

## VARIABLE FACTORS ENCOUNTERED IN THE RATING OF STUDENTS

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In the Personnel Program at Joliet Township High School and Junior College, considerable attention is being given to the rating of students on character qualities. The problem of preserving the ratings in convenient and workable record form presented itself at the outset. Two courses were open to us—that of keeping a record of each separate rating by every teacher, or the somewhat easier method of recording an average of all ratings (of a student on any quality) made at a stated time. The purpose of the study described in the present paper was to test the soundness of the practice of averaging ratings.

Near the close of the first semester of the school year 1923-24, more than sixty members of the faculty rated a large percentage of high school and junior college students on the following general qualities: application, ability to organize, accuracy, punctuality, aggressiveness, and social qualities. A blank was used which presented particular descriptive statements for each degree of each general quality. Preceding the rating several conferences were held with teachers who participated. Teachers were asked to rate only the students in their own classes or groups. Correlations between the ratings of twenty-three pairs of teachers who had rated groups sufficiently large for purposes of comparison were determined by means of the Pearson Product-Moment Formula. Coefficients varied from  $-.30$  for the ratings of an English and an Algebra teacher on social qualities to  $.89$  for the ratings of two stenography teachers on accuracy. A general summary of correlations is presented in Table I.

TABLE I.  
Summary of Correlations

*Teacher	Teacher	Application	Ability to Organize	Punctuality	Accuracy	Aggressiveness	Social Qualities	Average
MP <sup>2</sup>	MC <sup>1</sup>	.42	.45	.71	.45	.26	.49	.46
MD <sup>1</sup>	WG <sup>1</sup>	.36	.61	.21	.82	.61	.53	
WM <sup>3</sup>	WHE <sup>3</sup>	.33	.36	.41	.30	.33	.55	.39
WST <sup>1</sup>	WST <sup>2</sup>	.72		.28	.89	.50		.60
WE <sup>2</sup>	WM <sup>3</sup>	.56	.34	.74	.69	.36	.47	.53
WE <sup>4</sup>	WHE <sup>1</sup>	.66	.69	.44	.63	.33		.55
WPS <sup>1</sup>	WH <sup>2</sup>	.52	.70	-.18	.54	.73	.61	.55
MM <sup>3</sup>	MP <sup>2</sup>	.83	.78	.52	.78	.86	.51	.71
MP <sup>1</sup>	WF <sup>1</sup>	.54				.38		.46
MA <sup>c</sup>	WH <sup>2</sup>	.45	.35	.00	.42	.63		.37
WST <sup>1</sup>	WH <sup>1</sup>	-.13	.14	.05	.22	.00		.06
MB <sup>2</sup>	WL <sup>1</sup>	.73	.77	.57	.68		.80	.71
MP <sup>2</sup>	WPS <sup>1</sup>	.22	.74	.00	.43	.69	.43	.42
WE <sup>5</sup>	WG <sup>1</sup>	.64	.45	.87	.59	.28	.73	.51
MP <sup>1</sup>	WPS <sup>1</sup>	.31				.47		.39
ME <sup>1</sup>	WA <sup>1</sup>	.70	.54	.71	.59	.38	-.30	.44
WE <sup>5</sup>	MD <sup>1</sup>	.50	.26	.20	.41	.16	.19	.29
WE <sup>2</sup>	MSC <sup>1</sup>	.74	.24	.31	.47	.22	.20	.36
WM <sup>4</sup>	WL <sup>1</sup>	.44	.59	.35	.49	-.23	.80	.41
WE <sup>3</sup>	WHE <sup>2</sup>	.73	.51	.71	.41	.50	.13	.50
ME <sup>3</sup>	MZ <sup>1</sup>	.51	.67	.37	.50	.55		.52

The correlation coefficients presented in Table I become all the more interesting when it is noted that the correlations for certain of the general qualities seem in general to vary consistently according to the nature of the teacher-subject combinations. Conspicuous examples of high correlations appear with reference to certain qualities when the ratings of teachers of similar subjects are compared. Conspicuous examples of low correlations appear when the ratings of those who teach subjects obviously dissimilar in organization, content, and method are compared. Noting this, the writer was led to devise a scheme for a more minute analysis. It was assumed that certain of the general qualities such as ability to organize, and accuracy are more likely to vary in accordance with the changes in the subject back-

\*Key for interpreting symbols designating teachers:

1The first letter in the combination indicates sex of rater, M-man; W-woman.

