20
17	42	-28	-73	-17	-22	-12	10	16	04	-06
18	69	-23	-35	-41	-09	-13	-19	04	08	05
19	54	-64	-42	00	11	-14	07	03	-06	-01
20	15	-65	-02	52	02	-43	-05	18	03	08
21	-72	05	-45	17	01	-24	-20	-19	06	16
22	-81	-20	-33	-16	15	-10	09	-08	-07	07
23	-73	51	00	-04	15	00	24	18	-13	12
24	-91	-15	-06	14	01	-08	11	-11	-01	14
25	-42	-68	36	-13	-06	-07	-10	26	21	-04
26	-71	-55	21	10	-08	-13	17	-05	09	04
27	-79	-01	-12	29	-09	09	-29	-19	-20	-09
28	-36	-66	-38	-30	03	-10	09	07	-36	00
29	-50	-66	-32	00	-10	08	-26	15	-10	-15
30	-39	-79	-18	01	-09	24	22	01	-14	08
31	-45	-49	-08	21	59	05	10	17	02	-13
32	80	-36	26	13	-03	-20	11	-04	-03	-03
33	-46	-75	19	07	14	02	-05	-07	12	-01
variance	12.31	8.67	4.01	1.35	1.04	0.86	0.73	0.55	0.52	0.46
% total var.	37.3	26.3	12.2	4.1	3.1	2.6	2.2	1.7	1.6	1.4

E. Irrelevant concepts: Matrix of unrotated factors. Appendix 18.

	I	II	III	IV	V	VI	VII	VIII	IX	X
1	-49	-77	-05	-14	-07	-19	-05	10	-15	21
2	-50	-78	04	-06	-09	-16	04	18	-01	13
3	-42	-77	-03	04	21	-10	-12	-19	24	09
4	-82	-25	-20	-16	-01	-09	22	31	05	01
5	23	-78	15	31	23	10	23	-10	04	-01
6	-84	-40	03	-13	05	03	06	-01	09	-10
7	45	-13	-57	09	-47	-11	37	-06	16	-02
8	68	03	-44	26	-42	13	-03	-07	06	12
9	69	-27	-36	35	05	08	-12	27	02	-22
10	75	32	-44	-20	12	-10	-02	11	-05	13
11	-91	07	-28	05	-18	-01	01	06	-02	-04
12	87	-04	-01	21	-30	06	-17	07	-08	-11
13	85	-18	-13	-14	33	12	11	07	-12	-03
14	82	-21	-07	-19	35	15	07	03	04	09
15	78	-37	-03	-27	21	28	05	-07	-08	-05
16	-42	51	-61	-29	10	-07	-12	-11	-01	-05
17	-72	38	-35	-26	14	-03	06	-13	05	02
18	-37	72	-39	-03	33	04	19	-07	05	13
19	-33	21	-79	-30	-13	12	-18	-07	-10	-09
20	60	-39	-35	-14	-40	18	14	11	13	14
21	-91	-19	-04	-11	-04	17	-01	10	11	-14
22	-57	-62	-37	-08	-20	13	-04	-09	-08	-07
23	-77	-13	44	-04	-30	12	-17	-05	-02	05
24	-54	-71	-12	-32	-05	17	16	-06	-10	-15
25	45	-75	02	-36	-09	12	-01	-11	-10	06
26	56	-72	08	-04	07	12	-07	-09	08	10
27	-34	-87	13	-03	12	-12	03	07	-14	-05
28	-33	-33	-60	47	18	11	-24	03	-12	21
29	00	-61	-54	08	42	-08	-21	09	24	-09
30	-18	-48	-38	62	06	-23	17	-24	-18	-10
31	64	-43	-08	-37	-23	-32	-22	-09	02	-03
32	84	10	-21	-25	09	-32	12	03	-13	-05
33	82	-32	20	-17	-05	-21	-09	-09	16	-10
variance	13.29	7.97	3.66	1.94	1.66	0.76	0.69	0.47	0.40	0.38
% total var.	40.3	24.2	11.1	5.9	5.0	2.3	2.1	1.4	1.2	1.1

