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The Assessment of Attitudes Toward Psychology as an Effective Variable in Psychological Research

Joseph Galloway
Western Kentucky University

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Galloway,

Joseph W.

1971

THE ASSESSMENT OF ATTITUDES TOWARD PSYCHOLOGY AS
AN EFFECTIVE VARIABLE IN PSYCHOLOGICAL RESEARCH

A Thesis

Presented to

the Faculty of the Department of Psychology

Western Kentucky University

Bowling Green, Kentucky

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

by

Joseph W. Galloway

July 1971

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THE ASSESSMENT OF ATTITUDES TOWARD PSYCHOLOGY AS
AN EFFECTIVE VARIABLE IN PSYCHOLOGICAL RESEARCH

APPROVED July 1, 1971 :
(Date)

James R. King
Director of Thesis

John C. Hester

John D. Hall

J. J. Sandefur
Dean of the Graduate School

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Finally I would like to add a personal note. When you first get going on a thesis, it all seems like great fun, very exciting and a thoroughly rewarding experience, but somewhere along the line the crunch comes and a general tightening up is required; a rambling collection of ideas has to be made to conform to administrative constraints. To get the thesis out becomes a battle in itself demanding a single-mindedness which gives little time for domestic responsibilities. Wives get hit pretty hard in the process in that they have to listen to, evaluate,

and support a literary project which seems endless. My wife missed none of this agonizing process, and I would like to acknowledge her endurance and understanding help.

July 1971

Joe Galloway

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Abstract

This research investigated the reliability and validity of the Psychological Research Survey (PRS). Naive introductory psychology students who had not previously participated in psychological experimentation served as Ss for the reliability assessment. Split-half and test-retest coefficients indicated high reliability. Construct validity was estimated with the use of developmental and situational tests. The PRS was expected to discriminate a more positive attitude toward psychology and psychological research as students progressed from introductory to more advanced courses in psychology. A simple analysis of variance of Ss' PRS scores failed to indicate a significant result. A situation was designed whereby Ss behavior indicated their attitudes. A chi-square comparison of the behavioral measure and PRS scores failed to indicate a significant discrepancy. Criterion validity was estimated by comparing PRS scores with final course grades in an introductory psychology class. No relationship was indicated between the PRS scores and course grades. Although apparently consistent over time and internally, the PRS does not appear to measure the construct, "attitude toward psychology and psychological research."

Introduction

As a part of the growing body of psychological research into the nature of psychological experiments, the human S as an independent variable has come under experimental scrutiny. Of particular interest has been the emphasis placed on the demand characteristics inherent in the social interaction between E and S. Orne (1962) has indicated that the S responds to the totality of cues or demand characteristics of the experiment and that these cues can convey an experimental hypothesis to the S which then may become a significant determiner of the S's behavior. A central assumption of Orne's position is that the volunteer S can be expected to behave in an experimental context in a manner designed to play the role of a "good subject", or in other words, to validate the experimental hypothesis. In this view the S, seeking to make a contribution to science and human welfare in general, has a very real stake in the successful outcome of the experiment.

In contrast to this position Argyris (1968) has suggested that since deception is involved in many experiments, Ss now come to experiments expecting to be tricked. He indicates that Ss are beginning to behave like lower level employees in companies, by second-guessing and trying to beat the E at his own game. From this point of view, if the S likes the E he cooperates; if he does not, then great delight is taken in confounding the experiment as much as possible.

Considering the human S as an independent variable to be controlled, rather than as a passive respondent to treatment, researchers have

been guided by a very diversified set of assumptions. Following the line of thought established by Orne, Holmes (1967) found that amount of experimental experience is a potent factor which must be accounted for if the results of experiments are to be valid and consistent from laboratory to laboratory. Holmes' work indicated that participation in more experiments increased the probability that Ss would become aware of the reinforcement contingency in a verbal conditioning experiment and, once aware, that they would be more cooperative. Using a similar verbal conditioning experiment Mondy (1968) examined the relationships among degrees of awareness of expectations and intentions to comply. Findings indicated that only aware Ss reporting intentions to comply with perceived experimental expectations were effectively conditioned. Awareness of expectations alone was found to be unrelated to conditioning which contradicts Holmes' earlier contention that aware Ss would be more cooperative. The short history of research concerned with Ss awareness and attitudes appears to be replete with contradictions. The work done by Page (1969) on the classical conditioning of attitudes supports the contention that conditioning effects are due to Ss becoming aware of demand characteristics and cooperating with them. The conflict between results of these studies is probably due in large part to the many procedural differences among them. Specifically, the different questionnaires and scoring techniques used in assessing attitudes and awareness seem to be the prime contributors to this problem.

