

RELATIONSHIP OF APTITUDE, INTEREST, AND PERSONALITY TEST
SCORES TO PERFORMANCE AND JOB SATISFACTION
AMONG FIFTY FARMERS

by

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INTRODUCTION

Background

Concern over the agricultural population is justifiable for several reasons. Historically, farming is important. "Among ancient peoples, the landowner was regarded, along with the warrior, as the most respected and honored of men (1)." Many of our Founding Fathers, such as Washington and Jefferson were farmers, influenced by rural thinking. Less than 100 years ago the United States was still a predominantly agricultural country.

Economically farming is important. On farms are produced raw materials for much of the most vital necessities--food, clothing, and shelter. In 1940 about a sixth (17 percent) of the entire labor force was working as farmers, tenants, farm managers and foremen, or farm hands (14). According to Kolb and Brunner (15, p. 1) farming "gives employment to more persons than any other single industry."

Sociologically agriculture is important. According to Zeran (27) ". . . children reared in farm families exert a dominant influence upon the future . . ." For 1941 to 1946 the "net reproduction rate" (the number of children under five years of age per one thousand women of child-bearing age) was 976 for the urban population, 1,359 for rural non-farm, and 1,928 for farm (15, p. 40). A rate of 1,000 is required to maintain a stationary population.

Why is vocational guidance important for the prospective farmer? There are several things to consider. The number of farmers is decreasing. Between 1916, when the farm population was at its peak, and 1950 there was a loss of farm population of 25 percent (15, p. 28). While the number of "farms" under 10 acres has increased, the number of business size farms has actually decreased. Census figures for 1950 showed 5,379,043 farms, a decline of 500,000 since 1945 and of 700,000 since 1940. (A maximum of 200,000 of these may be accounted for by the change in definition of "farm" for census purposes.) (15, p. 64)

The combined result of these two trends was the ever increasing size of the average farm. In 1900 the size of the average farm was 146 acres. In 1940 it was 174 acres. By 1950 it had increased to 210.5 acres (15, p. 65).

At first glance it might seem that the problem of placing farmers is becoming less important since there are fewer and fewer of them in comparison to the total population. However, the importance of the individual farmer is seen when it is considered that this decreasing group will continue to provide at least the same amount of foodstuffs and other farm products and will possibly be called upon to produce more and more if the predictions for the huge increase in total population materialize. Kolb and Brunner (15) also state that "From these rural people has come a crop more important than any other: perhaps half the boys and girls born into rural homes in the last two generations migrated to the city and thus replenished the less fertile

urban population." With these facts in view it seems more important than ever that some effort be made to place in farming those who would be happiest and most efficient there.

The United States can scarcely afford to waste productive land on misfits. As Zeran (27) has said, it is essential that the selective processes function so that farm youth remaining will be those with "abilities to succeed in farming and who can contribute to the advancement of rural life." Likewise, those not fitted for farming are entitled to guidance for not only their own good, but that of family, community, and nation.

Former Secretary of Agriculture Claude R. Wickard (1, p. 7) once said:

More and more agriculture is becoming an exact science. It is a never-ending science, with many angles that open up avenues leading in all directions. The successful farmer still needs to have a love of the land, and practical experience, and plenty of courage and determination; but in addition he now needs a thorough grounding in the science of his calling. In the future this will be even more true.

This calls attention to the fact that more and more training is being required for all walks of life and farming is no exception. When specialized training is called for it is wise to try to predict in advance whether or not the individual will be satisfied and successful in his chosen field before he makes a large investment of time and money in his training. Zeran (27, p. 1) says:

The main purpose of any program of guidance is to enable individuals to make free choices, particularly vocational choices, which will result in better adjustments in their capacities as workers and citizens throughout adult life. These free choices, however,

must be rooted in the individual's knowledge of his own abilities and limitations, of the qualifications necessary for the vocation he is considering, and of the scope of the opportunities in the vocation open to him.

Again he says (27, p. 3):

The farm youth needs to understand himself. His aptitudes and potential abilities, his physical and psychological fitness, his interests and personal desires all have a bearing on whether or not he should take advantage of such occupational opportunities in farming as may exist.

Bingham (4, p. 213) also stresses the importance of guidance for farmers when he says, "In a field as vitally important as this, it is an achievement to increase the likelihood of satisfactory vocational adjustment by even a few percent over what it would otherwise be." He emphasized taking as many facts into consideration as possible to achieve the most dependable prediction.

In an article published post-humously, Bingham (5) estimates that 200,000 new farmers enter the occupation annually and that of these about 10 percent will find that it has been the wrong decision, judging by the number who turn to other occupations each year. He says:

Suppose some miracle of vocational guidance were each year to lead the 20,000 least promising entrants--ten percent of the total--away from farming toward occupations in which they need not fail, while an equal number of country boys with superior aptitudes for farming were diverted from attempting some city career for which they have no flair. Can you imagine how much more food this nation could soon be producing from the same acreage? At least fifteen percent more, worth at present prices \$2,700,000,000. How much good land would be rescued from serious damage? How much disappointment would be averted? How much more satisfaction would be achieved by these suitably placed men? Whatever the answer, you will recognize it as a far distant goal, but one toward which the American economy ought to be striving.

The importance of farming and, consequently, the necessity for adequate guidance procedures is well established. Basic to effective guidance is a body of knowledge about the characteristics of successful and satisfied farmers.