2The second letter or group of letters indicates subject taught by teacher, as follows: E-English; HE-Home Economics; ST-stenography-typewriting; M-mathematics (general); A-algebra; G-geometry; P-physics; C-chemistry; B-biology; Z-zoology; D-mechanical drawing; SC-industrial science; L-Latin; F-French; Ac-accounting; H-History; PS-public speaking.

3The small figure to the right of letters indicates the number assigned to the teacher in his or her department.

grounds than are other qualities which are more general in character, such as punctuality and social qualities. Combinations were made of subjects which appear to be similar. Correlations between the ratings of teachers of these subjects were compared with correlations between the ratings of those teaching subjects estimated by the writer as dissimilar.

Table II presents estimates made by the writer as to similarity and dissimilarity of separate pairs of subjects. It must be held in mind that these estimates are wholly arbitrary. No attempt was made, objectively, to analyze the subjects involved. It would seem, however, that the assumptions are justified.

TABLE II.

Estimated Similarity and Dissimilarity of Subject Combinations.

Similar or Partially Similar Subject Combinations.	
Mathematics .....	Physics
Stenography .....	Stenography
*English .....	Home Economics
*Public Speaking.....	History
*English .....	Zoology
Physics .....	Chemistry
Mechanical Dr. ....	Geometry
Dissimilar Subject Combinations.	
Biology .....	Latin
English .....	General Mathematics
English .....	Geometry
Physics .....	French
English .....	Algebra
Physics .....	Public Speaking
Latin .....	General Mathematics
Home Economics.....	General Mathematics
Accounting .....	History
English .....	Industrial Science
English .....	Mechanical Drawing
Stenography .....	History

The meaning of the terms "similar" and "dissimilar" as used in Table II is as follows: The word "similar" is applied to subjects which are estimated as having a

\*The starred combinations of subjects are held to be partially similar for the following reasons:

- (1) English—Home Economics.—Classes place considerable emphasis on the writing of acceptable themes on such subjects as, "Modern Appliances in the Home", "Laundering", etc.
- (2) Public Speaking—History.—Fluency in expression is important in history recitation. Both subjects deal with materials of an abstract nature. Memory work is important in both.
- (3) English—Zoology.—The biological sciences lay a great deal of stress on acceptable note books which are quite influential in helping to determine student's grade. The standards of organization, well expressed ideas, and neatness are common with English.

great deal in common, while "dissimilar" refers to subjects which are considered as having very little in common.

Percentages representing the total number of correlations for each general quality for both similar and dissimilar subject combinations are given in Table III. Percentages are distributed according to quartiles. For example: "38%" is opposite "application" in the column headed "similar". This means that thirty-eight percent of the total number of correlations between ratings of teachers of similar subjects, for the general quality "application", are in the highest quartile of the distribution for this quality. "15%" in the column headed "dissimilar" means that fifteen percent of the total number of correlations between ratings of teachers of dissimilar subjects are in the highest quartile of the distribution for the quality application.

TABLE III.  
Percentages of Correlations Distributed by Quartiles.

	Highest Quartile		Second Quartile		Third Quartile		Fourth Quartile	
	Sim-ilar	Dis-sim-ilar	Sim-ilar	Dis-sim-ilar	Sim-ilar	Dis-sim-ilar	Sim-ilar	Dis-sim-ilar
Application	38%	15%	19%	31%	31%	23%	12%	31%
Ability to Organize	36%	18%	36%	18%	29%	23%	00%	41%
Punctuality	21%	27%	36%	18%	36%	18%	07%	36%
Accuracy	38%	18%	31%	18%	19%	27%	13%	36%
Aggressive-ness	37%	17%	37%	17%	13%	33%	13%	33%
Social Qualities	10%	33%	50%	11%	20%	28%	20%	28%

