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# Validation of a Measure of Aggression

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*Eastern Illinois University*

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**VALIDATION OF A MEASURE OF AGGRESSION**

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(TITLE)

BY

**JACK EDWARD SHOCK**

**THESIS**

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS  
FOR THE DEGREE OF

**MASTER OF ARTS**

---

IN THE GRADUATE SCHOOL, EASTERN ILLINOIS UNIVERSITY  
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**1972**  
YEAR

I HEREBY RECOMMEND THIS THESIS BE ACCEPTED AS FULFILLING  
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DEPARTMENT HEAD

BY THE

MEMBERS OF THE PSYCHOLOGY DEPARTMENT

DATE May 19, 1972

### ABSTRACT

The study attempted to validate a questionnaire as a method of measuring aggression resulting from frustration. The method consisted of correlating aggression measured by the questionnaire with aggression produced by an actual frustrating situation. An insult-failure technique was used to produce the frustration during the administration of a bogus aptitude test. Evaluation of the experimenter was the direct expression and measurement of aggression. A control group was used to insure validity of the frustration technique. Eighty six students participated in the study. The correlation was significant for males. The correlation was not significant for females. Males were not more aggressive than females in responding to either the questionnaire or the frustration.

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## INTRODUCTION

The frustration-aggression hypothesis (FAH) was introduced in the monograph Frustration and Aggression by Dollard, Doob, Miller, and Sears. (1939) They believed the FAH would bring a "degree of systematic order" into the "chaotic phenomena" called aggression. Thirty years later another author was to say,

"Now and then in the social sciences a theoretical proposition becomes a focal point of widespread controversy. Purporting to explain a host of apparently unconnected events with only a few concepts, the sweeping formulation becomes a banner around which adherents and critics rally in wordy conflict." (Berkowitz, 1969, p. 1)

"The frustration-aggression hypothesis is one of these crucial formulations." (Berkowitz, 1969, p. 2)

The importance of studying all facets of aggression can not be disputed. The Yale group (Dollard, et al., 1939) provided the first postulate upon which to base experimental investigation of aggression. Despite the controversy which surrounds the FAH, experimental investigations of it have provided us with needed information about man's aggressiveness. The present study was concerned with validating ~~one~~ of the tools which has been used to measure aggression as formulated by the FAH.

The original hypothesis consisted of two parts: the occurrence of aggressive behavior always presupposes the existence of frustration; the existence of frustration always leads to some form of aggression. Frustration was independently defined as that " . . . condition which exists when a goal-response suffers interference." (Dollard, et al., 1939, p. 4) Aggression was independently defined as an " . . . an act

whose goal-response is injury to an organism (or organism-surrogate)." (Dollard, et al., 1939, p. 4) The monograph produced immediate reaction. Because the authors felt they had been somewhat misunderstood, Neil Miller modified the group's hypothesis slightly in a 1941 publication, (Miller, 1941). He changed the second part of the hypothesis to read, "Frustration produces instigation to a number of different types of responses, one of which is an instigation to some form of aggression." (Miller, 1941). The others supported his modification, but held to the position of aggression as the primary response to frustration. Miller went on to suggest areas of investigation for future study. At that point in time, the investigations were primarily concerned with validation of the FAH. Doob and Sears (1939) studied possible substitute responses to overt expression of aggression. Later Sears (1941) reported on ways to study nonaggressive responses to frustration.

For the next few years discussion of the FAH concentrated on theoretical implications. Maslow believed the FAH did not differentiate between threat and deprivation, and said that humans use frustration to dominate others. (Maslow, 1941). Rosenzweig (1941) felt that there were two fundamental types of reaction to frustration, need persistive (a response that would fulfill the original goal-response) and ego-defensive (a response that would protect the integration of the personality). Using the Balinese culture as an example, Bateson (1941) proposed the idea of culture affecting frustration responses. Hartman (1941) discussed the application of frustration phenomena to political and social systems.