A. Fellow-students: Matrix of rotated factors Appendix 19.

	I	II	III	IV	V	VI	VII	h^2
1	43	-22	47	-62	16	28	07	95
2	48	-10	51	-61	16	25	01	97
3	82	10	36	-26	-01	23	17	96
4	75	-31	-07	-08	00	25	26	81
5	81	29	22	-34	00	02	-13	93
6	84	05	21	-09	-13	22	13	83
7	-27	06	-89	21	-03	-01	08	93
8	-25	04	-89	18	-09	-06	-03	90
9	-09	16	-83	38	-09	14	-11	91
10	-82	28	-38	20	01	10	06	94
11	01	-53	54	-48	33	12	00	93
12	-78	14	-03	-38	07	-36	-15	92
13	-41	63	-32	39	-28	07	-06	91
14	-34	76	-24	40	-17	08	-14	96
15	-32	76	-21	29	-25	18	-10	92
16	-45	05	-45	73	-11	04	02	95
17	24	10	-17	85	-08	22	12	89
18	-46	06	-49	59	-32	-15	13	94
19	-55	10	-39	66	05	04	-11	93
20	-34	04	-23	63	31	-06	-47	89
21	91	-08	26	-10	09	02	09	93
22	84	19	-05	05	-07	06	-18	79
23	66	-14	63	-20	01	-03	-03	89
24	91	18	10	-26	-10	03	-04	96
25	23	83	08	-05	-12	37	09	92
26	17	56	23	-26	-09	33	-32	68
27	65	-03	31	-64	05	07	-01	93
28	37	42	-21	16	-55	33	22	84
29	28	29	-01	05	-07	85	00	89
30	12	15	-12	07	-89	02	-04	84
31	09	77	00	15	15	03	43	83
32	-85	13	-32	27	14	-07	-06	94
33	07	88	-17	-13	-01	-17	-10	86
Variance	9,990	5,011	5,115	5,150	1,774	1,729	0,879	29,650
Per cent of comm.variance	33,7	16,3	17,3	17,4	6,0	5,8	3,0	
" " " total "	30,3	15,2	15,5	15,6	5,4	5,2	2,7	

B. Well-known persons and personality concepts: Matrix of rotated factors Appendix 20.

	I	II	III	IV	V	VI	VII	h^2
1	-68	-12	63	-10	01	18	-13	93
2	-71	-07	63	00	01	15	-12	95
3	-82	24	28	-08	27	02	01	89
4	-84	07	-49	-07	-05	-07	-12	97
5	-60	24	55	21	33	-10	-22	93
6	-93	14	00	-03	12	-04	-12	92
7	-19	-16	-08	90	-14	08	00	90
8	03	-17	-09	93	-02	14	-04	92
9	-35	05	18	87	07	-09	01	93
10	49	-26	-47	36	-43	19	-18	91
11	29	-73	-13	-01	-16	51	-07	92
12	57	-08	67	34	-12	17	-01	94
13	44	76	-30	-09	17	08	-09	91
14	-15	93	-08	-25	11	-02	-01	96
15	-11	93	-08	-11	09	12	06	93
16	18	-11	-94	14	-12	06	07	96
17	-15	11	-95	-12	10	04	06	96
18	05	-20	-74	15	-35	-08	38	89
19	43	07	-85	06	05	10	-05	93
20	77	18	-39	-03	27	19	-09	90
21	-94	03	-05	17	08	07	-09	94
22	-84	24	12	34	-08	-06	-17	93
23	-45	21	18	-74	-07	19	06	87
24	-93	10	15	24	06	-01	-07	96
25	-36	83	24	-05	17	-03	-11	93
26	-73	49	30	-03	21	07	02	91
27	-35	03	45	06	10	00	-75	91
28	-89	22	-05	15	09	06	-01	88
29	-58	18	07	53	-02	51	05	91
30	-61	-12	34	53	-04	-09	13	81
31	-04	35	-03	-06	89	-01	-06	92
32	92	-05	-24	14	-02	05	-01	92
33	-26	54	47	09	57	-05	-16	94
Variance	11,285	4,799	6,265	4,255	1,952	0,832	0,998	30,388
Per cent of comm.variance	37,1	15,8	20,6	14,0	6,4	2,7	3,3	
" " " total "	34,2	14,5	19,0	12,9	5,9	2,5	3,0	

C. Photographs: Matrix of rotated factors

Appendix 21.

