

'TYPE'-FACTORS IN AESTHETIC JUDGEMENTS

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I. THE PROBLEM

WHEN we analyse a table of correlations between the rankings of pictures or other aesthetic material by a number of subjects, we almost always find that the first factor to be extracted is a general factor with saturations which are positive throughout. The nature of this general factor has been discussed in a previous article(1); the 'T'-factor, as it was called there, was shown to extend over eighteen different tests of visual aesthetic appreciation, and to correlate with general factors extracted from tests of colour appreciation, appreciation of polygonal forms, and of preferences for odours.

When the influence of this factor is eliminated, a secondary, bipolar factor can be found, which has positive and negative saturations in roughly equal numbers. Factors of this kind may be of great interest and importance, dividing as they do the population into different groups or 'types'; but they also present special difficulties to the investigator. As Davies has shown in her survey of researches involving correlations between persons, the influence of the bipolar factor is generally considerably smaller than that of the general factor; on the average, she found the general factor to be approximately five times as strong as the bipolar factor(2) (p. 412).

She also found that in the majority of cases the residuals on which the bipolar factors were based were not statistically significant. 'In forty-four out of the forty-eight researches...examined the first factor will account for all the variance and covariance within the limits imposed by the probable error" (p. 418). In particular, in none of the twelve re-

searches involving aesthetic material was a statistically significant second factor to be found.

We are, then, faced with the problem of increasing the relative influence of the bipolar factor, and of reducing or eliminating the influence of the general, positive factor. This problem, as I shall endeavour to show, can best be solved by the suitable selection of experimental material.

II. RANKING OF PICTURES

Great differences in 'goodness' among the pictures in a test produce a particularly strong general factor in that test. Consequently, as far as practicable, the pictures in each of the five sets used in this research were selected with a view to making them equal in 'goodness'; for that purpose only pictures of acknowledged merit were chosen. It might be objected that such a conventional standard is not necessarily the correct one to take; the relative success of our effort to reduce the importance of the '*T*'-factor, and to increase the importance of the various bipolar factors, is perhaps sufficient answer to this objection.

The five sets of pictures used are described below. They were:

Set A. Fifty-one landscape paintings, reproduced on postcards. The selection of artists is fairly representative, covering the period from Dürer's time to our own.

Set B. A further fifty-one landscape paintings, reproduced on postcards. The selection was similar to that described above.

Set C. Thirty-two portrait paintings, reproduced on postcards. The artists whose work is included here range from the early Italians to Modigliani and Kissling.

Set D. Thirty-two photographs of statues. The artists whose work is included were Kolbe, Maillol, Barlach, and Klimpsch.

Set E. Fifty-one landscape photographs, uncoloured, by a well-known Austrian artist, Dr Defner. All these pictures were hand-produced. Dr Defner himself was kind enough to select 108 photographs, from his stock of several thousand, which to him appeared of roughly equal merit; a further selection was then made by three judges who had scored particularly highly in the '*T*'-test.

Thus altogether two hundred and seventeen pictures were used in this part of the investigation. Fifteen subjects were asked to rank the pictures in each set in order of liking, using a scheme of grouping which closely approximated to the normal distribution curve. The subjects were artists, university students, bank clerks, typists, and teachers, eight women and seven men. Their ages ranged from about twenty to seventy.

These rankings were correlated, and from each of the five tables of correlations two factors were extracted. The first factor extracted was significant in every case; the second factor was significant in every test

except the 'statues' test. The significance of the second factor was tested by examining the significance of the residuals on which it was based; the criterion used was Fisher's test of the difference between the theoretical and the actual correlations, expressed in terms of their inverse hyperbolic tangents ($z = \tan h^{-1} r$).

III. RESULTS AND CONCLUSIONS

The percentages contributed to the variance by the first and second factors in each of the five tests are given in Table I.

Table I

Test	Percentage of variance	
	Factor 1	Factor 2
	%	%
A Landscapes A	35	12
B Landscapes B	31	12
C Portraits	27	17
D Statues	29	8
E Photographs	14	11
Average	27	12

In three of the tests, the 'T'-factor is the first to appear; in the two Landscape tests its influence has been sufficiently weakened to let the bipolar factor appear first. In these two tests, the 'T'-factor appears as a bipolar factor, which is of course due to the method of analysis which inevitably makes the second factor to be extracted have both positive and negative saturations.

Our reason for assuming that the factor appearing in all these tests is 'T' lies in the fact that the factors extracted from the two Landscape tests and the Photographs test correlate significantly with those extracted from the Portraits and Statues tests; but as these two tests had also been included among the eighteen 'T'-tests, we know that both are highly saturated with 'T' (cf. (1), Table I). The intercorrelations of the five tests for this factor are given in Table II, together with their standard errors.

Table II

	B	C	D	E
A	0.341 ± 0.24	0.147 ± 0.26	0.492 ± 0.21	0.131 ± 0.26
B	—	0.459 ± 0.21	0.666 ± 0.15	-0.050 ± 0.27
C	—	—	0.446 ± 0.22	0.126 ± 0.26
D	—	—	—	-0.030 ± 0.27

When this table is analysed, the saturations shown in Table III are found for the five tests.