Review of the Literature

It is soon evident to anyone studying the problem that there is a marked lack of information on the interests, aptitudes, and personality traits of established adult farmers. The studies that have been made seem to fall mainly into three divisions--those comparing farm and non-farm students, follow-up studies of vocational agriculture students, and a few studies using subjective methods of individuals actually engaged in farming. Almost the only studies of actual farmers using an objective approach have been those by Kuder (17) and Strong (23) in preparing the scoring keys and norms for their interest tests.

Strong (23, p. 696), who succeeded in differentiating farmers from men-in-general, used 245 farmers in his work. Seventy-five percent of these were graduates of agricultural colleges with at least five years experience in actual farming. The remainder were non-college graduates with at least three years actual farming. The average age was 37.6 years and average education was 14.6 grade.

Kuder (17, p. 16) also found an interest pattern typical of farmers by using the Preference Records of 107 unidentified farmers.

Practically all of the research done with farmers has been by those in vocational education who do not have a great interest or training in objective testing. On the other hand, those most interested in standardized tests are clustered around colleges and universities, or in personnel work in industry. Consequently, the most frequently studied groups have been students or industrial workers.

Byram and Nelson (7) have done a remarkably complete job of surveying and summarizing the literature in this field. Interested persons should consult their article, as well as their source material such as the *Summaries of Studies in Agricultural Education* (24). They say:

There is a dearth of reported research into what mental abilities and what levels of mental abilities are required for successful adjustment in agricultural occupations. In spite of the importance of farming and related occupations among the vocations available to American farm youth, psychologists and research workers in guidance and education have failed to provide evidence as to the importance of various kinds of aptitudes in these occupations.

Later they go on to say:

Much of the research relating directly to students of vocational agriculture centers about interest as expressed by occupational choice and attitudes of rural youth toward farming and agriculture. Very little research has been reported on the use of psychometric measures in interests and attitudes with rural youth.

There are little objective data available on the intelligence of farmers which was gathered from army tests in the two World Wars. Byram and Nelson (7) have this to say:

Many teachers of vocational agriculture would claim that the management and operation of a modern farm require a high level of general mental ability. Yet there is little research available to substantiate their claim.

Evidence from World War I analysis of the Army Alpha indicates that the median score of farmers in the armed services in World War I was slightly below the median of all individuals tested in this scale (22).

Unfortunately, analysis for the Army General Classification Test score used in World War II does not reveal scores for "farmer" or "farm operator." The only figure available for World War II is that of the median score for "farm worker" which was at about the twenty-fifth percentile of all white enlisted men in World War II. The above figures need to be interpreted rather carefully because of the bias introduced by deferments given farm workers and operators.

Another comparison available from the World War II study is that between "high-school agricultural student," and "high school academic student." A small, but representative sample of high school students in agriculture of World War II was found to have a median score about at the median of all white enlisted men, while the median score of high school academic students was found to be about one-half standard deviation above the average of all white enlisted men (22). Moore (20) found no significant difference in the mental abilities of small samples of rural and urban boys in a small mid-western community.

Harrell and Harrell (12) in analyzing AGCT scores from 18,782 Army Air Force white enlisted men by civilian occupations found farmers to be fourth from the last in a list of 74 occupations, and farm hand to be third from the last.

A study more favorable to the IQ of farmers was done by Proctor (21) in which he tested 1,514 high school children, then thirteen years later followed up 945 of these to see what occupational adjustment they had made. His "farm managers" fell in his "Group II," or those with an average IQ of 108.

Anderson (2), in an investigation to be further discussed later, gave Otis Group Intelligence Tests to 704 boys and girls who later graduated from rural high schools. The mean IQ was

94.9, 94.2 for the boys and 95.9 for the girls. About half of these children were actually from the farm.

Probably a large part of the trouble in getting at the intelligence of farmers as a group is, as Bingham (5) says, "The range of intelligence scores among farmers is greater than in most occupational groups." The variety in the kinds, sizes, and quality of farms is so evident that it is only to be expected that there would also be great variety in the operators.

Bingham (5) concludes, "In any event, it is clear that the occupation of farmer has provided employment to a great many dull men as well as some very bright ones."

The most comprehensive investigation of farmer characteristics was an intensive study of 136 Minnesota farmers made in 1932 by Wilcox, et. al. (26) in which they used farm earning as the criterion of success.

They gathered information as to age, nativity, schooling, experience other than farming, amount of help from children, and whether farm was inherited, purchased, or rented. They gave a fifty-item trade test, checked management practices followed, and found out the rate of progress through school of the farmers' children. This last was to serve as some indication of the wide differences of native ability of the parents.

The investigators appraised subjectively the farmer's mental alertness, ambition, and interest in farming, along with the degree of cooperation he received from his wife.

Showing little relationship to earnings were: subscription to farm papers, occupational experience other than farming,

ancestral stock, schooling, children's help, environmental background or size of farm.

Definitely related to success were cooperation of the wife, children's progress through school, agricultural knowledge, mental alertness and ambition, and an interest in and liking for not only rural life in general, but for specific farm chores. Having inherited the family farm seemed to be no advantage, as those who had not inherited farms showed higher incomes. Those following more recommended practices also showed higher earnings.