Today the emphasis is on experimental study of the psychological principles proposed in the original monograph. The psychological principles associated with the FAH consist of four groups of factors which effect the form aggression takes in response to frustration. The factors are:

- "1. Those governing the strength of instigation to aggression; i.e., the amount of frustration.
2. Those related to the inhibition of aggression; i.e. the effects of punishment.
3. Those determining the object toward which aggression is directed and the form this aggression takes; i.e. the displacement of aggression.
4. Those related to the reduction of instigation to aggression; i.e. the catharsis of aggression." (Dollard, et al., 1939, p. 27)

An excellent discussion of these principles as they are currently viewed can be found in Personality: Dynamics, Development, and Assessment. (Janis, 1969, pp. 145-171)

Early studies of the principles involved simple modifications or correlates of the FAH and usually used human subjects. Pastore (1952) found that arbitrary frustration produced more aggression than non-arbitrary frustration. Cohen (1955) expanded Pastore's work to include the factors of social norms and status of the frustrating agent. He found that persons with strong social inhibitions responded with less aggression to frustration than persons with lower inhibition. Further, he reported that arbitrary frustration increased the amount of aggression expressed and that aggression was inversely affected by the status of the frustrating agent (the higher the status of the agent, the lower the

amount of aggression expressed). Worchell studied the fourth group of factors and found that catharsis of hostility through group discussion did reduce the effects of frustration and the resulting aggression. (Worchell, 1957, 1958). Recent investigations have increased in complexity of factors studied and methods used. Allison and Hunt (1959) correlated responses to a Situational Frustration Test (consisting of items describing frustrating situations) to responses on Edwards' Social Desirability Scale. They found an inverse relationship between social desirability and the level of aggression expressed in response to frustration. Fishman (1964) correlated need for approval and frustration induced aggression. Need for approval was measured by the Marlowe-Crowne Social Desirability Scale and aggression was measured by an evaluation of the experimenter by the subjects. Blood pressure readings, TAT card responses, and a word association test were used to measure the level of arousal. She found that the higher the social desirability of a subject, the lower their expression of aggression would be. More recent studies of the FAH have generally used animals as research subjects. Most of the animal studies can be traced to Ansel's work with rats in two alley mazes (e.g. Ansel and Surridge, 1964). These studies deal with such variables as size of reward, delay and removal of reward, and nonrelief of frustration. However, their methods are not related to the present study.

When Miller published the modification of the FAH in 1941, he suggested four areas for future investigations. The first of these was concerned with the application of the hypothesis to the "integration and elucidation of clinical and social data." Twenty years later, when Yates wrote about



the measurement of aggression he said, " . . . it is an extraordinary fact very little direct experimental work has been carried out on this basic problem." (Yates, 1962, p. 97). The present study was undertaken in order to study in an experimental situation: the identification of a method of measuring aggression which is applicable in a clinical situation.

Although there are several questionnaires designed to evaluate aggression, the present study was concerned with obtaining a measure of aggression which is the result of frustration. The reader is referred to Yates (1962, p. 98) for a discussion of other types of questionnaires developed to measure aggression.

The early studies of the FAH used questionnaires as the method of measuring aggressive responses to frustration (Doob and Sears, 1939; Cohen, 1955; Pastore, 1952; and Rothaus and Worchell, 1960). In this study a questionnaire developed by Pastore (1952) was combined with four objective responses devised by Cohen (1955). If such a questionnaire can measure a person's reaction to frustration, then the clinician will have a valuable tool in assessing potential for aggression.

The purpose of the study was to determine if the questionnaire could predict the degree of aggression produced by experimental frustration. The experimental procedure consisted of frustrating subjects on a modified aptitude test. The frustration consisted of an insult-failure technique which has been widely validated (Berkowitz, 1960; Feshbach, 1955, 1961, 1965; Graham, et al., 1951; Kregerman and Worchell, 1961; McClelland and Apicella, 1945; and Worchell, 1957, 1958). The technique used in the study was identical to the technique used in the Kregerman and Worchell

study previously validated by Worchell (1957, 1958). An evaluation of the frustrating agent by the subjects served as the measure of the experimentally induced aggression (in response to frustration). (Berkowitz, 1960; Feshbach, 1955; Graham, et al., 1951; Hokanson, 1961; and Worchell, 1961).

Previous research has shown that a questionnaire can differentiate between aggressive and nonaggressive groups with a high level of significance. (Cohen, 1955; Pastore, 1952; and Rothaus and Worchell, 1960). This further suggests that the questionnaire can measure aggression in response to frustration. Therefore, the main hypothesis stated:

The correlation between aggression as measured by the questionnaire and the experimentally induced aggression will be significant.

