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An Investigation of the Influence of Occupations on the Loyola Language Study

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**AN INVESTIGATION OF THE INFLUENCE
OF OCCUPATIONS ON THE LOYOLA
LANGUAGE STUDY**

by

Frank A. Dinello

**A Thesis Submitted to the Faculty of the Graduate School
of Loyola University in Partial Fulfillment of
the Requirements for the Degree of
Master of Arts**

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1958

LIFE

Frank Anthony Dinello was born in Chicago, Illinois, May 28, 1929.

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CHAPTER I

INTRODUCTION

The Loyola Language Study is a word association test with an important modification over all similar tests of association. It gives the subject a slightly different task to perform than does the traditional Kent-Rosanoff test. Thus, instead of reacting to the stimulus words with the first word coming to mind, a subject is instructed to write the word which he thinks the greatest number of people would be most likely to put down. A mentally disturbed person would not be expected to comply with this instruction as well as the normal person, since the former is more self centered and will not be as able to judge normal thought and emotion, nor will he be able to identify with those who can think with the group. It was found in studies which will be detailed later that the test can so discriminate.

The Loyola Language Study originated and began its development at Boston State Hospital in 1953 through the efforts of Johnson, a hospital staff worker, and Snider, then a clinical intern at the hospital. Material from the Kent-Rosanoff word association test was used but with the modification mentioned above.

Several studies utilizing the test have been completed. More detail will be given to these studies in the following chapter. Briefly, however, it has been found that the variables of age, sex and education affect responses given on the Loyola Language Study to a variable and sometimes significant degree. Also, it has been found that the Loyola Language Study differentiates between hospitalized mental patients and normals. The patients score significantly lower than the normals on communality of thought (7).

Since the Loyola Language Study is still in the process of development and validation, the present study is aimed at acquiring a further knowledge of the degree of potency of the original idea of testing communality of thought. Also it is intended to test the hypothesis that even within the range of normal subjects, significant differences will be evident in age and education and while holding these constant also in other personality dynamics. An attempt will be made to discover whether or not the Loyola Language Study will differentiate between the personalities of widely divergent occupational categories and, if so, in what way and to what extent. It might be suspected that, since age and educational differences are known to exist, there would also be differences in the associative processes measured by the Loyola Language Study between occupational groups.

Some people seek, and are happiest in, positions which offer

very little imperative interaction with those around them in the course of their work. Accountants or some types of clerical workers might fit this category. Some other people, however, seek and are happiest in positions which of necessity involve a great deal of important interaction with others. Salesmen, industrial relations men or psychologists might fit this category. What is not fully known seems to be whether people with certain types of personalities enter fields which encourage, nourish and maintain those types of personalities, or if certain types of work encourage and develop personalities in a certain direction.

The Loyola Language Study is expected, in some unknown degree, to measure communality of thought. The question is, then, will people who seek and enter positions which minimize interaction with others make significantly different scores than do people who utilize interpersonal relations to a great extent in their jobs? Does this test measure communality of thought on a continuum even within the normal range, or does the test serve only to distinguish the normal personality from the abnormal?

Specifically, an attempt will be made through the use of fifty pairs matched for age and education to discover whether or not the Loyola Language Study will differentiate between widely divergent occupational categories.

It is hoped that this study will suggest answers to several other questions and also will serve toward adding to the knowledge

which already exists on the Loyola Language Study concerning its various applications.

THE LINGUISTIC ANALYSIS OF THE LINGUISTIC INSTRUMENT

The first purpose of this study is to analyze the linguistic instrument used in the Loyola Language Study. An attempt is indirect to determine the nature of the instrument and the number of subjects who used it. The instrument is a direction which was used in the Loyola Language Study. A similar investigation was conducted in 1957. This is a similar research instrument, which was used in the Loyola Language Study and other projects of the Loyola Language Study.

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CHAPTER II

REVIEW OF THE RELATED LITERATURE

It is the purpose of the present chapter to review the literature on word association tests having any direct or indirect bearing on the present study. It is important to know whether or not this study substantiates other work or suggests new directions which thought on the subject may take. A similar investigation has not been conducted with this particular research instrument. However, several studies on the Loyola Language Study and other forms of the word association test bear on it.

For example, Malamud used the Maller controlled association test in which two responses follow each stimulus word, one of which is "normal", the other "abnormal" (9). The subject is instructed to choose the response word which he most closely associates with the stimulus word. Malamud administered the test to 150 mental patients and to 150 normal individuals. The result of a critical ratio analysis between these two groups revealed a highly significant difference ($t = 4.90$). So the test, used as an indirect measure of emotionalized response patterns, was found to differentiate between psychiatric patients and a comparable

group of normals.

Malamud feels that the test possesses sufficient validity and reliability as a screening test to warrant continued study. He states that association tests may be found useful for a variety of factors among which are included both the clinical and industrial fields. It is suggested, for instance, that a single administration of such a test would produce a useful picture of an individual without the necessity of forcing him to risk revealing himself directly. It is further suggested that it may become possible to compare successful and unsuccessful workers in occupations where particular personality traits, values or interests are important requisites and might even yield additional scoring keys useful in the selection of employees.

Crown modified the test as described above to the extent of selecting fifty of the most discriminating items, and making the test self-administered and easier to score (5). The sample included 200 neurotics, thirty of whom were women, 100 workers in industrial fields and 100 friends and relatives of students. The difference between the normal and neurotic groups was highly significant ($t = 6.97$).