In the area of interest, even very careful studies such as that of Anderson (2) have been concerned chiefly with expressed vocational choices rather than standardized tests of interest. He worked with 1,242 pupils in 36 rural high schools where the enrollment was less than 75 in 1929. He checked their expressed interests on a sheet of 20 occupational groups, along with questions about why they made their choices, seven different times throughout their high school careers. Among other things he concluded that expression in interest should be considered only one factor in determining the occupation in which success is most likely. Rural boys seemed more interested in vocations requiring physical activity--agriculture, aviation, mechanical occupations, and engineering. There was a tendency for pupils with superior intelligence to choose the professions and for children below average in native ability to prefer mechanical vocations. The opportunity to experience the essential elements of a vocation was the most important influencing factor in the development

of vocational interest. Between 25 percent and 30 percent recognized the influence of some person in their vocational choice.

At least two others have found what might be interpreted as a non-academic, or possibly non-literary, interest in farm boys. In a survey of 1,159 farm boys in Minnesota it was found by Dreier (8) that "28.8 percent of the seventh and eighth grade farm boys who want to be farmers said they did not plan to attend beyond eighth grade." Ekstrom (9) found an even higher percent from rural one-room schools. In 1946 he reported 40.4 percent and 54.2 percent of rural eighth graders in two Minnesota counties were not attending high school the following year.

Statement of the Problem

Any adequate program of vocational guidance must be based upon a substantial body of knowledge regarding the characteristics of persons engaged in a given occupation. In addition, the relationship between these characteristics and performance and satisfaction in the occupation should be determined. Such data are exceedingly rare for the occupation of farming. The major purpose of this investigation was to obtain such basic data.

Specifically, this study was designed to:

1. Determine objectively certain personal characteristics of a sample of farmers and compare the farm group with non-farm groups.
2. Determine the relationship between these measured personal characteristics and performance as a farmer.

3. Determine the relationship between these measured personal characteristics and satisfaction with farming.

In addition, this study contributes evidence regarding the relationship between performance and job satisfaction.

PROCEDURE

Subjects

The subjects of this investigation were members of Veterans On-the-Farm Training Classes of the government sponsored on-the-job training program started after World War II. Their instructors were consulted for permission to use part of their class time for the tests and for their cooperation in evaluating the farming ability of the men.

The first group, a class of 19 members, was chosen because the investigator's husband was the instructor in Highland, Kansas, a town of about 717 in the farming area of Doniphan County in the northeastern corner of Kansas. To increase the number of subjects, two other classes were recruited, the second class of 20 members at Highland and a class of 22 at Troy, Kansas, county seat of Doniphan County. Troy is 14 miles east of Highland and has a population of 977. Both towns are in the trade territory of St. Joseph, Missouri. The area is one of general farming with corn being the chief small grain, and dairy cows and hogs being the chief livestock concerns. Fifty farmers of the original total of 61 completed all the materials and comprise the group reported on here.

Characteristics

A personal data sheet including name, age, marital status, number of dependents, years of schooling, years spent on the farm, years managing his own farm, and months in the veterans class, was completed by each veteran. If married, he was asked in addition if the wife was reared on the farm and if she ever urged him to enter another line of work.

It was found that the average individual in this group was a veteran of World War II, 33.26 years of age, married and had one or two children (1.16 for total, 1.57 for married). He was reared on the farm, having spent an average of 25.58 years on the farm, and had attended school to a grade of 10.83. At the time of the investigation he had been managing his own farm for about six and a half years (6.55) and was farming 228.74 acres which he rented. Seven of the men owned their own farms and ten more owned part of their operation. He had been in the training class for about two and a half years.

Thirty-four of the 43 wives had spent more than 10 years on the farm and nine had spent less. Only four out of the 34 had encouraged their husbands to enter some other line of work, and of these three had been reared on the farm and one had not. There were seven single men in the study.

Measures of Personal Characteristics

It was desired to obtain some measure in each of the fields of aptitude, intelligence, interest, and personality. Because of

the methods to be used and the testing situation, group tests of the paper and pencil type were chosen.

The Differential Aptitude Tests, Form A, provided the aptitude data used in the study. Published in 1947, they constituted a major effort to provide a test battery with differential predictive power. Although there were eight tests in the complete battery only five were used in this study mainly due to time limitations and also because two of the tests were primarily achievement tests in the areas of spelling and language usage. The third test omitted was Clerical Speed and Accuracy.

The Verbal and Numerical tests cover materials conventionally found in tests of general intelligence. They intercorrelate beyond .7 with such measures (3, p. E-87). The Abstract Reasoning test provides a non-language measure of reasoning ability. "Space Relations" gets at the ability to visualize concrete objects and manipulate them mentally. "Mechanical Reasoning" deals with the ability to recognize everyday physical forces and principles.

The intercorrelations among these tests are sufficiently low to indicate that they are measuring different traits (3, p. C-2). They meet the usual standards of reliability. Although most of the validation studies to date have used school grades as criteria, there are a few studies which indicate their occupational validity. Their positive intercorrelations with older tests which do have extensive occupational validations give added confidence to their use.

The measure of vocational interest selected was the Kuder Preference Record, Form C. It assesses interests in ten areas labeled Outdoor, Mechanical, Computational, Scientific, Persuasive, Artistic, Literary, Musical, Social Service, and Clerical.

A variety of reliability data collected by the test author indicates that the inventory meets accepted standards (17, p. 20). The major line of evidence for the validity of the inventory consists of mean score profiles for persons engaged in specific occupations (17, p. 13-18). These data indicate that persons in different occupational groups are distinguished from persons in general and from each other by their average scores on the Preference Record. Three studies find some relationship between Kuder scores and measures of job satisfaction.