A secondary hypothesis was concerned with sex differences in regard to level of aggression expressed in response to frustration. Most of the studies done to date have used either all male or all female subjects. Pastore (1952) and Worchell (1958) used subjects of both sexes, but reported no significant difference between them in respect to aggression. However, recent studies indicate a difference between male and female aggression. (Eron, Husemann, Lifkowitz, and Walder, 1972; Sarason, 1961; and Thompson, 1962). Therefore, the secondary hypothesis stated:

- a) Males will be more aggressive than females as measured by the questionnaire.
- b) Males will be more aggressive than females when they are frustrated.

## METHOD

Subjects were eighty six students enrolled in introductory psychology courses at Eastern Illinois University in Charleston, Illinois. Two of the classes were designated as the experimental group and the third was randomly selected as the control group. The experimental group contained thirty five females and nineteen males. The control group contained twenty two females and ten males.

The questionnaire consisted of ten items describing frustrating situations. (Pastore, 1952) The instructions on the questionnaire and an example are printed below.

"Please fill out the information at the top of the page--sex, class standing, and identification number. Your instructor will not see the results and you will be known only by number.

I would like to get information on your feelings and behavior in certain common situations. There is no correct or incorrect answer to any of the items. I am simply interested in knowing how people react. If you have never been personally involved in any of the situations, try to imagine what your responses would be. Choose your answers from the following:

I would:

- a) be angry and would show it in my behavior.
- b) be angry and not show it in my behavior.
- c) not be angry.
- d) try to do something about the situation without feeling angry.

1. You're waiting on the right corner for a bus, and the driver intentionally passes you by."

These instructions are slightly different than those used by Pastore (1952).

A complete copy of the questionnaire can be found in Appendix A.

The aptitude test given in the experimental task consisted of six subtests from The Multi-Aptitude Test published by the Psychological

Corporation. (1955) The six subtests were: checking, vocabulary, general information, arithmetic, number series, and scrambled letters. The general instructions and each of the six subtests were on separate sheets of paper. The test used is identical to the manual except that four subtests were omitted so the test could be completed in thirty minutes.

In addition to the instructions given in the manual for the Multi-Aptitude Test, the following was printed on the front page of the test.

"This is a test which has been given to a large group of college students. It has been found that this test is a fairly accurate predictor of how well people do in college. Your scores will be entered in your academic files for future references. Do as well as you can."

These instructions are taken from the Kregerman and Worchell study (1961). They are designed to produce ego involvement (Worchell, 1957). A complete copy of the test can be found in Appendix B.

### Procedure

Two preliminary studies were conducted. The first was to determine if the four objective responses were sensitive enough to produce a good distribution of scores. The questionnaire was given to forty six students from two mental hygiene classes at Eastern Illinois University. Nineteen of the students were male and twenty seven were female. The distribution which resulted was judged adequate on the basis that no significant difference was found between the means and standard deviations for the male, female, and combined scores. Out of a possible range of scores from zero to twenty, the two classes had a distribution from two to nineteen. The distributions, means, and standard deviations are printed in Appendix C.



The second study was conducted in order to establish shortened time limits for the aptitude test. These time limits were designed to be so short that most students would be unable to complete any of the subtests. The shortened time limits is a necessary part of the insult-failure technique. The test was given to fourteen students of an experimental psychology class at Eastern Illinois University. Six of the students were female and eight were male. The students received the full test with the required time limits in effect. The students were requested to write down the time they used to finish each of the subtests. From these times a standard deviation was derived for each of the subtests. Each of the time limits was reduced by one standard deviation except checking. The checking time limit was increased from one minute to two minutes. Since checking was to be the first subtest, the extra time was added so that when the test was administered to the control and experimental groups, the students would relax and lower their anxiety level. (Kregerman and Worchell, 1961) The shortened time limits were used as the failure half of the insult-failure technique for the experimental group.

Since the procedure was slightly different than previous studies, a control group was incorporated into the design. The control group was used to insure that the frustration technique was indeed frustrating. This required equivalence between the control and experimental groups on responses to the questionnaire since both were tested prior to treatment. To state that the technique did frustrate the experimental group would require a significant difference between the experimentally induced aggression responses of the control group and of the experimental group.

The subjects received the questionnaires first. The instructors of each of the classes administered the questionnaires to their students to prevent them from associating it with either the experimental task or the experimenter. To increase the separation of questionnaire and experimental task, the instructors told their students that the questionnaire was for a psychology professor in connection with research he was doing. The name of one of the professors at Eastern Illinois University was listed at the bottom of the questionnaire.