During 1952 Crown published further work on this test (6). He had collected data on over 3,000 normal and abnormal persons using a controlled word association test and was able to establish extensive norms and validation data for his test. Evidence was

presented to show that the test differentiates significantly between normal and neurotic groups. More important for the present study, however, are the following facts:

1. Crown found that there are statistically significant differences shown between diverse occupational groupings. As an example, using four occupational groups we find industrial-unskilled workers with a mean score of 13.9, industrial-supervisors at 10.7, student teachers 7.4, and professionals (hospital staff) 6.8. The correlations reported suggest that intelligence differences play only a small part. These differences, however, are difficult to interpret because of the many factors not held constant, i.e., intelligence, sex, age and education. It should be ascertained what part these factors play in bringing about the significant differences.

2. The test has also been found to have possible uses in the improvement of the selection of medical students and as part of a battery of tests for the selection of nurses (6).

Crown states further that the Word Connexion List may have considerable theoretical value in correlated studies, in testing specific hypotheses as to group differences in neuroticism, and for matching purposes.

Also in this report of twenty-eight independent investigations, Crown referred to the possible influence of education on the Word Connexion List test scores. Although the main impression

from many investigators was that abnormal groups tended to score higher than normal groups, there was considerable overlap among all groups reported. Crown hypothesized that variations in normal mean scores ranging from 6.8 to 13.9 may have been due to differences in intelligence. However, he also suggested that socioeconomic status or educational level rather than intelligence might have been a possible explanation for the differences found within the normal group. This is one of the suggestions to keep in mind on subsequent research.

Weider, Mittlemann, Brodman, Wechsler and Wolff revised an association test used by the military to screen out psychologically unfit recruits. This test, the Cornell Word Form, was developed as part of a project for screening purposes (3).

Weider et al. believed that the commonness of responses, as well as the feeling tone of the responses, reflected an individual's adjustment to life situations. By analyzing 180 stimulus words from a previous study, the authors found twenty-nine words which discriminated significantly at the .01 level of confidence between a group of 100 civilian patients with personality disturbances and a normal civilian group. Fifty-one words were added to the twenty-nine for purposes of buffer items and qualitative features.

Thus, eighty stimulus words and 160 response words constituted the Cornell Word Form. The test included twenty stimulus

and twenty-four response words from the Kent-Rosanoff list. The task given to the subject was to choose the response words which reminded him most of the stimulus word. An analysis of the test scores of seventy medical students and thirty nurses yielded a test-retest reliability coefficient of .80, when the eighty words of the Cornell Word Form were administered one week apart.

In a later study Weider and Mittlemann reported the use of the Cornell Word Form in a pre-employment test battery for production workers (10). A comparison between foreman's ratings of employees and combined test scores of the Cornell Word Form and the Cornell Index yielded a critical ratio of 3.46, which was significant at least at the .01 level of confidence. Thus, the battery of tests was in accordance to a significant degree with foreman's ratings for general adequacy on the job.

As stated before, the Loyola Language Study is a test utilizing some of the material of the Kent-Rosanoff word association test but with an important modification. Work was originally started on it at Boston State Hospital, Boston, Massachusetts, in 1953 (15). Johnson, a hospital staff worker, first conceived the modification by having a subject respond to a stimulus word by answering the word most people would be likely to use. With the help of Snider, then a clinical intern, a Boston normative sample was secured. The test was copyrighted in 1954 under the title of the Loyola Language Study. The authors hypothesized

that normal individuals would be able to compare their own ideas with the ideas of other people; that is, have the ability to express group thought. It was believed that a mentally ill person would be unable to do this since he was less in touch with normal thought or feeling. As a result the abnormal individual tended to respond in a highly individualized manner. Thus, the authors believed that by comparing an individual's performance to group norms something significant could be obtained about that person's awareness of, and conformity to, communality of thought.

The important modification introduced into the Loyola Language Study consists of the instructions, which require the subject to respond to each stimulus word, not with his first association, but with the one word which he believes most other people would give. Although as Stanek (16) states, these instructions impose some limitation on the subject and are, therefore, of a semi-controlled nature, they still allow for a variety of response. The Loyola Language Study would seem to encourage greater reflection before responding in comparison to the free association method and may be more meaningful when interpreting results.

In the Boston study mentioned previously, Johnson and Snider distributed copies of the test to hospital personnel and others. In this way a sample of 2,000 copies of the test was collected. From this number a stratified random sample which controlled age,

sex and education was assembled. The test records of 400 males and 400 females were used as the normative population. At a later date the test was individually administered to seventy-eight female psychotic patients at Boston State Hospital.

All responses to every stimulus word were tallied and assigned a derived score. This set of responses and score values served as the norms for scoring the test records of 400 males, the 400 females and the seventy-eight psychotic females. Since lower score values represented higher frequency responses, a lower total score revealed closer conformity to more common responses. A higher score indicated a less common or more individualized response. In terms of the hypothesis of the Loyola Language Study the lower score reflected normal adjustment and the higher score a less normal trend.

The study done with the Boston data, a comparison between 399 normal women and seventy-eight psychotic women, revealed that the test scores discriminated sharply and to a highly significant degree between the two groups.

In 1956 Stanek completed a dissertation in which he studied the influence of age, sex and education on the Loyola Language Study on a midwestern sample comparable to the Boston sample. He asked the question, "Are separate norms necessary for different sexes, ages and educational levels?". The results of this study reveal that age, sex and education variously affect responses

given on the Loyola Language Study to a significant degree.

Stanek states that, although the correlations were low, they were significant and revealed that age had an inverse relationship and education a constant relationship to test scores. Those conclusions from Stanek which are relevant to the design of the present study include the following:

1. The group characteristics of age, sex and education significantly affect communality of thought as measured by the Loyola Language Study, a semi-controlled association test. Since these results are based on a stratified random sample, the trends discovered may be considered representative of an adult metropolitan population.

2. Age bears an inverse relationship to Loyola Language Study test scores, i.e., the older the individual adult the less able he is to achieve communality of response and, conversely, the younger the adult the more able he is to attain communality of response.