Table III

Test	Saturation
A Landscapes A	0.519
B Landscapes B	0.714
C Portraits	0.551
D Statues	0.829
E Photographs	0.070
Variance	0.355

We are not, however, primarily concerned with the 'T'-factor; the table given above lends support to the conclusions reached in our previous paper, by showing that the influence of 'T' extends also to landscape paintings and photographs. But our chief interest lies in the other factors, an examination of which may throw further light on the nature of aesthetic judgements.

The first question that suggests itself in this connexion is: What is the meaning of these bipolar factors? We can answer this question by examining the pictures which characterize the positive and negative aspects of the factors respectively.

As regards the two landscape tests, the answer is clear enough. We are dealing here with an opposition between such artists as van Gogh, Corinth, Kokoschka, Cézanne, and Gauguin on the one hand, and Constable, Ruisdael, Rubens, Wilson, and Hobbema on the other. The one group of subjects prefers the modern, impressionistic, colourful pictures; the other group prefers the older, more conventional, less colourful pictures. Such a dichotomy has of course often been suggested on theoretical grounds; Dr Dewar also found some evidence of it in her research (3), p. 36), but none of the residuals on which this suspected factor was based was as high even as three times its probable error.

As regards the portraits, we find a similar opposition between artists such as Modigliani, Augustus John, and Laurencin on the one hand, and Reynolds, van Eyk, and Botticelli on the other. Again one group prefers the modern, colourful pictures, the other group the older, more conventional ones.

The distinction in the photographs test is not so clear, but one group seems to prefer the sunlit, bright, happy landscapes, with trees and clear skies, while the other group prefers dark, foreboding landscapes, with overcast skies and wild, drifting clouds.

The main opposition in the statues test seems to be between the art of Kolbe and Klimpsch, and that of Barlach and Maillol. This opposition has been expressed with great insight by Carls, in his book on Barlach: "Not adoration of form but adoration of truth determined Barlach's

creative life... Thus it follows that Barlach is a destroyer of form (Formaufwähler), not a confirmer of form (Formfestiger). Kolbe creates the beautiful, Barlach the characterful" (4), p. 18).

From the descriptions given above of the bipolar factors entering into these five tests, it will be fairly clear that those extracted from the two landscape tests and from the portraits test are very similar. Does this similarity also extend to the two other tests? This question can best be answered in the form of a table giving the intercorrelations of the bipolar factors (Table IV).

Table IV

	B	C	D	E
A	0.957 ± 0.02	0.701 ± 0.14	0.548 ± 0.19	0.327 ± 0.24
B	—	0.813 ± 0.09	0.496 ± 0.20	0.437 ± 0.22
C	—	—	0.406 ± 0.22	0.642 ± 0.16
D	—	—	—	0.340 ± 0.24

When this table is analysed, the saturations shown in Table V are found for the five tests:

Table V

	Test	Saturation
A	Landscapes A	0.867
B	Landscapes B	0.939
C	Portraits	0.876
D	Statues	0.559
E	Photographs	0.542
	Variance	0.601

It would appear, then, that we are dealing with one factor running through all the five tests. This factor has been called the 'K'-factor; it differentiates, as we have seen, those who like modern art, bright, sunny photographs, and Kolbe statues, from those who like the older masters, cloudy, foreboding photographs, and the statues of Maillol and Barlach. The following suggestion may be offered as an explanation of this factor.

Gestalt psychologists, in particular Hornbostel, have drawn attention to what they have termed 'intersensory perception' (cf. (5), pp. 145 *et seq.* for a summary of this work). In particular, stress is laid on a 'brightness factor', which is apparent in music, vision, and other sense modalities.

It appears possible that we are dealing here with this same factor of brightness. The 'lovely bright colours' of the modernist contrast with the duller colours of the older masters; in a similar way the bright, sunlit photographs preferred by one group contrast with the dark, cloudy pictures liked by the other group. The statues created by Kolbe are bright and happy in the main—'schicksallos schön', as Carls says—while those created by Barlach are 'schicksalhaft betont'.

IV. RELATION TO TEMPERAMENTAL FACTORS

Whether this hypothesis be accepted or not, the reality of the 'K'-factor can hardly be doubted. In order to explore the psychological ramifications of this factor further, it was decided to correlate it with tests of temperamental and other qualities of psychological interest. But before proceeding to find the relation of the 'K'-factor to these qualities, it became necessary to construct a short, yet accurate, test of this factor. The five tests described above, suitably weighted, would of course constitute the best test available; but these tests take too much time, both in the giving of the test, and in the calculation of the results, to be used on a larger number of subjects.

Hence what will be called the 'K'-test was constructed. As the opposition between the two types of pictures which characterize this factor is most clearly manifested in the two landscape tests and the portraits test, only pictures from these tests were used in the 'K'-test. Altogether, one hundred pairs of pictures were chosen, in such a way that one of them exemplified the 'bright' or modern type of picture, the other the older type. These pairs were selected, wherever possible, so that the subject portrayed was more or less the same—a bridge, a mill, mother and child, and so on.