Scoring was identical to that used by Cohen (1955). A value of two was assigned to all (a) responses and a value of one was assigned to all (b) responses. The (a) responses were considered overt aggression responses, and the (b) responses were considered nonovert aggression responses. The (c) and (d) responses were considered nonaggression responses and scored zero.

The experimental task was given three days after the administration of the questionnaire. On the day of testing, the experimenter entered the room and announced that the instructor would not be present that day. He proceeded to hand out the tests without further comment. The experimenter was a graduate student in psychology and wore casual clothes, shirt and tie and slacks. After reading the general instructions, he proceeded through the test administration without stopping.

The control group worked through the test without distraction. They were allowed the full time limits recommended by the test manual. When the test was completed, the experimenter said, "Thank-you" and walked out of the room.

After the experimental group completed the checking subtest, they proceeded through the test also. However, throughout the rest of the administration, they were continuously insulted by the experimenter. He made comments such as, "skip the ones you don't know; you will be penalized for guessing; you are working too slowly; I don't understand why you can't finish each test in the allotted time; most students of your age are able to complete all of the tests within the time limits; etc." At the same time of course, they were failing the test since the time limits were too short. Thus, the students were exposed continuously to the insult-failure frustration procedure. At the end of the last subtest, the experimenter remarked to both classes that he thought they were the slowest group he had seen. He then left the room.

A psychology professor (a confederate of the experimenter) entered the room immediately after the experimenter had left. The professor informed the students that he was the experimenter's instructor for an independent study course in test administration. He asked the students to evaluate the competence of the experimenter as a test administrator on the basis of the test just concluded, using letter grades with + and - if they so desired (i.e. A+, A, A-, etc.). The professor instructed the students to put the grade at the bottom of the first page of their test. Further, the instructor stressed the fact that the experimenter would not know the grades they assigned him, and that their evaluations would be used in determining the experimenter's grade in the independent study course. After all students had written down a grade, the instructor called the experimenter back into the room. The experimenter collected the tests (after he had the students

remove their names), and explained the entire study and its purpose to the students. This was done to relieve any anxiety the students may have developed during the test. The evaluation procedure was identical for the control group and the experimental group, but the professor was not informed as to which class was the control group until all classes had given an evaluation to the experimenter. This was done to prevent bias on his part.

The evaluations were scored on the basis of a twelve point scale. An A+ was scored zero, an A was scored one, an A- was two, and so on up to F which was scored twelve. An F was considered the highest overt aggression response, and an A+ was the lowest nonaggression response.

### RESULTS

The main hypothesis was partially supported by the data. The correlation between aggression as measured by the questionnaire and the experimentally induced aggression for females was not significant, but the correlation for males was significant. Both parts of the secondary hypothesis were rejected. Males were neither more aggressive in responding to the questionnaire nor in responding to frustration than were females.

Before the results of the experimental task could be analyzed, the insult-failure technique had to be validated. This required a significant difference between the aggression scores of the control group and the aggression scores of the experimental group (in response to the experimental task). The data supported the use of the insult-failure technique; the experimental group responded significantly more aggressively to the experimental task than the control group. A Mann-Whitney U of 426.5

was computed, and the Z of -4.094 was significant ( $<.05$ ). Since the two groups were not different in responses to the questionnaire ( $Z = .96$ , N.S.,  $>.05$ ) the insult-failure technique did frustrate the experimental group. Table 1 presents the data.

TABLE 1

The Test of Significance for Control X Experimental (M & F Combined)

	U	Z	Level
Questionnaire	821.5	.96	N.S. ( $>.05$ )
Exper. Task	426.5	-4.094	S. ( $<.05$ )

Once the frustration procedure had been validated, a rho for the correlation between aggression as measured by the questionnaire and the experimentally induced aggression was computed for males and for females. The rho for females was .212 (N.S.,  $>.05$ ). The correlation for males was  $\rho = .488$  ( $<.05$ ). Table 2 presents this data.

TABLE 2

Correlations of  
Questionnaire Aggression to Experimental Aggression

	rho	T	Level
M	.488	2.298	S. ( $<.05$ )
F	.212	1.240	N.S. ( $>.05$ )

Neither part of the secondary hypothesis was supported by the data; they were both rejected. In testing the difference between females and males in response to the questionnaire, a Mann-Whitney U of 322.5 and



a Z of .36 (N.S.,  $p > .05$ ) was obtained. In response to the experimental task (frustration), the U obtained to test the difference was 331.5 with a Z of -.036 (N.S.,  $p > .05$ ). Males were not more aggressive than females in either condition. Table 3 presents this data.