3. Education bears a constant relationship to test scores on the Loyola Language Study. The more-educated individual is more able to give common responses.

4. Through the use of the normative tables which have been established it should be possible to investigate further applications with the knowledge that age, sex and education will have a definite but limited influence on test scores.

5. Future research regarding the effect of race, national descent, region, etc., might reveal other factors which signifi-

cantly influence performance on the Loyola Language Study. Until the effects of these factors have been determined the use of the norms developed for the Loyola Language Study should be restricted to the type of population described.

6. In view of the trouble and expense involved in labor turnover, the use of an instrument such as the Loyola Language Study which is so obviously non-intrusive and non-threatening might be found to serve personnel workers and employment officers for screening applicants. Further research in this area seems to be indicated.

Thus, there are several findings by Stanek with which it will be important to compare the present work. For instance, Stanek found, as educational level increases, communality of thought for each such level irregularly but consistently increases for the male population. The educational trends seem to reflect a gradual but definite increase of communality as more years of schooling are included.

Educational differences, although significant, were not as consistent as the three age differences (nineteen through thirty years -- young; thirty-one through forty-two -- intermediate; and forty-three through fifty-four -- old). All of the differences of the group mean scores among the age levels are statistically significant.

According to Stanek's results, then, separate norms for

different sexes, ages and educational levels are necessary.

Vincent V. Herr, S.J., has reported further on the Loyola Language Study dealing specifically with the problem of "whether the communality of the associations of hospitalized patients differed significantly from that of normals on the Loyola Language Study and whether severity of abnormality could be designated by the test (7)". The results showed significant differences between the group means, as well as reliable correlation between severity of disease and Loyola Language Study scores, of normals and psychotics. However, since there was much overlapping at the extremes, an item analysis was made on the eighty items comprising the test. It was found that twenty-five items gave significant differences at the .01 level of confidence between patients and normals. The tests were then all rescored using only these highly significant twenty-five words. The results indicated that the shortened test had a much higher screening efficiency than the longer test. (Only these twenty-five words are used in scoring the tests used in the present study).

The investigation importantly concentrates also on better attempts to quantify those observed differences. The scoring system pertinent to the present study involves standard scores. These were determined by the usual methods, after the roots of the frequencies of each response category had been determined in order to reduce the distributions of percentages. It gave an "equal

interval" scale allowing of parametric statistical computation since the responses of the normative sample were placed on a descending scale, according to the exact percentage of agreement in choosing a particular response. This standard score technique had been first applied to all eighty items before the test for item validity was done and before the twenty-five items were selected for rescoring.

In summary, the preceding review of literature has revealed several facts bearing in some way on the present study.

Malamud found significant differences between mental patients and normal individuals using the Maller controlled association test. He feels that such a test may be found useful for a variety of factors among which are included both the clinical and industrial fields even so far as comparing successful and unsuccessful workers in different occupations.

Crown found that a modified Maller controlled association test differentiates significantly between normal and neurotic groups. He also found significant differences between diverse occupational groupings.

Weider and Mittlemann used the Cornell Word Form in a pre-employment test battery for production workers and found significant differences when compared with foreman's ratings.

The Loyola Language Study was found to discriminate between 399 normal women and seventy-eight psychotic women in the Boston study.

Stanek completed a dissertation in which he studied the influence of age, sex, and education on the Loyola Language Study. He found that age, sex, and education significantly affect communality of thought as measured by this test. His results suggested that the older the individual adult the less able he is to achieve communality of response, and the younger the adult the more able he is to attain communality of response. Also the study suggested that the more-educated individual is more able to give common responses.

Finally, Vincent V. Herr, S.J., has presented a scoring system using standard scores. Also, through report of an item analysis, he found that twenty-five words in the test used together had a higher screening efficiency than the test composed of all eighty words. He also reported that the Loyola Language Study confirms the finding of significant differences between the group means of normals and psychotics, by means of three distinct systems of scoring.

CHAPTER III

A PRELIMINARY STUDY

The goal of the present chapter is to present a description of one phase of the research procedure, a preliminary study using the Chicago sample described in Stanek's dissertation (16).

The hypothesis of the final study is that widely divergent occupations tested using the Loyola Language Study will result in significantly different group scoring. To make a preliminary study of this hypothesis, a check was made of Stanek's sample of 400 males. Using the Dictionary of Occupational Titles the sample was broken down into occupational categories.

Table I presents these categories.

TABLE I
OCCUPATIONAL CATEGORIES FROM STANEK

<u>Occupation</u>	<u>Number of Loyola Language Study Tests</u>
Trade School Students	91
Professional	19
Purchasing and Sales	14
Managers	59
Clerical	36
Unskilled Laborers	23
Semi-Skilled Laborers	20
Skilled Laborers	59
Miscellaneous	79
Total	400

In order to acquire a greater sample with which to work, a consolidation was made of the preceding list putting into Group I the following three occupational groupings: Professional, Purchasing and Sales, and Managers. In Group II were placed Trade School Students, Skilled Laborers, and Semi-Skilled Laborers. The hypothesis was that in Group I were people who worked with others and had a maximum of interaction with people, while in Group II were people who worked primarily with things and who might be expected to have a minimum of interaction with other

people during the course of their work. The mean and standard deviations were computed for each group.

Table II presents the findings of a critical ratio analysis.

TABLE II

CRITICAL RATIO ANALYSIS BETWEEN MEANS FOR 91 MALES
IN GROUP I (PROFESSIONALS, ETC.) AND 172 MALES
IN GROUP II (TRADE SCHOOL STUDENTS, ETC.)