More recently, Adair and Fenton (1970) have viewed the problem of differential performance of Ss in terms of the pre-experiment attitudes manifested by the Ss. Their work tests the assumption that S differences are due to differences in pre-experiment attitudes toward psychol-

ogy and psychological research which leads to a continuum of motivation to cooperate with the experimenter. They have developed a 52 item scale to measure S's attitudes toward psychology. The Psychology Research Survey (PRS) (Appendix A) was developed from a large number of statements which closely paraphrased Orne's detailed description of the S's perceived role in experiments or which reflected variations in attitudes toward psychology and psychological research. After administration of the scale to 201 introductory psychology students at the University of Manitoba, item analysis yielded the final 52 item scale. Scored according to a five-choice Likert format, the range of scores is 52 to 260, with high scores representing positive attitudes toward psychology and psychological research. The implied scoring method suggests that all items are considered positive and a total score is obtained simply by adding the scores of each item across the form.¹ Corrected split-half reliability coefficients of .89 to .95 have been reported for the PRS (Adair & Fenton, 1970).

Using an attitude change task, developed by Molnar (1955) to measure attitudes toward animal vivisection, Adair and Fenton (1970) applied the PRS under the guise that two separate studies were being run. The PRS represented a measure of pre-experiment attitude while pre and post test vivisection measures indicated opinion change in the 144 introductory psychology students who served as Ss. Based on high, medium and low scores on the PRS, scores were arranged in a two-way analysis of variance. The significant interaction between PRS scores and the vivisection attitude change measures supported the prediction that Ss who have more positive attitudes toward psychology would show greater opinion change. More positive attitudes in this case were represented

by high scores on the PRS. Opinion change was reflected by S's scores on a six-choice Likert scale which was used as both a pre-test and post test measure. High scores on this measure indicated pro-vivisection opinion. The pre-test vivisection measure was administered after a 250-word factual description of vivisection. This same measure was administered again after a 500 word, tape recorded, pro-vivisection message. The results indicated that the extent of hypothesis confirming behavior obtained from Ss was a function of their attitudes toward psychology and psychological research prior to participation in a psychological experiment.

As a follow-up on this study Adair (1970) examined Ss' pre-experiment attitudes toward psychology and psychological research as a possible determinant of Ss' willingness and desire to cooperate with the E in studies of verbal conditioning. He hypothesized that Ss who are aware of the reinforcement contingency and cooperate with the E in studies of verbal conditioning will have a more positive attitude toward psychology than Ss who express negative behavioral intentions. Prior to the experiment 144 introductory psychology students from the University of Manitoba completed the PRS. This provided a measure of pre-experiment attitude, while a nine question post-experimental questionnaire provided measures of awareness and behavioral intentions when rated by three independent judges. The standard Taffel (1955) task was used for the verbal conditioning study. The hypothesis that Ss who expressed positive behavioral intentions would have more positive attitudes toward psychology and psychological research was not supported. This was contrary to the findings in the Adair and Fenton (1970) study.

Problem

Differences in the studies cited above can be attributed to procedural differences, different questionnaires and scoring techniques. According to Argyris (1968), "...the more easily the variables can be observed and measured, the greater the reliability, the greater the probability for future public verifiability, the more rigorous will be the research." It would appear that researchers will continue to use a myriad selection of measures to assess attitude and behavioral intentions of Ss and that by virtue of this procedure experiments will continue to produce differential findings. Adair and Fenton (1970) operationally defined positive attitude toward psychology and psychological research as a high score on the PRS. This definition presupposes the reliability and validity of the instrument which in fact may not be the case. There is undoubtedly a need for a measure to ascertain the attitudes of Ss prior to, during and after experimentation. The inability to isolate and quantify this source of variance will consistently lead to replication and validation difficulties. The present study will be devoted to an examination of the PRS in an effort to obtain estimates of its reliability and validity. If the PRS can be established as a reliable and valid instrument, it can be used to provide consistent procedures from laboratory to laboratory.

Reliability

Inter-Judge Rating

Examination of the PRS questionnaire indicates that items appear to have both positive and negative connotations. That is, some items would logically indicate a positive attitude if rated "strongly agree" on a 5-point Likert scale. Other items would suggest a negative attitude if rated in the same manner. Thus, adding the ratings on each item would not produce a total score indicating positive attitudes.