The most useful personality measure for the purposes of this study was the Minnesota Multiphasic Personality Inventory. It was designed to provide scores on a number of the more important phases of personality from the point of view of a clinical or personnel worker who "wishes to assay those traits that are commonly characteristic of disabling psychological abnormality (13, p. 5)." The Group Form, containing 566 items, was used in this study.

Four scales provide checks upon the validity of the answers given by each subject. The Question (?) score is the number of items in the "Cannot say" category. A high score means that the subject's score probably would have deviated more from the average if he had answered all the items. The Lie (L) score attempts to

identify the subject who deliberately falsifies his answers to make himself appear in a more favorable light. The F score checks the validity of the whole test record. If it is high the other scales are likely to be invalid either because the subject was careless or unable to comprehend the items, or because of errors in scoring. The K score is used as a correction factor to sharpen the discriminatory power of the variables. It is described as a measure of test-taking attitude and seems to represent defensiveness against psychological weakness (13, p. 18).

The last ten scales are measures of various aspects of personality. The Hypochondriasis scale (Hs) measures the amount of abnormal concern about bodily functions--worries over health, aches and pains with no organic basis and the like. The Depression scale (D) differentiates the optimists from the pessimists. A high score characterizes those who show a lack of self-confidence and a tendency to worry. The Hysteria scale (Hy) shows up those who are immature emotionally and are likely to get some specific complaint such as paralysis, intestinal ailments, or cardiac symptoms when facing a problem they cannot solve or can solve only by developing a symptom.

A high score on the Psychopathic Deviate Scale (Pd) indicates the kind of person who is incapable of deep emotional response, unable to profit by experience, and careless of the social mores. A high Masculinity-Femininity score indicates a deviation of the individual's basic interest pattern in the direction of the opposite sex. Persons high on the Paranoia (Pa) scale are likely

to be overly sensitive, suspicious, or have delusions of persecution. A high score on the Psychasthenia scale (Pt) indicates those troubled with obsessive-compulsive behavior or phobias. Minor symptoms include unreasonable fear of snakes or spiders, feeling compelled to return to check a locked door, excessive hand washing, vacillation, or inability to escape useless thinking.

The Schizophrenia scale (Sc) compares the individual's responses to those who have withdrawn from the world of reality and have bizarre and unusual thoughts or behavior. The Hypomania scale (Ma) points out the person with marked overproductivity of thought and action. He may try to undertake too many things at once, seem overactive and overly enthusiastic. Sometimes, however, they may swing in the opposite direction and be depressed. The Social I. E. scale (Si) measures the tendency to withdraw from social contacts, or introversion-extroversion tendencies.

More specific information as to validity and reliability are found in the MMPI Manual and in the references cited there (13).

Criterion Measures

An Index of Job Satisfaction. As a criterion for satisfaction with the job of farming the Index of Job Satisfaction devised by Brayfield and Rothe was used (6). Its reliability was checked by computing the odd-even product moment reliability coefficient obtained from the scores of 234 women office workers. The result of .77 became .87 when corrected by the Spearman-Brown

formula. The corrected split-half reliability coefficient was .60; if the three subjects with the most inconsistent responses were eliminated the reliability coefficient would become .77. It was found incidentally that the magnitude of the correlations was not appreciably different if the correlations in this study were computed on the basis of 50 subjects or 47 subjects.

Validity was checked originally by giving the test to 91 class members enrolled in a night course of Personnel Psychology. Those with personnel connected jobs were considered more satisfied than those with non-personnel jobs. The results did successfully differentiate these two groups by their scores on the Job Satisfaction Questionnaire (6, p. 310).

Instructors Rating of Success. It was difficult to decide just what would constitute a good criterion of success in a job so varied as farming. Information as to the annual net income of each farmer was available from class records and was considered as a possible criterion. After obtaining these amounts it was decided not to use them for several reasons. Because of a ruling that any veteran making over a certain net income per year would have his subsistence allowance cut proportionately, it was felt that this might act to make the reported incomes inaccurate in some cases. Another reason was that income is greatly affected by the size of the farm, and it was not wished to penalize any individual because of his having a basically smaller operation. Also, the figure that is reported as net income is arrived at in such a way that the amount spent for living expenses does not figure in the total as it would in other occupations. The great

variation in the amount spent for living expenses from family to family would cause the income figure to be misleading.

Another criterion of success which was considered was to have the members of the classes rate each other as to success. At first, they were asked to choose the three they considered the best all-around farmers in the class and the three they considered least good. This they were unable to do. Then they were asked if they could not at least name the three they considered the best. One or two began to write reluctantly, but most of them did not even attempt to write anything. They pleaded that they could not do it, so this plan was abandoned.

Finally, the instructors were asked to rate their class members at the beginning of the testing. They were to first write the member they considered the "best all-around farmer" then at the bottom place the one they considered the "poorest" or "least good," then the second best, the next to last, the third best, the third from last, and so on until all class members were rated.

From two to six months later they were again asked to repeat this rating. They did not know at the time of the original rating that they would be asked to re-rate the members of their classes. In order to combine the ratings for the three classes the rank-order rating for each class were transmuted into normal curve "scores" by means of a table originally prepared by Clark Hull for a similar purpose (11, p. 171-176). After the order of merit ratings were transmuted into scores a single distribution was made for the entire sample of fifty farmers.