Group	N	Mean	σ	Critical Ratio	P
I (Professional, etc.)	91	471	77.50	3.35	.001
II (Trade School, etc.)	172	508.5	99.50		

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This comparison between the ninety-one normal males in a group consisting of three occupations (Professional, Purchasing and Sales, and Managers) and 172 normal males in a group of three occupations widely separated from the first group (Trade School Students, Skilled Laborers, and Unskilled Laborers) indicates the test scores discriminated to a highly significant degree between the means of the two groups.

This result seems to suggest that people in occupations with much interaction with others score lower (more communality of thought) than people who secure work in occupations which demand little interaction with others. It should be remembered, however, that this sample was not matched for age or education and, thus,

can only be considered suggestive of a trend.

It was decided to apply two correction curves (designed by Vincent V. Herr, S.J.) to the data with the intention of answering the following question: Will correction for age and education eliminate the apparent differences in the Loyola Language Study scores when comparing two diverse occupations? Correction one was constructed for age with education in groups of two years. Correction two was constructed for education with age in groups of twelve years. The sample was, thus, corrected using first one correction, then the other.

Table III presents the findings of these correction factors.

TABLE III

CRITICAL RATIO ANALYSIS BETWEEN UNCORRECTED MEANS, MEANS CORRECTED FOR AGE AND MEANS CORRECTED FOR EDUCATION, ON TWO GROUPS OF DIVERSE OCCUPATIONS

Group	N	* _a	σ	** _b	σ	*** _c	σ
Professional, etc.	91	471	77.50	468	81.00	476.5	77.00
Trade School, etc.	172	508.5	99.50	509.5	95.50	500.5	96.00
Critical Ratio		3.35		3.69		2.22	
P		.001		.001		.02	

* Uncorrected Means

** Means using Correction One (Age)

*** Means using Correction Two (Education)

Again, no final conclusions can be drawn because the sample is not matched for both education and age. However, suggestive trends might be noted. Correcting for age does not seem to reduce the significance between the group means of diverse occupations. But when the groups are corrected for education the significance between the two group means is considerably reduced. That is, these results seem to suggest that when people are of the same education they will tend to make scores closer together even in diverse occupations than if they are the same age but with education varied. So education seems to be the more effective of the two factors, age and education. However, both age and education should be matched if valid results are expected.

In order to obtain a more homogeneous group it was decided to eliminate from this same Stanek sample all ages from 31.0 to 42.11 and all grades from 9 to 12 inclusive. This elimination reduced the Group I (Professional, etc.) N from 91 to 34 and the Group II (Trade School Students, etc.) N from 172 to 42.

Table IV presents the findings of this reduced sample.

TABLE IV

CRITICAL RATIO ANALYSIS BETWEEN UNCORRECTED MEANS, MEANS CORRECTED FOR AGE, AND MEANS CORRECTED FOR EDUCATION ON TWO GROUPS OF DIVERSE OCCUPATIONS ELIMINATING AGES 31.0--42.11 AND EDUCATION 9, 10, 11, 12

Group	N	*a	σ	**b	σ	***c	σ
Professional, etc.	34	480	88	476	95.00	479	91
Trade School, etc.	42	495	100.5	502	97.50	492.5	102.5
Critical Ratio		.685		1.16		.600	
P		.50		.23		.53	

* Uncorrected Means

** Means using Correction One (Age)

*** Means using Correction Two (Education)

The results are suggestive of the fact that a group, homogeneous for age and education is occupationally less different. The trend seems to be in the direction that the closer together two groups in diverse occupations are matched for age and education, or the more homogeneous they are, the less differently they will score on the Loyola Language Study. It will be noted from Table IV that correcting for age raised the significance somewhat, but correcting for education lowered it. The same trend was noted in Table III. However, none of the differences observed in Table IV are significant.

One more study was made using isolated parts of the Stanek sample. In the whole sample, thirteen pairs matched for age and education were found. The matched pairs were chosen for the most diverse occupations obtainable in the sample.

Table V lists the occupations in the matched sample.

TABLE V

LIST OF THIRTEEN MATCHED PAIRS (FOR AGE AND EDUCATION)
EXTRACTED FROM THE STANEK SAMPLE

<u>Group I</u>	<u>Group II</u>
Salesman	Stock Hand
Machine Supervisor	Laborer
Production Control	Truck Driver
Supervisor	Hoisting Engineer
Supervisor	Leading Man
Salesman	Trade School Student
Salesman	Printer
Supervisor	Tool Maker
Supervisor	Tool and Die Maker
Production Specialist	Machine Operator
Supervisor	Tool and Die Maker
Supervisor	Relay Adjuster
Supervisor	Laborer

It is suspected that Group I would have much more interaction

with others in the course of their jobs than those workers in Group II.

Table VI presents the findings of this matched sample.

TABLE VI

CRITICAL RATIO ANALYSIS OF THIRTEEN
MATCHED PAIRS (FOR AGE & EDUCATION)
EXTRACTED FROM THE STANEK SAMPLE

Group	N	Mean	σ	Critical Ratio	P
I	13	471	87	1.103	.25
II	13	517	115		

56

It can be noted that the results are similar to those obtained on a larger sample corrected for age and education. Again it seems that the more homogeneous the normal group the less differently they score on the Loyola Language Study. It should be remembered that the samples taken from Stanek are composed of varied occupations in both groups as can be noted in Table V. An attempt will be made to eliminate this fault in the final study.

CHAPTER IV

DESIGN OF THE RESEARCH

The present chapter is concerned with the major phase of the research procedure, i.e., the method of collecting the data, the system of assigning quantitative scores to the test responses, and the statistical techniques which were applied to the data.

Two factors were considered in collecting the sample. First, the fifty pairs must be matched for age and for education. Second, the occupations within each group must be as homogenous as possible, but the groups widely diverse from each other. The hypothesis again stated is that the Loyola Language Study will differentiate between a group matched for age and education but in widely divergent occupational categories. Thus, if this hypothesis is true, people who choose a job which necessitates much interaction with other people will make significantly different scores on the Loyola Language Study than will those people who choose occupations which necessitate little interaction with others.