TABLE 3

Test of significance for Male X Female  
(Questionnaire Responses and Frustration Responses)

	U	Z	Level
Questionnaire	332.5	.36	N.S., $p > .05$
Frustration	331.5	-.035	N.S., $p > .05$

### DISCUSSION

The results indicate that although the questionnaire can not be recommended for clinical use at this time, further research is warranted. The correlation for males was significant and indicates that the questionnaire can predict a degree of aggression under limited circumstances. The correlation for females was not significant, and no recommendation can be made.

A refinement of technique may raise the correlation for males. This can be obtained by increasing the number of items in the questionnaire. Although the ten items in this study were adequate for experimental investigation, a questionnaire that can be used in clinical settings would probably require more items since some of the items are restricted situations. For example, females may not be able to respond to item 10 (concerning denial of a promotion in the army) since they never (or seldom) face such a situation. Similarly, item 6 would not be appropriate for persons who have not pursued higher education. Therefore, improvement of the item selection on the questionnaire is highly recommended.

The insult-failure technique (as used in this study) does not need refinement. Because the technique has been so well validated, it can be applied to a variety of situations. Evidence from this study further confirmed its validity and usefulness.

The rejection of the secondary hypothesis concerning sex differences in expression of aggression presents a problem. Society accepts and encourages the concept of males being more aggressive than females. The failure of both the questionnaire and the experimental frustration to differentiate between males and females goes against this concept and thus may result in rejection of the questionnaire. Selection of subjects may have been the reason for the rejection of the hypothesis. Allison and Hunt (1959) and Fishman (1964) have proven that social desirability and need for approval inversely effect the expression of aggression. Since the subjects were all either freshmen or sophomores, their social desirability and need for approval levels were probably higher than the general population. If this were true, they would have inhibited their tendency to express aggression, and would have expressed similar levels of aggression. Another possibility is that the males were more inhibited than the females and thus had lower aggression levels than normal. There is evidence that college males are less aggressive than the general population males when measured by the MMPI (Goodstein, 1954), which supports this possibility. But since the correlation for males was significant and the correlation for females was not significant, it is possible that males verbally express a level of aggression which is closely related to the level of direct aggression they are willing to express, and that females verbally express a level of aggression which is higher than the level of direct aggression they are willing to express. Of course, the author

is not applying this theory to the general population, but rather only to populations similar to the one he tested. A study using female subjects and designed to offer both verbal and direct aggression responses to frustration would help to clarify the above discussion.



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APPENDIX A

The Questionnaire

# INFORMATION QUESTIONNAIRE

AGE \_\_\_\_\_ SEX \_\_\_\_\_ CLASS RANK \_\_\_\_\_ I.D. NUMBER \_\_\_\_\_

Please fill out the information above. Your instructor will not see the results and you will be identified only by number.

We would like to get information on your feelings and behavior in certain common situations. There is no correct or incorrect answer to any of the items. We are simply interested in knowing how people react. If you have never been involved in any of the situations, try to image what your response would be. Choose your response from the following:

I would:

- A. Feel angry and would show it in my behavior.
- B. Feel angry and would not show it in my behavior.
- C. Not feel angry.
- D. Try to do something about the situation without feeling angry.

- \_\_\_\_\_ 1. You're waiting on the right corner for a bus, and the driver intentionally passes you by.
- \_\_\_\_\_ 2. You have heard that an intimate friend spread rumors about you which were unjustified and somewhat uncomplimentary.
- \_\_\_\_\_ 3. You left an article of yours in a repair shop. You call for it at the appointed time but the repair man informs you that he has only just begun to work on it.
- \_\_\_\_\_ 4. Your date telephones at the last minute and breaks the date without an adequate explanation.
- \_\_\_\_\_ 5. The clerk in a store where you have been waiting for some time for service purposely disregards you and waits on a customer who came into the store after you.
- \_\_\_\_\_ 6. Your instructor springs an unexpected and difficult examination for which you are poorly prepared.
- \_\_\_\_\_ 7. Your neighbor's radio consistently prevents you from falling asleep at night. The neighbor refused to do anything about it.
- \_\_\_\_\_ 8. You have been waiting in line for sometime to get into a movie. Someone tries to get ahead of you out of turn.
- \_\_\_\_\_ 9. You had to get out of bed after you had gone to sleep in order to answer the telephone. It proved to be a stranger who gotten the wrong number.
- \_\_\_\_\_ 10. You're a private in the army and you apply for a promotion which is denied you. The promotion is given to a less qualified private who has "pull".