The re-ratings were correlated, after transmutation, with the original ratings to provide a test of reliability. The product-moment correlation coefficient was .86 which is adequate for the purpose of this study.

Method of Data Collection

The training classes met one evening a week from 8 to 10:30. An attempt was made to divide up the testing so that from one to one and a half hours would be required out of four class periods, with a ten minute break between tests whenever possible. Actually, the testing consumed almost two hours per period.

Very few trainees proved uncooperative. One class had only one and he tried not to appear so. The first night he turned in a blank paper, was absent the second and was excused thereafter. He evidently had a strong distaste for taking tests, which was unfortunate as his instructor considered him one of his best farmers. In another class there were two who had to be omitted because they helped each other with the answers. One of these turned in several unfinished papers. He seemed to have reading difficulties, and perhaps difficulty in understanding directions.

In the third class were the only really uncooperative subjects. Three of them sat together, largely influenced by one, laughing and talking aloud during the testing. They compared answers and worked out systems for answering at random. Although they handed in a complete set of tests, they were omitted from the study. Others omitted were those who were

absent one or more of the testing nights and for whom, therefore, the set of scores was incomplete.

After all the group testing was completed there were still only 42 trainees with a complete set of scores. In order to obtain a total of 50 subjects the necessary remaining tests were given in their homes to eight more who had missed only one or two tests.

In giving the tests standard instructions were followed as nearly as possible. Group tests were given in relatively new Vocational Agriculture classrooms with fluorescent lighting. While the light would be called good it was not meant for prolonged close work at night. The men themselves apparently were not used to much concentrated reading or writing, and before the end of each test period many would be rubbing their eyes, fidgeting, stretching, and complaining of being tired.

They were also somewhat crowded having to sit at "every" place rather than "every-other" place. They had good tables and chairs except for a few who sat in old-fashioned arm-style desks. Several seemed to have reading difficulties, as shown by slowness in finishing, errors which seemed to come from reading, and eyestrain.

Testing conditions were very uniform among the three classes.

One further consideration regarding testing procedures should be noted. All the materials, including the Job Satisfaction Questionnaire, were signed by the subjects. Thus the possibility

exists that there might have been some distortion of responses, particularly on the personality inventory and the job satisfaction blank. The data reported in the next section relating to the K scale of the Multiphasic, in particular, tend to support the possibility that some distortion did occur. Previous studies of signed versus unsigned materials are not clear-cut in their findings, although they probably justify the generalization that there is some distortion on ego-involved materials when the subjects are identified (19 and 10).

RESULTS AND DISCUSSION

Personal Characteristics

The first phase of this investigation was the objective description of the aptitudes, interests, and personality characteristics of the farmer group and the comparison of their personal characteristics with those of relevant norm groups.

The mean scores of the 50 farmers on five sub-tests of the Differential Aptitude Test battery were compared with those for 2100 twelfth grade boys. Twelfth graders were selected as being the most appropriate since the farmer sample would probably approximate this amount of education if they had been of the same age at the time of testing. Table 1 presents this comparison.

The farm sample is significantly different from the twelfth grade sample on each of the five tests. As shown graphically in Fig. 1 the farm group is significantly below the average of the twelfth grade group on the Verbal, Numerical, Abstract, and Space

Table 1. A comparison of Differential Aptitude Test scores of farmer and norm group samples.

DAT Sub-test	: Farmers (N = 50)		: Norm group (N = 2100)		: Diff.: in : mean :	: t test
	: M	: SD	: M	: SD		
Verbal reasoning	23.4	9.5	28.5	9.9	5.1	3.7**
Numerical ability	17.2	8.4	22.6	9.8	5.4	4.4**
Abstract reasoning	22.6	10.7	31.1	10.1	8.5	5.5**
Space relations	41.5	20.2	54.6	23.6	13.1	2.2*
Mechanical reasoning	52.8	7.4	45.9	11.2	6.9	6.4**

* Significant at the 5% level.

** Significant at the 1% level.

sub-tests. This difference is particularly marked on the Abstract test. Only on the Mechanical test do the farmers demonstrate superiority.

As compared to twelfth grade students, then, the picture of the farm sample is one of mediocrity with one exception. It might be suggested that this inferior measured status is due in part to the "test-wisness" of the younger in-school norm group on the more academic factors. Further, the superior performance of the farmers on the Mechanical test might be due to their greater experience and familiarity with mechanical objects and their uses.

However, the Abstract and Space tests also might be considered to be somewhat free of academic influences, yet the farmers were low on these as well as the more academic Verbal and Numerical tests. Actually, of course, the data do not lend themselves to

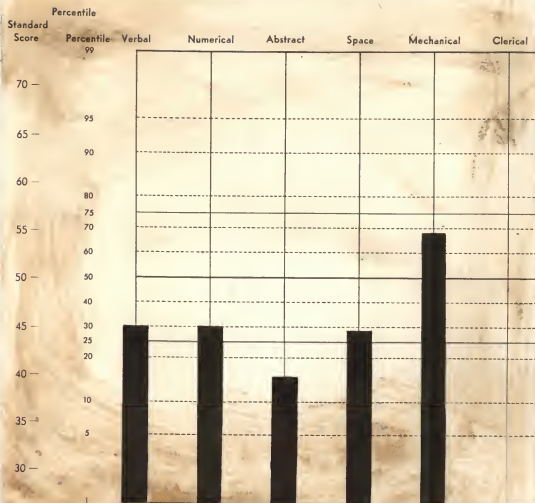


Fig. 1. Profile of the mean scores of 50 farmers on the Differential Aptitude Tests.

any definitive resolution of these possible interpretations. In any event, the findings are suggestive for vocational guidance purposes.