It was felt that Salesmen and Accountants would be favorable to the design of the study. Salesmen (Group I) would be limited

to those defined as "outside salesmen". That is, this group would not include "over-the-counter" salesmen but only those who seek out the customer. This group would be expanded to include Managers or Personnel people as typifying the sample desired.

Group II would be composed mostly of Accountants (not including Certified Public Accountants) or, if students in Accounting, at least enough advanced to be established in an accounting position. This group would be expanded to include Bookkeepers, Clerks and General Office Workers. The sample would be collected randomly until fifty tests in each group were matched for age and education.

The tests were carefully inspected before admittance to the sample in terms of the following considerations. Each test accepted had to have clear information as to age, education and nationality. National origin had to indicate that the individual was a member of the Caucasian race since no research has, as yet, been conducted with this instrument investigating racial differences.

Those tests which met the above criteria were then evaluated in terms of the test responses. Those records with eight or more responses missing were discarded. Tests were secured from such sources as Inland Steel Company, Loyola University and personal contact. A total of 153 tests were given and out of this group a sample of fifty matched pairs was secured.

Table VII presents the occupational groupings for the sample.

TABLE VII
OCCUPATIONAL GROUPINGS FOR THE PRESENT STUDY

Group I		Group II	
Salesmen	30	Accountants	38
Managers	16	Clerks	11
Personnel	4	Bookkeeper	1
Total	50	Total	50

Figure 1 presents a breakdown of the total sample according to age.

As can be noted the majority of the sample is located from ages 20--35 with a scattering of tests from 36--54. The conclusions drawn from this work must take this grouping into consideration as revealing of a matched sample largely secured from younger people.

Figure 2 presents a breakdown of the total sample according to education.

Again, as can be readily seen, the sample is skewed. It is composed almost entirely of grades 12 to 18. The lower grades, of course, are the most difficult to secure. As noted before when dealing with the ages, consideration must be given this skewness when interpreting results.



FIGURE 1

DISTRIBUTION OF TESTS IN SAMPLE ACCORDING TO AGE

Number of Tests in Sample

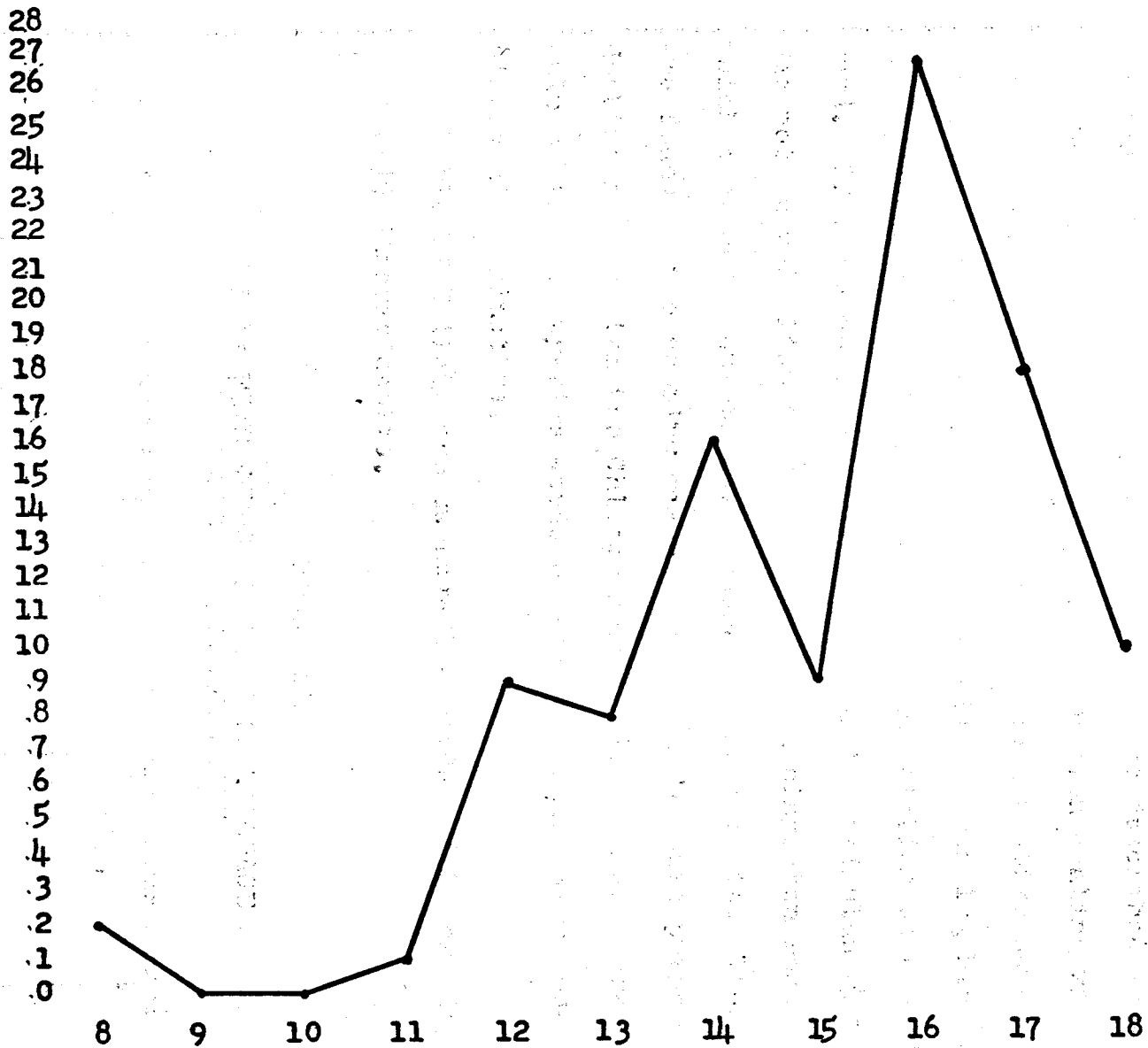
28
27
26
25
24
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20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
0