Thank you. J. Reardon

APPENDIX B

The Aptitude Test



**"THE MULTI-APTITUDE TEST"**  
**Part I**

NAME \_\_\_\_\_

Age \_\_\_\_\_ Sex \_\_\_\_\_ Class Rank \_\_\_\_\_

Class \_\_\_\_\_ Date \_\_\_\_\_ I.D. Number \_\_\_\_\_

This is a test which has been given to a large group of college students. It has been found that this test is a fairly accurate predictor of how well people do in college. Your scores will be entered in your academic files for future references. Do as well as you can.

**GENERAL DIRECTIONS**

This test consists of six parts measuring different aptitudes and abilities. Each part has its own time limit. The time limits are short. Work on each part only during the time allowed for it. If you finish a part before time is called, go back and check your work on that part. Do not return to a previous part, or go ahead to a later part. Work rapidly on each part, but try not to make mistakes.

Each part has its own special directions, and one or two examples, correctly marked. Be sure you understand the directions for each part before you start to work on it. The examiner will not answer any questions after the starting signal for a part has been given.

Each problem consists of a pair of names or a pair of numbers. If they are exactly the same, PRINT a CAPITAL S on the line between them if they are different in any way, PRINT a CAPITAL D on the line between them.

Examples: 1. 80172        D        80192

2. Jones Co. Ltd.        S        Jones Co. Ltd.

This is a speed, and accuracy test. You will have two minutes to work on it.

DO NOT BEGIN UNTIL YOU ARE TOLD TO DO SO.



1.		5825327	4825327
2.	Scarlett's Jack Garage		Scarlett Jack's Garage
3.	23532		23532
4.	Lovelace, J. Ben		Lovelace, J. Ben
5.	17872		17872
6.	Inter-City Coal Co.		Inter-City Coal Co.
7.	46537		46537
8.	Vinyard Floor Covering		Vinyard Floor Covering
9.	1324924		1524924
10.	Jackson O. L. Jr.		Jackson O. L. Jr.
11.	202848		202448
12.	Keck and Davis		Keck and Daves
13.	3914981		3914681
14.	Tax Service Inc.		Tax Service Co.
15.	45918		45979
16.	Thomas, Helen		Thomas, Helen
17.	108147		108147
18.	Malonee, John E.		Malonie, John E.
19.	82416		82416
20.	McKenry Bros.		McKenry Bros.
21.	6085661		6085661
22.	Parkrite Inc.		Parkrite Inc.
23.	213634		216634
24.	Underwood & Underwood		Underwood & Underwood
25.	650227		650227
26.	Leake Russell Sons		Leake Russell Son
27.	8159437		8159457
28.	Jones, Clair B. Mrs.		Jones, Clare B. Mrs.
29.	10986		10966
30.	Ventilated Awning Co.		Ventilated Awning Co.

## II Vocabulary

Each test word, in capital letters, is followed by five possible answers. The correct answer is the word which means most nearly the same as the test word. Draw a circle around the correct answer.

Example:

Frequent: A) Always B) Often c) never  
D) Very E) Soon

The answer is (B) often

Mark an answer for every word. If you don't know the meaning of a word, make the best choice you can. You will have three minutes to work on this test.

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1. FRAGILE: A) severed B) sprightly C) tattered D) brittle E) prudent
2. CAPER: A) inconvenience B) prank C) feat D) seizure E) mishap
3. TRANQUIL: A) compassionate B) serene C) sluggish D) seething E) courteous
4. INTRICATE: A) proficient B) exquisite C) minute D) complex E) quaint
5. RETALIATION: A) remission B) expurgation C) surveillance D) reprisal  
E) corroboration
6. FLORID: A) austere B) glacial C) ornate D) trivial E) verdant
7. MENIAL: A) impoverished B) surly C) morbid D) subservient E) militant
8. CONFISCATE: A) ravage B) appropriate C) wrangle D) counterfeit E) impart
9. ABASH: A) maul B) disconcert C) degrade D) reassure E) exult
10. BLANCH: A) flush B) parch C) purify D) bewilder E) bleach
11. EMINENT: A) accomplished B) prolific C) available D) inevitable  
E) illustrious
12. UPBRAID: A) sanction B) promote C) revile D) plait E) constrain
13. PRECIPITOUS: A) audacious B) abrupt C) humid D) passionate E) potent
14. LASSITUDE: A) diligence B) piety C) immortality D) languor E) leniency
15. TRANSIENT: A) extended B) secular C) communicable D) contagious  
E) momentary