The comparisons on the Kuder Preference Record, the interest measure are shown in Table 2 and Fig. 2. The norm group chosen is described in the Kuder Manual (17, p. 20) as ". . . a group of 1,000 telephone subscribers who responded to the invitation to

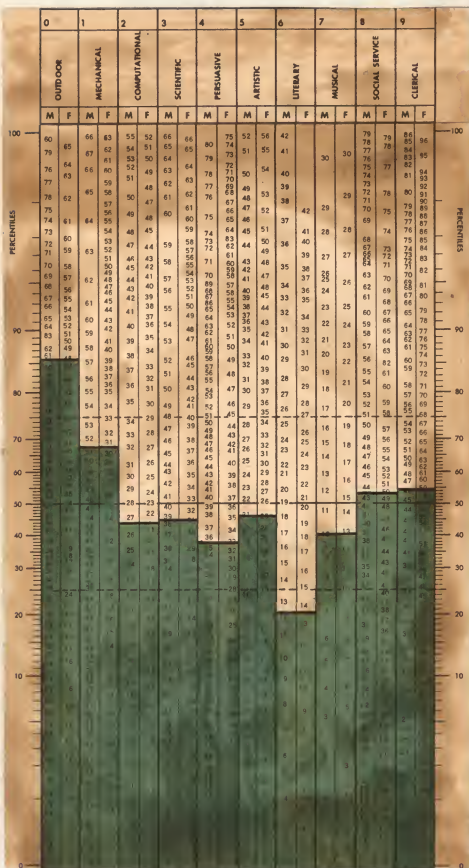


Table 2. A comparison of Kuder Preference Record scores of farmer and norm group samples.

Scale	Farmers (N = 50)		Norm group (N = 1000)		Diff. in means	t test
	M	SD	M	SD		
0 Outdoor	60.80	7.73	43.45	14.91	17.35	14.55**
1 Mechanical	51.36	8.54	43.60	12.87	7.76	6.03**
2 Computational	26.86	6.32	28.31	8.73	1.45	1.54
3 Scientific	38.76	6.78	39.98	10.44	1.22	1.19
4 Persuasive	35.58	7.88	41.13	14.61	5.55	4.56**
5 Artistic	21.00	6.26	22.85	9.06	1.85	1.97*
6 Literary	12.30	4.69	19.62	8.14	7.24	10.09**
7 Musical	10.10	6.00	12.38	6.49	2.28	2.12*
8 Social Service	43.74	10.63	41.96	12.75	1.78	1.13
9 Clerical	46.26	9.21	46.04	12.71	.22	.16

* Significant at the 5% level.

** Significant at the 1% level.

fill out the preference record. These subscribers were in a stratified sample of 138 cities and towns selected from the Postal Guide. They were chosen from all sections of the country." A break-down by Census Bureau classifications showed 18 Farmers and Farm Managers and two Farm Laborers and Foremen. These data for the male norm group were furnished in a personal communication by Dr. G. Frederic Kuder as the most appropriate norms which he had available.

The farm sample made significantly higher scores than the norm group on the Outdoor and Mechanical scales and significantly lower scores on the Persuasive and Literary scales. By inspection

of Fig. 2 it is readily apparent that the most outstanding characteristics of the farmer sample interest profile were the markedly high Outdoor interests and the lack of interest in Literary activities. Incidentally, this outstanding Outdoor interest is also characteristic of the sample of 107 farmers cited in the Kuder Manual (17, p. 16). The other findings, however, are not supported by the data of this second farm group since the remaining scales are at or near the fiftieth percentile. The farmers in this investigation do have a characteristic interest pattern which should be useful for guidance purposes.

For the Minnesota Multiphasic Personality Inventory the comparison norm group is composed of adult male visitors to the University of Minnesota hospitals who were chosen to represent a cross-section of the Minnesota population (13, p. 6). The results for this comparison are given in Table 3 and Fig. 3.

The farmer sample scored significantly higher than the norm group on one validating scale, K, and three regular scales, Hysteria, Psychopathic Deviate, and Masculinity-Femininity. However, reference to Fig. 3 indicates that these deviations, although statistically significant, were still within the range customarily considered normal in interpreting the Multiphasic. Consequently, the investigator prefers not to speculate about the significance of these findings.

In summary, it was found that the farmers in this sample do have a distinctive pattern of aptitudes and interests which provide useful information for counseling purposes. The personality inventory data seems of limited usefulness.

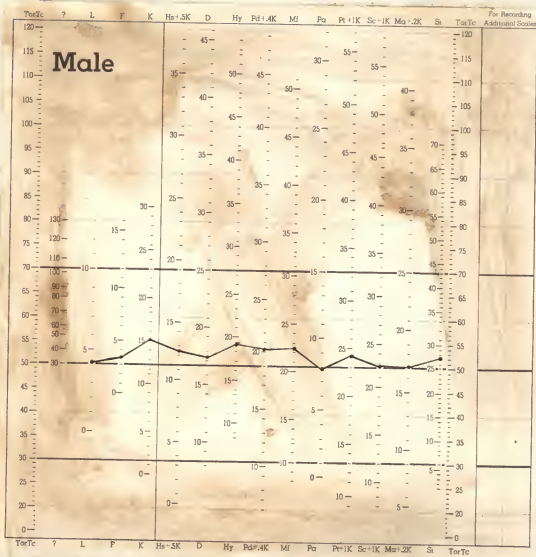


Fig. 3. Profile of the mean scores of 50 farmers on the Minnesota Multiphasic Personality Inventory.