Education

8 9 10 11 12 13 14 15 16 17 18

29

FIGURE 2
DISTRIBUTION OF TESTS IN SAMPLE ACCORDING TO EDUCATION



The next part of the research procedure had to do with the calculation and assignment of quantitative scores to the test responses. The method used was the procedure described in the article by Vincent V. Herr, S.J., in the section dealing with standard scores (7). All the responses in the normative sample were assigned numerical scores quantitatively progressing higher as the response was used less frequently in relation to the stimulus word. If a response was given to any of the stimulus words which was not on this list it was regarded as a singleton response which also had a quantitative score assigned to it. These scores are found in the scoring manual published for this purpose and dealing solely with the Chicago norms (12). These scores pertain only to the twenty-five words on the test which were found to be highly discriminative.

Table VIII lists the twenty-five words which were found to be highly discriminative.

TABLE VIII

TWENTY-FIVE WORDS FROM LOYOLA LANGUAGE STUDY
USED IN PRESENT STUDY

Head	Table	Cold	Wish	Needle
Dark	Thirsty	Window	Sickness	Hand
Joy	Sweet	Scissors	Mountain	Thief
King	Stomach	Foot	Bread	Tobacco
Black	Soft	Doctor	Whistle	Butter

Finally, the total scores were added on each test and a single quantitative score was assigned. Using the standard score system means that the lower the score obtained on the test the more communality of thought was assumed.

The final phase of the work had to do with the statistical analysis of the data. Separate means and standard deviations were calculated for each group.

The primary purpose of this research as previously described was to ascertain whether or not people of diverse occupations would differ significantly on the Loyola Language Study when matched for age and education. The two major statistical techniques which were used in determining this relationship were critical ratio analysis and correlation.

Critical ratios were determined between: the means of the younger groups of the two occupations; the means between the older groups; the means of the lower educational groups of the two occupations; the means of the higher educational groups; and the means of the two intact groups (Accountants and Salesmen).

A correlation was also obtained (using the Otis method) in relation to the two intact groups.

In addition, two graphs were constructed in order to indicate pictorially any trend which could be noted. The first is a graph using the total group showing the trend in scores by increasing ages. The second is a graph using the total group showing the

trend in scores by decreasing education.

Lastly, the procedure involved the analysis and interpretation of the statistical findings and the presentation of conclusions to which they seemed to point.

CHAPTER V

ANALYSIS OF THE RESULTS

Following the research procedure outlined in the previous chapter, the test data have been statistically analyzed to determine the relationship between diverse occupations on the Loyola Language Study when the tests are matched for age and education. The findings of these statistical analyses and the interpretations based on them constitute the subject matter of the present chapter.

Each of the five critical ratio analyses computed will be discussed separately and then as a group.

The group was first divided by age. That is, a critical analysis was made between the group means of Salesmen ages 19--28 and Accountants ages 19--28.

Table IX presents the findings of this analysis.

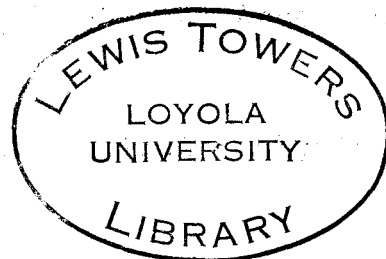


TABLE IX

CRITICAL RATIO ANALYSIS BETWEEN MEANS OF GROUP I AND II
WITH AGE RANGE FROM 19--28

	Salesmen	Accountants
M	461	479
σ	90	88
N	25	25
σ M	18.36	17.95
σ D	25.7	
CR	.70	P = .49

It will be immediately noted that the Loyola Language Study does not differentiate highly between diverse occupational categories in the younger age group when age and education are matched. Even though the significance is not high the Accountants tend to have poorer scores (i.e., the higher the score the less communality of thought).

A critical analysis was then made between the other age division, that is, between Salesmen ages 29--54 and Accountants ages 29--54.

Table X presents the findings of a critical analysis of the older group.

TABLE X

CRITICAL RATIO ANALYSIS BETWEEN MEANS OF GROUP I AND II
WITH AGE RANGE FROM 29--54

	Salesmen	Accountants
M	465	477
σ	100.5	56.5
N	25	25
σ_M	20.51	11.12
σ_D	23.3	
CR	.51	P = .63

Again there is no highly significant difference between the group means. There cannot be made as positive a statement about these findings as was possible on the younger group because of the skewness in age on the whole sample mentioned previously. There are only eight subjects between 40--49 and five between 50--54. However, again the accountants made slightly the poorer scores.

The next step was the division of the group by education. A critical analysis was made between the group means of Salesmen with education from grades eight to fourteen and Accountants with education from grades eight to fourteen.

Table XI presents the findings of this analysis on those whose education ranges from eight to fourteen.

TABLE XI
 CRITICAL RATIO ANALYSIS BETWEEN MEANS OF GROUP I AND II
 WITH EDUCATION FROM 8--14

Salesmen		Accountants
M	487	497
σ	84	120
N	16	16
σ M	22.10	31.57
σ D	38.53	
CR	.25	P = .79

The significance of differences between the means is even lower than on the age sample. It should be noted again, however, that the Accountants made poorer scores which, so far, seems to be the trend.

A critical analysis was made between the other education division; that is, between Salesmen with education ranging from grades fifteen through eighteen.

Table XII presents the findings of a critical analysis of this group.