Data of Table III are presented in graphic form in Figures 1 and 2. Figure 1 shows the distribution of correlations between the rating by teachers of similar subjects, and Figure 2 that of correlations between the ratings by teachers of dissimilar subjects. From the highest to the lowest quartile the curves for the general qualities, ability to organize, accuracy, and aggressiveness, show a decided slope from the upper toward the lower end of the scale in Figure 1, and a decided rise from the lower toward the upper end of the range in Figure 2. The curves for the qualities, application,

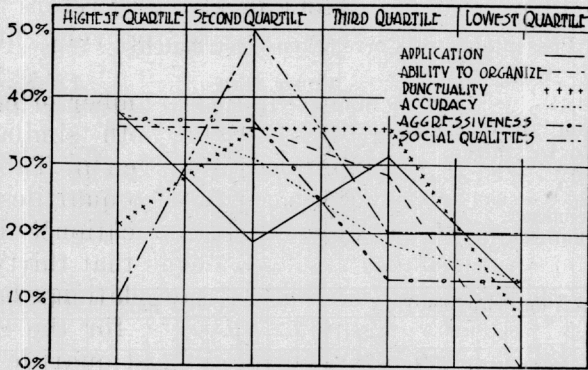


Fig. 1. Distribution percentages of correlations between ratings by pairs of teachers of similar subjects.

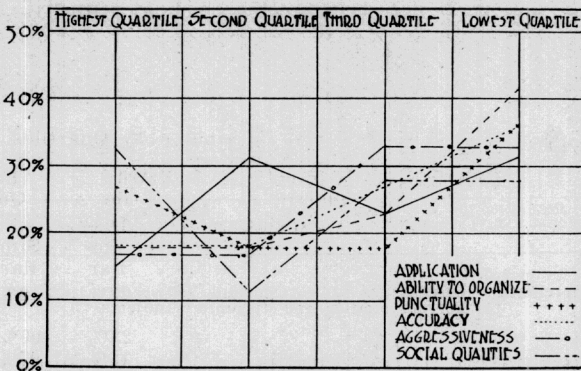


Fig. 2. Distribution percentages of correlations between ratings by pairs of teachers of dissimilar subjects.

punctuality, and social qualities slope and rise slightly in the direction of the others. This tendency is so slight, however, that considered along with the irregularity of the three curves, it seems inconsequential.

In consideration of the comparatively small number of correlations, and the small margin of difference in the size of correlations near the quartile division points, it seems advisable to supplement Table III and Figures 1 and 2 with a distribution of the total number of correlations by halves. Table IV shows the same data as are given in Table III. Data of Table IV are presented graphically in Fig. 3.

TABLE IV.

Percentages of Correlations Distributed by Halves.

	Upper Half		Lower Half	
	Similar	Dissimilar	Similar	Dissimilar
Application .....	57%	46%	43%	54%
Ability to Organize.....	71%	36%	29%	64%
Punctuality .....	57%	45%	43%	54%
Accuracy .....	68%	36%	32%	63%
Aggressiveness .....	74%	34%	26%	66%
Social qualities.....	60%	44%	40%	56%

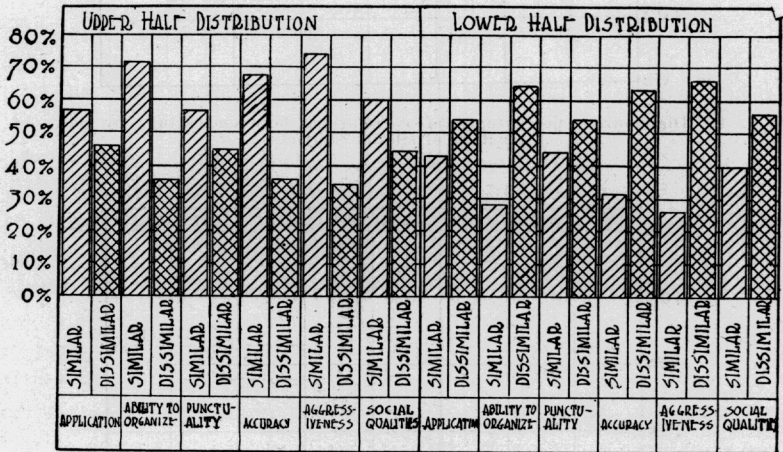


Fig. 3. Distribution percentages of correlations between ratings by pairs of teachers of similar and dissimilar subjects.