The pictures used were taken from the three tests described above, and also from several preliminary tests which showed essentially the same opposition between the two types. That this test measures much the same factor which appeared in the five original tests becomes clear when we correlate the score of the original fifteen subjects in the 'K'-test with their average saturations in the five tests. The correlation is 0.886, with a standard error of 0.06. The split-halves reliability of the test is 0.921 ± 0.03 , for thirty subjects. Sixty-eight pictures out of the two hundred were portraits, one hundred and thirty-two were landscapes.

Groups of subjects of varying size (between thirty and fifteen in number) were given this test, and also one or more of the five tests described on the following pages, in order to find out something about the relations between the 'K'-factor and the other qualities tested. Each of these tests was thought on *a priori* grounds to be related in some way to the 'K'-factor.

(1) *Extraversion—introversion*. It is not a new idea that there may be a connexion between temperament and aesthetic preferences; such a connexion is posited for instance on experimental grounds by Burt⁽⁶⁾, and on mainly theoretical grounds by Evans⁽⁷⁾.

In this investigation, the Heidbreder test of introversion (8) was given to fifteen subjects; in addition each subject was judged by two independent judges with regard to the degree of extraversion or introversion he exhibited. There was fair agreement between the judgements and the results of the test, and a mean value was taken.

The correlation between extraversion and the 'K'-factor is definitely significant, being 0.723, with a standard error of 0.13. The extravert tended to prefer the 'bright', modern type of picture, the introvert tended to prefer the older masters.

(2) *Radicalism—conservatism.* It is a matter of everyday observation that radicals in politics and morals also tend to be radical in their artistic preferences; we would not expect the socialist and the conservative to have similar views on the merits of Laurencin or Modigliani.

Accordingly Vetter's radicalism—conservatism test (9) was given to fifteen subjects; in addition each subject was judged by two independent judges with regard to the degree of radicalism or conservatism he exhibited. Again, there was fair agreement, and a mean value was taken between the ratings and the scores on the test.

The correlation between the 'K'-factor and radicalism is almost exactly the same as that between extraversion and 'K', namely, 0.721 ± 0.13 . This correlation also is definitely significant.

(3) *Youth—old age.* Young people might be expected to prefer the 'bright' type of picture, while those of an earlier generation might be expected rather to prefer the older masters. This expectation is borne out when age is correlated with the results of the 'K'-test; the correlation is 0.390, with a standard error of 0.16.

(4) *Preference for colour—preference for form.* It was considered likely that preference for colour might be correlated with high 'K'-scores, and preference, for form with low 'K'-scores. In order to test this hypothesis, a test was constructed which in some ways is an elaboration of tests described by Feasey (10), Yokoyama (11), and Oeser (12).

The subjects in this test were required to rank in order of liking ten polygons (taken from Birkhoff's collection (13)), and also ten colours (taken from Ostwald's selection of coloured papers (14)). When they had done this, they were required to rank in order of liking ten coloured polygons, in which the colour and the form were combined in such a way that the best-liked colour was put with the worst-liked form, and vice versa. Thus a conflict was set up within the individual, and the way in which this conflict was resolved indicates which of the two characteristics—colour and form—had more influence on the subject's

aesthetic preferences. (It was of course necessary for this test to prepare beforehand a set of the polygons cut out in each of the colours.)

This test correlated with the 'K'-test to the extent of 0.323, with a standard error of 0.17. This correlation, although highly suggestive, cannot be regarded as statistically significant.

There is also a correlation of 0.472 ± 0.24 between the colour—form test and the extraversion—introversion test. This correlation, which is on the borderline of significance, would seem to suggest that further experimentation with this test might well be worth while; particularly so as positive results were obtained from other colour—form tests by Scholl⁽¹⁵⁾, and Enke⁽¹⁶⁾, and also by Rohrschach⁽¹⁷⁾. A review of this work is given by Kretschmer⁽¹⁸⁾, pp. 190 *et seq.*

(5) *Preference for bright colours—preference for subdued colours.* It has been suggested that in preferences for colours a bipolar factor becomes evident which divides those who prefer bright from those who prefer subdued colours⁽¹⁹⁾. As it was thought that preference for bright colours might be related to preference for the 'modernist' aspect of the 'K'-factor, a score was derived from the rankings of the ten colours used in the preceding experiment, which expresses in the form of a ratio the relative preference of each subject for the bright and the subdued colours.

This ratio, however, does not correlate significantly with 'K'; the correlation is 0.182, with a standard error of the same size.

V. SUMMARY

We are now in a position to summarize the results of our investigation. We found that the same two factors were active in each of the five sets of pictures used. One of these factors was the 'T'-factor, which was discussed in an earlier article. The other factor, 'K', seemed to divide the population into two different 'types', one preferring the modern, the other the older style of painting. This factor, identified provisionally with 'brightness', correlated with extraversion, radicalism, youth, and possibly with preference for colour. The colour—form test also appeared to be correlated with extraversion. These results are definite enough to suggest that further research into the relation between temperament and aesthetic preferences will prove fruitful not only in extending our knowledge of the 'type' factors in aesthetic judgements, but also in increasing our understanding of temperamental 'types'.

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