TABLE XII

CRITICAL RATIO ANALYSIS BETWEEN MEANS OF GROUP I AND II
WITH EDUCATION FROM 15--18

	Salesmen	Accountants
M	455	460
σ	70	76.5
N	30	30
σ M	12.96	14.16
σ D	19.2	
CR	.26	P = .79

The significance of differences between the means is low, the same as on the lower education group. However, the average mean for the grades 8--14 group is 492 while the average mean for the grades 15--18 is 457. This definitely indicates that higher education, whatever the occupation, tends to aid in developing communality of thought. Once more the accountants had, very slightly, the higher group mean.

A critical analysis was now done on the total group of fifty pairs matched for age and education.

Table XIII presents the findings of this analysis.

TABLE XIII

CRITICAL RATIO ANALYSIS BETWEEN MEANS OF GROUP I AND II,
FIFTY PAIRS MATCHED FOR AGE AND EDUCATION

	Sales	Accounting
M	463	478
σ	75.15	94.60
N	50	50
σ M	10.74	13.51
σ D	17.26	
CR	.86	P = .39

It can immediately be seen that a difference this large could occur by chance almost forty percent of the time. It must be concluded then that the Loyola Language Study, using this particular sample, does not differentiate between diverse occupations.

Other trends may also be noted when considering all of the data together presented so far in this chapter.

Higher education seems to stabilize the scores. The smallest difference in the group means between the two occupations resulted from the educational levels between grades fifteen to eighteen. Although Accountants tend to be poorer (have less communality of thought) at every age and educational level, the difference diminishes as education gets higher.

As a final check on the study a correlation was computed, between the two groups. The result was $r = .01$. This substantiates the results of the critical analyses in pointing out the fact that the Loyola Language Study does not differentiate between these two occupations using this sample.

In order to present some of these findings pictorially, two graphs were constructed.

Figure 3 presents the scores of the total group with education decreasing.

It is apparent that the more highly educated group is more stable in their scores and have only slight differences between the occupations. As the education decreases the scores tend to become highly variable within the group with little regard for occupation. Education, according to these results, seems to be a steadying influence. The result of matching on certain isolated parts of the group seems to be apparent.

Figure 4 presents the scores of the total group with age increasing.

The graph indicates several trends. It seems apparent that as age increases the scores on the Loyola Language Study become more variable as they did with lower education. As the age increases the trend is toward higher scores and thus less communality of thought. Again, the results of matching on certain isolated parts of the group seem apparent.

Loyola Language Study Scores

625
600
575
550
525
500
475
450
425
400
375
350
325
300

Salesmen —
Accountants —

Education	18	17	16	15	14	13	12	11	10	9	8
# of Tests Averaged	6	7	12	5	9	4	5	1	0	0	1

FIGURE 3
MATCHED PAIRS ON LOYOLA LANGUAGE STUDY BY DECREASING EDUCATION

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E

S
T
U
D
Y

S
C
O
R
E
S

700
675
650
625
600
575
550
525
500
475
450
425
400
375
350
325
300

Salesmen ———
Accountants ———

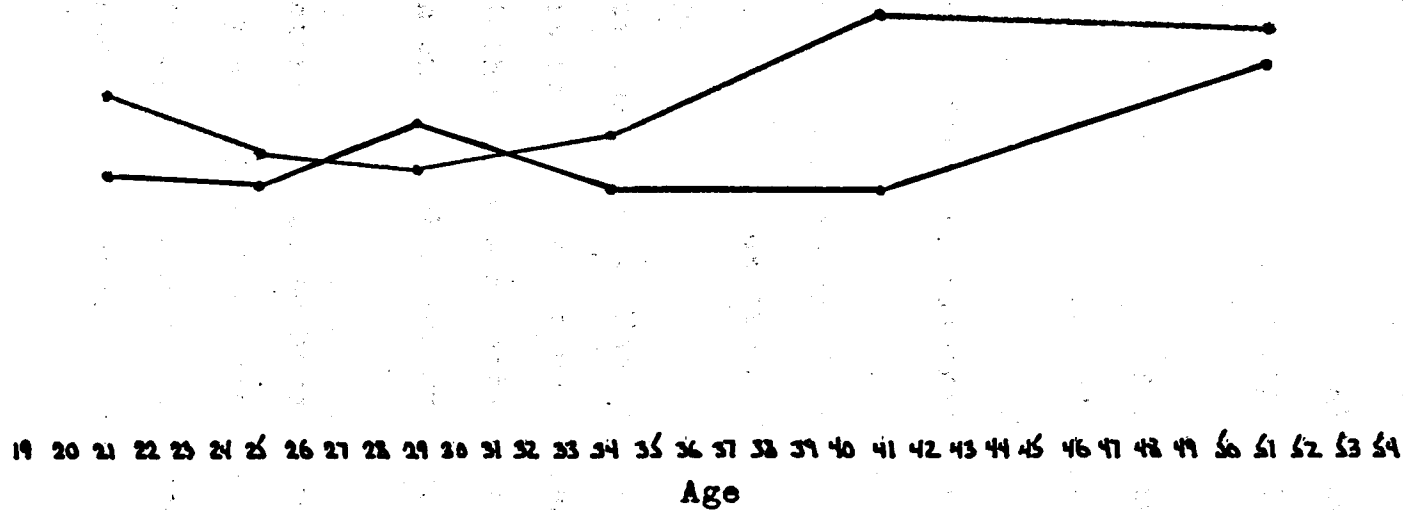


FIGURE 4

MATCHED PAIRS ON LOYOLA LANGUAGE STUDY BY INCREASING AGE

Looking at the results as a whole there seems to be agreement with several of Stanek's findings and also substantiation of the findings on a preliminary study using part of Stanek's sample.