Method. Four judges were selected to rate each of the questionnaire items as typifying positive or negative attitudes. The judges were asked to indicate their first impressions of each item and to proceed with their rating task as rapidly as possible.

Results. Total agreement among the judges was found. Ratings for each of the items are listed in Appendix A. According to Oppenheim (1966), if a high scale score is going to mean a positive attitude toward psychology and psychological research, then agreement with the statements that imply positive attitudes should be scored 4 or 5. If on the other hand, a high score will mean a negative attitude to students, then the scoring on the items that imply positive attitudes to students should be reversed. Since Adair and Fenton (1970) have stated that a high score on the PRS indicates a positive attitude toward psychology and psychological research, all item scales indicated as negative were reversed in scoring the survey.

Split-Half

Method. In an effort to obtain an estimate of the internal consistency of the PRS, a sample of 67 Ss at Western Kentucky University was selected to complete the survey. These Ss were introductory psychology students who had not participated in psychological experimentation. Administration of the scale took place in the early part of the fall semester to insure that students did not have the opportunity for familiarization with the experimental process. The method proposed by Anastasi (1968) was used to obtain the split-half index.

Results. A corrected even-odd, split-half reliability yielded a Pearson Product-Moment correlation of .87. This estimate favorably compares with the reliabilities of .89 to .95 reported by Adair and Fenton (1970). Derivation of the corrected split-half reliability index is included in Table 1 of Appendix B. This finding appears to support the contention that the PRS is a reliable measure. Although the questionnaire appears internally consistent, it is necessary to address the questions of consistency over time and whether the construct, "attitude toward psychology and psychological research," is consistently discriminated.

Test-Retest

Method. It is to be expected that the PRS will be administered on two or more occasions to the same Ss as a measure of attitude change prior to, during, or after an experimental situation. With this in mind an estimate of its consistency over time would be desirable. A sample of 27 students enrolled in an experimental psychology course at Western Kentucky University was selected to complete the PRS. A test-retest was run with a two-day time lapse. Testing was accomplished at

the same time of day in the same classroom. Assuming that the PRS would be readministered within a few hours at the least, or two or three days at most during an experiment, the two-day time frame was considered adequate for readministering the instrument. Since two teachers were alternately instructing the class, one of them gave the test and the other gave the retest; however, this would cause little difference in scores as the students read the printed instructions themselves on both occasions.

Results. A test-retest index of .90 was obtained using the Spearman-Brown formula. Scoring was accomplished with negative item scales being reversed. Scaled scores were transformed by subtracting a constant factor of 100 from each score, to render calculation more manageable. The correlation obtained is consistent with the reliability range reported by Adair and Fenton (1970). This suggests that PRS scores are consistent over time within the two-day time frame, which would provide acceptable reliability in an experimental situation. Calculation of the test-retest index is included in Table 2 of Appendix B.

Summary

Using the scores of introductory psychology students, a split-half reliability estimate of .87 was obtained. This finding closely approximates split-half indices reported by Adair and Fenton (1970). A test-retest index of .90, obtained from the correlation of the PRS scores of advanced psychology students, indicates that the PRS is consistent over time within a two-day time frame. At this point the PRS appears to have the consistency necessary for use in an experimental framework.

Validity

Developmental Test

Consistent with the suggestion of Adair and Fenton (1970), construct validity has been assessed through demonstration of relationships between scale scores and external criteria. Scale scores obtained from the initial administration conducted with naive freshmen were compared with scores of psychology majors currently enrolled in statistics and experimental psychology, and history and systems of psychology courses at Western Kentucky University. One would expect the scores of psychology majors to reflect a significantly more positive attitude toward psychology and psychological research than the scores of naive, first semester freshmen. To carry this a step further, higher scores would be expected as students progress from introductory psychology through statistics and experimental psychology courses to the history and systems of psychology course. The latter two courses are required for psychology majors and necessitate greater commitment and a more positive attitude by students. Those students who do not have positive attitudes generally change their major, especially after statistics and experimental psychology courses.

Method. The PRS was administered to 67 introductory psychology students, 38 students enrolled in the history and systems of psychology course, and 32 students enrolled in statistics and experimental psychology. In each class, the teacher administered the PRS with the students reading the instructions for themselves. A common factor of 130 was

subtracted from all raw scores to facilitate calculation.