	I	II	III	IV	V	VI	VII	h^2
1	39	27	-77	15	-02	31	04	94
2	48	19	-73	20	-05	32	01	94
3	50	-20	-64	26	-11	26	09	86
4	87	37	-08	-07	-01	05	00	91
5	59	-33	-64	03	-05	-13	12	89
6	88	07	-35	-01	01	03	-06	90
7	16	-03	35	-86	02	01	21	94
8	09	29	40	-81	-03	-03	-13	93
9	35	-62	-20	-30	-01	-21	45	88
10	-33	22	78	-25	07	30	13	95
11	18	89	-06	02	03	09	-14	86
12	-73	-38	-38	05	26	-05	18	93
13	-25	-92	20	09	-03	-02	00	96
14	-06	-95	16	09	00	03	03	94
15	-13	-95	00	02	-11	06	02	94
16	02	21	96	-07	-04	05	01	97
17	30	09	88	-14	-12	-04	-21	94
18	-31	08	88	-05	-10	12	-14	92
19	10	-09	90	-19	20	15	19	96
20	-12	-63	52	-08	41	-08	17	90
21	92	23	-01	-09	04	-07	00	92
22	93	-09	-15	-12	01	-14	01	94
23	67	-01	-48	28	20	03	-33	90
24	87	02	-30	-09	-20	-15	08	92
25	07	-88	-39	10	03	05	01	95
26	25	-81	-36	19	-03	19	09	93
27	47	03	-80	10	-17	15	09	94
28	78	-29	19	-07	-23	24	-02	84
29	92	-01	-10	-04	04	21	08	91
30	62	-19	-04	-04	-71	01	-15	95
31	-19	-56	-15	-07	20	06	73	96
32	-80	-23	35	-15	28	05	17	94
33	00	-80	-43	-07	08	-28	05	91
Variance	9,373	7,587	8,399	1,978	1,135	0,771	1,216	30,462
Per cent of comm. variance	30,8	24,9	27,6	6,5	3,7	2,5	4,0	
" " " total. "	28,4	23,0	25,5	6,0	3,4	2,3	3,7	

D. Handwriting: Matrix of rotated factors Appendix 22.

	I	II	III	IV	V	VI	VII	h^2
1	-88	08	-30	07	-12	-07	12	90
2	-91	01	-24	06	-03	-09	09	90
3	-54	-30	-61	31	22	-13	-04	91
4	-25	-01	-87	-07	-03	16	09	86
5	-27	-56	-25	61	-10	-09	19	88
6	-31	-20	-74	41	11	05	04	86
7	85	07	22	10	07	-06	30	89
8	78	-02	18	05	-18	-19	50	96
9	64	-47	07	14	35	-14	13	81
10	81	07	37	-05	-02	01	12	82
11	-36	70	-23	-22	-27	-31	-06	90
12	-23	-41	77	-03	-02	02	02	82
13	18	-91	22	-07	-05	03	-07	92
14	01	-93	-15	-13	14	02	10	93
15	00	-95	02	04	-09	-16	-10	94
16	87	19	-18	-08	09	-04	-18	88
17	73	11	-45	-15	-29	-04	17	88
18	77	02	-02	-30	-39	12	-18	88
19	88	-21	-15	-19	09	-18	09	92
20	42	-37	06	11	20	-73	07	90
21	-38	02	-71	17	05	-36	-20	85
22	-40	-34	-75	-06	18	-05	-02	87
23	-82	19	-34	-09	16	08	09	87
24	-60	-35	-53	19	22	-21	10	90
25	-13	-86	-02	13	03	-09	-06	79
26	-37	-74	-25	17	17	-26	21	91
27	-49	-13	-46	52	13	-18	-19	83
28	18	-60	-63	-12	04	-02	05	82
29	11	-58	-59	36	07	-09	-14	87
30	17	-68	-44	27	23	06	31	91
31	-06	-42	-32	-03	74	-14	-06	85
32	64	-12	60	-17	-05	-22	17	90
33	-05	-80	-16	19	34	-14	-04	84
Variance	9,767	7,723	6,270	1,605	1,519	1,216	0,866	28,968
Per cent of comm.variance	33,7	26,7	21,6	5,5	5,2	4,2	3,0	
" " " total "	29,6	23,4	19,0	4,9	4,6	3,7	2,6	

E. Irrelevant concepts: Matrix of rotated factors Appendix 23.

	I	II	III	IV	V	VI	VII	h^2
1	08	-90	11	17	03	-20	03	90
2	19	-89	16	15	03	-11	07	90
3	16	-79	00	39	21	-08	-01	85
4	-36	-72	36	03	09	19	18	85
5	66	-40	-36	35	-05	19	10	90
6	-16	-80	36	03	27	17	-02	90
7	-06	06	-19	12	-90	-05	24	92
8	09	42	-23	23	-77	-12	-16	92
9	25	26	-48	52	-42	-11	-10	83
10	-28	56	-61	03	-30	-23	11	92
11	-50	-43	68	11	04	17	-01	94
12	43	50	-35	07	-50	-28	-20	92
13	20	26	-89	07	-17	-02	04	94
14	22	21	-89	03	-10	-03	-01	90
15	29	04	-89	-05	-19	-02	-16	94
16	-94	07	15	05	06	-01	02	92
17	-79	-18	34	-05	23	19	10	88
18	-76	32	18	04	21	38	21	95
19	-88	-14	06	15	-27	-04	-21	93
20	15	-09	-48	-02	-75	-11	-15	86
21	-30	-66	48	00	22	25	-16	91
22	-19	-84	17	25	-21	04	-19	91
23	09	-48	68	-25	28	04	-29	93
24	-07	-97	-02	-01	-04	14	-10	98
25	36	-46	-63	-10	-29	-23	-19	93
26	55	-26	-62	15	-18	-17	-16	87
27	34	-85	-04	21	15	-07	07	92
28	-21	-29	13	84	-08	12	-16	90
29	-13	-43	-41	71	02	-14	00	90
30	17	-31	17	74	-24	10	32	88
31	21	-10	-53	-10	-35	-69	-01	94
32	00	42	-67	-09	-29	-36	33	95
33	50	15	-60	-12	-19	-47	05	91
Variance	5,754	8,712	7,318	2,713	3,472	1,589	0,813	29,974
Per cent of comm.variance	17,9	29,1	24,4	9,1	11,6	5,3	2,7	
" " " total "	16,2	26,4	22,2	8,2	10,5	4,8	2,5	