This study agrees with Stanek on the following points:

1. The group characteristics of age and education affects communality of thought as measured by the Loyola Language Study.
2. Age has an inverse effect on responses made to the Loyola Language Study. That is, the older a group of individuals are the less able they are to achieve communality of response and, whatever the occupation, their scores are more variable than a comparably younger group.
3. Education affects the scores. The more educated a group is the more able they are to give common responses. Also, education tends to cancel out the adverse effects of advancing age. That is, education, even among higher age groups, seems to be a steadying influence.

Although the Accountants tended to have poorer scores in every age and educational grouping these differences seem not significant enough for future research to be concerned about as long as age, education and sex are controlled.

CHAPTER VI

SUMMARY AND CONCLUSIONS

The purpose of the present study has been to add to the knowledge which exists on the Loyola Language Study concerning its various applications. More specifically, an attempt has been made to discover whether or not the Loyola Language Study differentiates between widely divergent occupational categories and, if so, in what way and to what extent.

The review of literature revealed that no research had been conducted on this instrument employing this hypothesis. Studies on other word association tests raised hopes that these tests would be of use in discriminating between occupational categories and even act as an aid in choosing or rejecting people for certain occupations.

The Loyola Language Study was administered to a random sample of 153 people, out of which fifty pairs matched for age and education were extracted. The two broad occupational categories chosen were Salesmen and Accountants. Each group had two other closely related occupations included in the sample. The 2,500 responses (using only twenty-five highly discriminative words

rather than the eighty words originally comprising the test) were tallied, their frequencies converted to standard scores, and the test records scored. In the scoring system used, a lower score denoted greater communality of response and a higher score less communality of response. Means, critical ratios, and a correlation were calculated to answer the question proposed by the investigation; in addition, two graphs were prepared showing scores by decreasing education and increasing age.

The results of the statistical analyses revealed that diverse occupations had no significant effect on the Loyola Language Study. While Accountants tended to be slightly poorer at every age and educational level, the differences were small enough so that it may be suspected that future samples need not be matched for occupation but only for age, education and sex. (This study, of course, is limited to a male sample). Also, it should be taken into consideration that the sample was largely composed of younger men with above average educations.

Thus, negative findings were discovered in terms of the primary hypothesis.

Several trends were noted in the critical ratios computed and from two graphs constructed for age and education.

1. Age and education affect communality of thought as measured by the Loyola Language Study.
2. Increasing age decreases ability to give common responses.

3. Increasing education increases the ability to give common responses.

4. Higher educational groups are more able to give common responses regardless of age or occupation. So education tends to cancel out the adverse effects of advancing age.

5. It is suspected from the trends indicated in this study that future samples need be secured controlling only age, education and sex.

BIBLIOGRAPHY

A. BOOKS

- 1 Garrett, Henry E., Statistics in Psychology and Education, 3rd ed., New York, 1947.
- 2 Jung, Carl G., Studies in Word Association, translated by M. D. Eder, New York, 1919.
- 3 Weider, Arthur, Bela Mittlemann, K. Brodman, David Wechsler, and H. G. Wolff, Cornell Word Form Manual, New York, 1941.

B. ARTICLES

- 4 Carter, Harold D., "A Preliminary Study of Free Association: I. Twin Similarities and the Technique of Measurement," Journal of Psychology, V, 1938, 201-215.
- 5 Crown, Sidney, "Controlled Association Test as a Measure of Neuroticism," Journal of Personality, XVI, 1947, 198-208.
- 6 Crown, Sidney, "The Word Connexion List as a Diagnostic Test: Norms and Validation," British Journal of Psychology, General Section, XLIII, 1952, 103-112.
- 7 Herr, Vincent V., "The Loyola Language Study," Journal of Clinical Psychology, Vol. XIII, No. 3, 258-262, July, 1957.
- 8 Karwoski, T. Francis, and F. Berthold, Jr., "Psychological Studies in Semantics, II. Reliability of Free Association Tests," Journal of Social Psychology, XX, 1944, 233-247.

- 9 Malamud, Daniel I., "The Value of the Maller Controlled Association Test as a Screening Device," Journal of Psychology, XXI, 1946, 37-43.
- 10 Weider, Arthur, Bela Mittlemann, "Personality in Psychosomatic Disturbances Among Industrial Personnel," American Journal of Orthopsychiatry, XVI, 1946, 631-639.
- 11 Whipple, G. M., "The Value of the Free Association Method in Individual Psychology," Psychological Bulletin, XIII, 1916, 292-294.

C. UNPUBLISHED MATERIALS

- 12 Loyola Language Study, Scoring Manual for Chicago Men and Women. "Z" scores for 25 items, Loyola University, Chicago.
- 13 Snider, Louis B., S.J., An Experimental Approach to Diagnosis, A Report Given at the Fall Meeting of the Chicago Society of Catholic Psychologists, Chicago, Illinois, 1954.
- 14 Snider, Louis B., S.J., Loyola Language Study, Unpublished Report, Loyola University, Chicago, Illinois, 1954.
- 15 Snider, Louis B., S.J., Progress Report on the Loyola Language Study, Unpublished Report, Loyola University, Chicago, Illinois, 1954.
- 16 Stanek, Richard J., An Investigation of the Influence of Age, Sex and Education on Responses to a Semi-Controlled Association Test, Unpublished Doctoral Dissertation, Loyola University, Chicago, Illinois, 1956.

APPROVAL SHEET

The thesis submitted by Frank A. Dinello has been read and approved by three members of the Department of Psychology.

The final copies have been examined by the director of the thesis and the signature which appears below verifies the fact that any necessary changes have been incorporated, and that the thesis is now given final approval with reference to content, form, and mechanical accuracy.

The thesis is therefore accepted in partial fulfillment of the requirements for the Degree of Master of Arts.

4/28/58

Date

V. H. H. H.

Signature of Adviser