Approximately three-fourths of the correlations between ratings by teachers of similar subjects for each of the qualities, accuracy, ability to organize, and aggressiveness fall within the upper half of the distribution. A bare majority of correlations between like ratings for the remainder of the general qualities are also within the upper half of the distributions.

Table V presents the highest three and lowest three correlations for the qualities, aggressiveness, ability to organize, and accuracy, the qualities, correlations for which show relatively greater variation according to the subject backgrounds of the teachers rating.

TABLE V.

Highest Three and Lowest Three Correlations in Three Qualities.

Aggressiveness	Ability to Organize	Accuracy
(Highest three correlations.)		
Math. Physics ... .86	Math. Physics .... .78	Stenog-Stenog. ... .89
Public Speaking- History ..... .73	History-Public Speaking ..... .70	Mechanical Draw- ing-Math. .... .82
Physics-Public Speaking ..... .69	English-Home Ec- onomics ..... .69	Math. Physics ... .78
(Lowest three correlations.)		
Math.-Latin ...— .23	History-Stenog. ... .14	Stenography- History ..... .22
Stenography- History ..... .00	English-Industrial Science ..... .24	Mathematics- Home Econ.... .30
English-Mechanical Drawing ..... .16	English-Mechani- cal drawing .... .26	English-Mechani- cal Drawing .. .41

The highest three correlations for each quality, with the single exception of that for physics and public speaking under aggressiveness, are between the ratings of teachers of similar subjects. The lowest three correlations for each quality are between the ratings of teachers of dissimilar subjects. It may be noted, furthermore, that all the highest three correlations for accuracy are between ratings of teachers of strictly technical subjects.

## GENERAL SUMMARY

Correlations between the ratings of the several pairs of teachers show a wide variation. The wide variability is doubtless caused by many factors some of which, only, are apparent. The variation is greater for the ratings by certain pairs of teachers than for the ratings by other pairs of teachers. The variation is greater with respect to certain general qualities than with respect to others.

Correlations between the ratings by teachers of similar subjects are noticeably higher for the general qualities, ability to organize, accuracy, and aggressiveness; corresponding correlations are slightly higher for the general qualities, application, punctuality, and social qualities.

Correlations between ratings by teachers of dissimilar subjects are relatively lower for all the general qualities than are correlations between ratings by teachers of similar subjects. The correlations are decidedly lower for the qualities, aggressiveness, accuracy, and ability to organize.

## CONCLUSIONS

No sweeping conclusions should be reached on the basis of data presented in the present study. The number of correlations dealt with is limited. Rating results treated are the experiences of only one semester. These and other limitations should be held in mind as findings are evaluated.

It seems clear that the ratings on certain general qualities vary greatly according to the different interpretations given the quality by teachers possessing different subject backgrounds. If this is true, it is dangerous to average ratings of a student on any quality which are made by a heterogeneous group of teachers. Averages thus made and handed down will conceal many phases of the student's personality. It would seem that such averages can not be intelligently interpreted. However justified it may be to use composite marks and estimates in industrial personnel procedure, it is extremely questionable to borrow this policy and to apply it in school practice.

A record of careful ratings of the student by different teachers, which extends over a considerable period of time, should be looked upon as a wealth of information by the educational or vocational counsellor. In such a record will be found hints as to proper avenues for further investigation and study. Estimated weakness in any general quality in one department necessarily does not imply weakness in the same quality in a different department. The present study would seem to point the way to an informal and thorough consideration of each and every separate opinion which has been submitted by a careful and competent teacher. The personnel office must not choose the easiest way out, in its recording and interpreting of ratings.