### III General Information

Each problem consists of a question or an incomplete sentence, followed by four possible answers. Choose the answer which best answers the question or completes the sentence. Circle the answer you choose.  
Example:

Sausage is ordinarily made from:

A) beef B) mutton C) pork D) venison

Pork is the correct answer (C) pork

If you don't know the answer to a problem, make the best choice you can. You will have two minutes to work on this test.

DO NOT BEGIN UNTIL YOU ARE TOLD TO DO SO.

1. The larynx is in the  
A) head B) neck C) shoulder D) abdomen
2. What process is responsible for bronze turning green with age?  
A) osmosis B) oxidation C) reduction D) condensation
3. Which has food values similar to those of meat?  
A) eggs B) bread C) spinach D) potatoes
4. Madrid is a major city in  
A) Italy B) Spain C) France D) Portugal
5. Mica is a  
A) gas B) liquid C) mineral D) vegetable
6. Who first sailed around the world?  
A) Drake B) Cortez C) Columbus D) Magellan
7. The Andes are in  
A) Asia B) Africa C) Europe D) South America
8. The Corona is a  
A) typewriter B) phonograph C) duplicator D) file cabinet
9. The castanet is used in  
A) hunting B) fishing C) dancing D) sculpturing
10. Faraday was most famous in  
A) war B) science C) religion D) literature
11. Which dealt exclusively with the subject of individual liberty?  
A) the Articles of Confederation  
B) The Declaration of Independence  
C) The Preamble to the Constitution  
D) The first ten amendments to the Constitution
12. Mauve is the name of a  
A) food B) color C) design D) fabric
13. A scimitar is a kind of  
A) ax B) sword C) spear D) knife
14. The Percheron is a kind of  
A) cow B) pig C) sheep D) horse
15. The 20th century is most closely associated with what architectural form?  
A) baroque B) rococo C) functional D) modernistic

#### IV ARITHMETIC

Perform the indicated operations for each problem, and write the answer on the line provided for it. Use the margin for figuring whenever necessary. In all problems involving fractions, reduce your answers to MIXED NUMBERS, with the fractional parts in their LOWEST TERMS. Example:

$$\begin{array}{r} 1 \frac{3}{4} \\ + 2 \frac{2}{4} \\ \hline 4 \frac{1}{2} \end{array}$$

The answer must be  $4 \frac{1}{2}$ , not  $4 \frac{2}{4}$  or  $18/4$  or  $9/2$ .

You will have four minutes to work on this test.

DO NOT BEGIN UNTIL YOU ARE TOLD TO DO SO.

1. 
$$\begin{array}{r} 68 \\ + 89 \\ \hline \end{array}$$

2. 
$$\begin{array}{r} 512 \\ - 463 \\ \hline \end{array}$$

3. 
$$\begin{array}{r} 69 \\ \times 86 \\ \hline \end{array}$$

4. 
$$\begin{array}{r} 4.7 \\ \times .98 \\ \hline \end{array}$$

5. 
$$46 \overline{) 4462}$$

6. 
$$8.4 \overline{) 562.8}$$

7. 
$$\begin{array}{r} 4 \frac{3}{4} \\ + 5 \frac{2}{3} \\ \hline \end{array}$$

8. 
$$\begin{array}{r} 9 \frac{2}{3} \\ - 3 \frac{3}{4} \\ \hline \end{array}$$

9.  $2 \frac{2}{3} \times \frac{3}{4} \div \frac{2}{5} =$  \_\_\_\_\_

10.  $3 \frac{1}{3} \div 5 \times 1 \frac{1}{4} =$  \_\_\_\_\_

Each problem consists of a series of six numbers formed according to some rule. You are to find the rule and then write the next two numbers of the series on the lines at the right. Example:

12 12 9 9 6 6 3 3

The rule in the example is to write each number twice, and to subtract 3 from the number of each pair to get the number of the next pair.

You will have four minutes to work on this test.

DO NOT BEGIN UNTIL YOU ARE TOLD TO DO SO.