		B							C							D							E							
		1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	
	1	-87	14	39	-12	30	-08	-37	-86	13	-63	26	-28	01	-14	-69	-07	-83	56	23	-07	-04	13	-87	41	23	40	29	-18	1
	2	-18	85	07	14	58	-02	-12	02	-88	-03	-05	-04	00	41	14	-90	-10	22	47	-24	07	36	04	-80	20	-40	-51	-17	2
	3	-29	-07	49	-67	12	12	-22	25	26	-66	80	01	22	-29	-88	24	-31	21	-02	06	-35	22	-55	43	-22	65	12	-18	3
A	4	36	20	-83	16	-04	-09	43	-23	-27	87	-41	10	-17	09	84	-17	13	-41	-01	-09	07	-52	45	-25	01	-28	07	06	4
	5	36	-31	05	-27	06	24	-25	-27	33	-14	09	76	-05	21	-22	52	26	-11	-07	-28	-21	02	01	13	-55	05	-25	-17	5
	6	-57	33	01	12	14	47	-16	61	-14	-17	08	-21	57	08	-14	-37	-60	34	11	-19	03	-07	-55	-14	55	06	-04	-09	6
	7	-25	-16	-15	-07	08	-14	08	14	34	00	-05	-23	29	08	-03	25	-28	-13	02	44	-19	-31	-15	33	00	34	02	29	7
	1								-90	06	52	-10	46	-18	05	51	33	85	-54	-28	04	-12	-11	80	-20	-49	-21	-21	14	1
	2								15	-88	-18	20	04	-04	20	-12	-85	-23	23	38	-17	-04	41	-14	-66	05	-16	-29	-32	2
	3								17	-17	-91	32	-12	-03	10	-72	-21	-01	55	26	01	09	82	-30	-10	17	-02	-28	-13	3
B	4								18	-02	17	-79	-23	-08	35	47	-22	02	29	11	-24	45	-01	08	-25	62	-66	-12	17	4
	5								15	-58	-36	13	18	-17	54	-22	-52	-30	39	67	-40	00	45	-24	-38	04	-17	-53	-17	5
	6								17	13	04	-08	25	47	-01	-03	-01	-10	-01	-11	-46	03	-17	-19	-05	27	-21	-17	-23	6
	7								-31	07	45	-01	-04	-10	-25	32	17	27	-55	-26	34	01	-30	46	15	-11	11	26	08	7
	1															-39	-22	-91	52	25	-18	13	-10	-85	32	55	16	32	-19	1
	2															-07	89	-05	-22	-48	28	-07	-54	-10	82	-13	43	45	23	2
	3															87	18	27	-59	-29	-01	05	-71	54	-02	-10	-20	19	17	3
C	4															-67	-01	-13	04	00	20	-54	23	-26	14	-23	68	08	-15	4
	5															05	14	34	-25	08	-31	-15	03	23	-16	-49	-22	-39	-36	5
	6															-11	00	-21	-01	-12	-03	01	-18	-30	00	33	10	-12	08	6
	7															16	-35	06	20	66	-37	03	24	04	-53	18	-51	-66	-01	7
	1																						-45	64	-27	10	-45	-03	27	1
	2																						-45	14	74	-43	41	34	18	2
	3																						21	85	-32	-43	-30	-27	12	3
D	4																						51	-50	-18	41	-06	-08	02	4
	5																						34	-23	-30	18	-29	-58	-20	5
	6																						-09	28	30	-19	49	28	29	6
	7																						18	03	-15	29	-57	-11	13	7

Appendix 24: Table of coefficients of congruence between the factors of the separate groups.