Table 3. A comparison of Minnesota Multiphasic Personality Inventory scores of farmer and norm group samples.

Sub-test	Farmers			Norm group			Diff.		
	N	M	SD	N	M	SD	in	means	t test
L	50	4.16	1.98	294	4.05	2.88	.10		.33
F	50	3.56	4.98	111	3.88	4.24	.32		.39
K	50	15.08	2.51	247	12.84	5.64	2.24		4.41**
Hypochondriasis	50	12.48	3.34	274	11.34	3.90	1.14		1.29
Depression	50	17.34	3.45	294	16.63	4.18	.71		1.29
Hysteria	50	18.88	4.67	345	16.49	5.51	1.39		3.27**
Psychopathic Deviate	50	20.34	3.89	274	18.86	4.25	1.48		2.42*
Mf Interest	50	22.40	4.10	117	20.44	5.13	1.96		2.60**
Paranoia	50	7.92	2.37	293	8.06	3.56	.14		.35
Psychasthenia	50	24.18	4.53	274	22.95	4.88	1.23		1.73
Schizophrenia	50	22.48	4.26	274	22.26	5.21	.22		.32
Hypomania	50	17.08	3.15	274	16.83	3.99	.25		.28
Social I. E.***	50	27.14	7.95	---	---	---	---	---	---

* Significant at the 5% level.

** Significant at the 1% level.

*** Means and standard deviations for the norm group on Social I. E. were not available.

Personal Characteristics and Performance

A second step in this investigation was to determine the relationships, if any, of measured personal characteristics to performance as indicated by instructors' ratings. The resulting product-moment correlations are given in Table 4.

All the obtained relationships between aptitudes and performance are low and positive. However, only one, Numerical vs. performance, is statistically significant.

Among the interest measures, the Scientific scale is significantly correlated with performance ratings. Since positive relationships between interest and performance were only infrequently found this result is of particular significance. It appears to lend weight to the frequent assertion that modern farming is a scientific enterprise. Since the Numerical aptitude test may be considered a test of quantitative ability the picture of a scientific farmer gains credence.

There were no significant obtained relationships between performance and the personality variables measured by the Multiphasic.

In summary, two significant relationships, between aptitude and performance and interest and performance, support the description of farming as a scientific occupation.

Personal Characteristics and Job Satisfaction

The third step in this investigation was to determine the relationships, if any, of measured personal characteristics to

Table 4. Correlation between measured personal characteristics and performance rating of 50 farmers.

Sub-test	: Performance rating
<u>A. Differential Aptitude Tests</u>	
Verbal reasoning	.19
Numerical ability	.36**
Abstract reasoning	.23
Space relations	.21
Mechanical reasoning	.22
<u>B. Kuder Preference Record</u>	
0 Outdoor	.05
1 Mechanical	.22
2 Computational	-.03
3 Scientific	.40**
4 Persuasive	-.19
5 Artistic	-.06
6 Literary	-.08
7 Musical	.08
8 Social Service	-.10
9 Clerical	-.08

Table 4. (continued)

Sub-test	: Performance rating
<u>C. Minnesota Multiphasic Personality Inventory</u>	
L	.07
F	-.17
K	-.02
Hypochondriasis	-.03
Depression	-.20
Hysteria	.07
Psychopathic Deviate	-.19
Masculinity-Femininity	-.18
Paranoia	.14
Psychasthenia	.12
Schizophrenia	-.03
Hypomania	.02
Social I. E.	.20

* Significant at the 5% level.

** Significant at the 1% level.

job satisfaction as measured by the Brayfield-Rothe Job Satisfaction Blank. The resulting product-moment correlations are given in Table 5.

There were no significant obtained relationships between aptitude and job satisfaction. This is in line with the few previous studies by other investigators (25). This is one of the significant contributions of this study, since there is so little evidence bearing upon this problem.

Literary interests were found to be significantly, although inversely, related to job satisfaction. The magnitude of the relationship is low. It is of some interest that the Scientific scale is positively correlated with satisfaction, but the relationship is not statistically significant.

Perhaps the most interesting results of the entire investigation are to be found in the correlations between measured personality characteristics and job satisfaction. Four scales on the Multiphasic are significantly related to job satisfaction. Both Depression and Social Introversion-Extroversion are negatively related to satisfaction. This is interpreted to mean that those persons whose outlook on life is dark and gloomy and who show signs of social introversion tend to be among the dissatisfied persons among these farmers.

Slightly higher and positive correlations were found between two of the validating keys, Lie and K, and job satisfaction. This is interpreted to mean that persons who try to put themselves in a good light in answering the Multiphasic questions and who

Table 5. Correlation between measured personal characteristics and job satisfaction scores for 50 farmers.