1. 9 19 29 39 49 59 \_\_\_\_\_
2. 31 28 32 29 33 30 \_\_\_\_\_
3. 1 2 2 3 3 4 \_\_\_\_\_
4. 29 28 26 23 19 14 \_\_\_\_\_
5. 1 4 9 16 25 36 \_\_\_\_\_
6. 16 30 42 52 60 66 \_\_\_\_\_
7. 2 5 7 12 15 17 \_\_\_\_\_
8. -2 0 4 12 28 60 \_\_\_\_\_
9. 302 150 212 100 122 50 \_\_\_\_\_
10. 24 1/8 6 1/4 1 1/2 1/2 \_\_\_\_\_

Each problem consists of a very common five-letter word, but the letters have been scrambled. You are to try to find the correct word, and PRINT it on the line at the right. Example:

VEOBA      ABOVE

You will have five minutes to work on this test.

DO NOT BEGIN UNTIL YOU ARE TOLD TO DO SO.

1. EMNOY 

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2. VORAF 

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3. OUBAT 

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4. ACCHT 

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5. NIRBG 

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6. VINGE 

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7. EHSUO 

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8. DNORU 

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9. SDERS 

---
10. CTURO 

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11. CEORV 

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# APPENDIX C

## Distribution of Preliminary Test of Questionnaire

MALE		FEMALE		COMBINED	
Score	Frequency	Score	Frequency	Score	Frequency
18	1	19	1	19	1
17	1	17	1	18	1
15	1	14	3	17	2
14	3	13	3	15	1
12	3	11	1	14	6
11	3	10	4	13	3
10	3	9	3	12	3
9	3	8	3	11	4
8	4	6	2	10	7
		2	1	9	6
				8	8
				6	2
				2	1
$\bar{X} = 11.36$ s.d. = 3.14		$\bar{X} = 10.59$ s.d. = 3.94		$\bar{X} = 10.98$ s.d. = 3.298	

## Questionnaire and Experimental Task Response Means

	Experimental		Control	
	M	F	M	F
Questionnaire	8.90	9.14	9.50	9.00
Exper. Task	5.74	5.90	3.70	3.59
Number of S's	19	35	10	22

# APPENDIX D

## Raw Data for Males Experimental Group

<u>S</u>	<u>Score on</u> <u>Questionnaire</u>	<u>Score on</u> <u>Exper. Task</u>
1	8	7
2	8	9
3	6	4
4	7	8
5	13	8
6	7	4
7	8	4
8	9	1
9	10	8
10	9	4
11	11	6
12	6	1
13	8	4
14	8	1
15	16	11
16	4	6
17	9	8
18	10	8
19	13	7

# APPENDIX E

## Raw Data for Females Experimental Group

<u>S</u>	<u>Score on</u> <u>Questionnaire</u>	<u>Score on</u> <u>Exper. Task</u>	"	<u>S</u>	<u>Score on</u> <u>Questionnaire</u>	<u>Score on</u> <u>Exper. Task</u>
1	14	8	"	21	6	8
2	6	7	"	22	9	7
3	5	7	"	23	10	4
4	6	4	"	24	8	5
5	7	7	"	25	12	7
6	8	6	"	26	12	7
7	12	7	"	27	7	9
8	9	4	"	28	11	9
9	7	5	"	29	16	4
10	8	3	"	30	8	8
11	9	3	"	31	11	6
12	10	8	"	32	13	7
13	5	3	"	33	6	8
14	8	6	"	34	9	6
15	8	1	"	35	6	1
16	8	4	"			
17	10	3	"			
18	12	8	"			
19	11	10	"			
20	10	7	"			



# APPENDIX F

## Raw Data for Control Group

<u>Males</u>				<u>Females</u>		
<u>S</u>	<u>Score on Questionnaire</u>	<u>Score on Exper. Task</u>	"	<u>S</u>	<u>Score on Questionnaire</u>	<u>Score on Exper. Task</u>
1	15	3	"	1	7	2
2	14	1	"	2	16	2
3	7	4	"	3	16	3
4	4	7	"	4	11	2
5	6	1	"	5	6	7
6	10	10	"	6	13	6
7	7	1	"	7	11	1
8	11	2	"	8	11	3
9	12	3	"	9	10	2
10	9	5	"	10	8	2
			"	11	5	1
			"	12	10	3
			"	13	3	2
			"	14	10	2
			"	15	6	3
			"	16	10	6
			"	17	9	7
			"	18	4	7
			"	19	8	7
			"	20	8	5
			"	21	5	3
			"	22	12	3