Sub-test	: Job satisfaction
<u>A. Differential Aptitude Tests</u>	
Verbal reasoning	.00
Numerical ability	.05
Abstract reasoning	-.06
Space relations	-.09
Mechanical reasoning	.16
<u>B. Kuder Preference Record</u>	
0 Outdoor	.13
1 Mechanical	-.02
2 Computational	-.10
3 Scientific	.22
4 Persuasive	-.22
5 Artistic	-.10
6 Literary	-.28*
7 Musical	-.11
8 Social Service	.16
9 Clerical	-.16

Table 5. (continued)

Sub-test	Job satisfaction
C. <u>Minnesota Multiphasic Personality Inventory</u>	
L	.37**
F	-.13
K	.35**
Hypochondriasis	-.04
Depression	-.33**
Hysteria	.00
Psychopathic Deviate	.05
Masculinity-Femininity	-.18
Paranoia	.03
Psychasthenia	-.22
Schizophrenia	-.10
Hypomania	.04
Social I. E.	-.28*

* Significant at the 5% level.

** Significant at the 1% level.

respond to the items in a defensive manner also tend to be the ones in this sample who express satisfaction with their jobs. Thus a test-taking attitude may have influenced responses to the job satisfaction blank.

Among the members of this farmer sample the correlates of low job satisfaction appear to be an optimistic outlook, social extroversion, a lack of literary interests, and a test-taking attitude perhaps best characterized as "putting your best foot forward." The converse is true of those low on satisfaction.

Performance and Job Satisfaction

It was of some interest in this study to investigate the relationship existing between performance and job satisfaction since there has been much discussion but little empirical evidence regarding the relationship.

Within this farmer sample the two variables were correlated .12 which is not statistically significant. This seems to justify the statement that performance and job satisfaction are unrelated among the members of this particular sample. That is, those farmers rated as the most proficient are not necessarily the most satisfied. The converse also holds; the most satisfied are not necessarily the most proficient.

SUMMARY AND CONCLUSIONS

In an effort to determine the personal characteristics of a group of farmers, and the relationship of these characteristics

to job satisfaction and success, three Veterans on-the-farm training classes were given standardized tests in the areas of aptitudes, interests, and personality. Testing was done during the regular, weekly, evening class periods.

Aptitude tests given were five of the Differential Aptitude Test battery, Verbal Reasoning, Numerical Ability, Abstract Reasoning, Space Relations, and Mechanical Reasoning. Interests were tested with the Kuder Preference Record, Form C. The Minnesota Multiphasic Personality Inventory was used for the personality test.

In addition each veteran provided information regarding his marital status, schooling, farming experience, and other personal information.

As the criterion of satisfaction with farming the Job Satisfaction Questionnaire of Brayfield and Rothe was used. For success or performance the class instructors rated the class members from best to poorest. The ratings from each class were combined to give each farmer a standard rating score. Re-ratings gave a satisfactory reliability estimate.

These war-veteran farmers averaged about 33 years of age, were mostly married and had one or two children. They had been reared on the farm, as had most of their wives, and had attended school to an average of nearly the 11th grade. Most of them rented their farms, which averaged over 200 acres.

On the standardized tests, this group of 50 farmers was found to have several definite characteristics that would differentiate them from the norm groups.

On the DAT they were significantly lower on Verbal Reasoning, Numerical Ability, Abstract Reasoning and Space Relations. The difference was more pronounced on Abstract Reasoning. They were significantly higher on the Mechanical Reasoning test.

They showed a high Outdoor interest on the Kuder and also were significantly higher than the male norm group on the Mechanical scale. They showed a pronounced lack of Literary interest and a significant although not so noticeable lack of Persuasive interest. Low Artistic and Musical interests were significant only at the 5 percent level.

Besides significant elevations on the MMPI for Hysteria and Masculinity-Femininity scales and a slight elevation of Psychopathic Deviate, there was an elevation of the validity scale K which was significant at the 1 percent level. Some previous research has shown a relationship between K and Hysteria (18). In view of the usual stereotype of "farmer" as a "he-man," it was interesting to note the trend toward femininity. The high K was taken to mean that the men wished to appear in a good light, and it was assumed that this attitude may have carried over to the other tests and the job satisfaction blank.

In relating the test scores to the instructors' rating of performance only a few were found to be correlated to any degree. Although it can be seen that aptitudes are slightly more correlated with performance than the other measures, only one of these was significant, Numerical Ability. The only interest scale significantly related to success as measured was the Scientific, although

Mechanical approached significance. The scores on the Multiphasic showed no significant relationship with farming success as rated by the instructors.

Aptitude test scores were unrelated to satisfaction. When job satisfaction was related to the test scores Literary interest was correlated significantly but negatively. There were no other significant relationships between interest and satisfaction.

The personality test results revealed some interesting and significant relationships with job satisfaction. L and K were positively correlated, while Depression and Social I. E. were negatively correlated. It may be concluded that those who have a cheerful outlook and an extroverted personality tend to be more satisfied with farming, and that a desire to "put the best foot forward" also made them seem more satisfied.

There was no significant relationship between the job satisfaction scores and the instructors rating of success. In short, those most successful are not necessarily the most satisfied.

In conclusion, it might be said that farmers in this group seemed to have definite characteristics which might be used in counseling prospective farmers. The information that will help in predicting success or failure and that for predicting satisfaction is not so definite, but might be used with caution.

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RELATIONSHIP OF APTITUDE, INTEREST, AND PERSONALITY TEST
SCORES TO PERFORMANCE AND JOB SATISFACTION
AMONG FIFTY FARMERS

by

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