Results. A simple analysis of variance indicated no difference between the means of the three groups of Ss, $F < 1$. This indicates that the PRS does not discriminate any differences in attitude toward psychology and psychological research between naive freshmen enrolled in introductory psychology and psychology majors enrolled in courses required for a degree in psychology. Since one would expect a positive change in attitude as the student progresses to more advanced courses, it appears that the PRS does not measure the construct, "attitude toward psychology and psychological research." Data for the developmental test, and a summary of the analysis of variance is included in Tables 3 and 4 of Appendix B.

Situational Test

Method. Another method of estimating the construct validity can be found in a situational test. In this case, the behavior of Ss should indicate positive or negative attitudes toward psychology and psychological research. The PRS was administered to two introductory psychology classes by the faculty members who teach the classes. The only supplemental instructions given consisted of the following statement by each teacher, "A psychology professor is conducting research on student opinions concerning experimentation with students serving as subjects." Each teacher was asked not to discuss the assignment of extra points to student grades as a result of having participated in experimentation until completion of this research. For purposes of analysis, the initial group of 84 Ss were divided according to the distribution of PRS scores into high, medium and low groups. The scores were then converted into percentiles and divided into quartiles. Scores of the 20 Ss falling

in the upper quartile and the 20 Ss falling in the lower quartile constituted high and low scores and were used for further analysis. The scores of the 44 Ss constituting the two middle quartiles were discarded as not prominently characterizing positive or negative attitudes toward psychology and psychological research.

Ss scoring in the upper and lower quartiles on the PRS were instructed to report to an experimental room at a certain time for briefing. Instructions given at that time are as follows:

You have been selected to participate in research that I am conducting. Initially the only information I can give you is of a limited nature concerning the general requirements of the experiment, and what will be expected of you during the conduct of the research. Time will be a factor since approximately two hours will be required. On the first day, fifteen minutes will be required for general instruction and distribution of materials. The remainder of the hour on the first day will be spent completing the various tests to be administered. On _____, those of you who desire to participate are to report to room _____ of this building at _____ p.m. After completion of the tests, you will have the option of selecting the time for the second series of tests on either of the two following days. If promising the results of this research will be submitted for publication and we will have taken an important step in understanding the college student. At the conclusion of the last experimental period you will be informed of the facts and ramifications of this endeavor. Since some students have previously asked to be included in the research, all of you will not be needed for the conduct of the experimentation. If those of you who are interested in participating would sign the cards I distributed and turn them in, I will see you _____ at _____ p.m.

Students who questioned the E concerning extra grade points for participation in the research were told that the E was not aware of any extra credits available for participation but that he would check with the teacher concerned for confirmation.

Of the 40 Ss selected to participate 3 were absent from class reducing the number of possible participants to 37. The 18 Ss who signed the cards and turned them in demonstrated an intent to participate,

reflecting a more positive attitude toward psychology and psychological research than the 19 Ss who did not sign the card. In an effort to insure that Ss reflected a strong positive behavioral attitude, only those Ss who participated in the testing were considered as having demonstrated a positive attitude.

Of the 18 Ss who indicated an intent to participate 13 Ss reported to the experimental room. The task assigned to these 13 Ss consisted of a 100 question aptitude test that was designed by the E. Ss were given a short briefing covering procedures for marking answer sheets and were told that they would have 25 minutes on section one of the test, 15 minutes on section two and 15 minutes on section three. Only those Ss who signed the intent cards and took the aptitude test were considered as having demonstrated a positive attitude toward psychology and psychological research.

Results. PRS scores of the Ss who scored in the upper and lower quartiles were arranged in terms of whether they participated in all phases of the experiment or not as shown in Table 1. The initial PRS score distribution is included in Table 5 of Appendix B. Results of the chi-square test were not significant, $\chi^2(1) = .11$, $p > .05$, indicating that Ss who participated in all phases of the experiment did not differ in attitude, as measured by the PRS, from those Ss who did not participate. This finding agrees with the results of the developmental test and supports the contention that the PRS does not measure the construct, "attitude toward psychology and psychological research."

TABLE 1

The Frequency of Participation (P) and Non-Participation (NP)
as a Function of High and Low PRS Scores

		<u>Behavioral Measure</u>		
		P	NP	
<u>PRS Scores</u>	High	7	13	20
	Low	6	11	17
		13	24	37

Note. -- $\chi^2(1) = .11, p > .05$.

Criterion-Related Validity

Method. Using the Pearson Product-Moment formula, PRS scores of the 67 introductory psychology students were correlated with their final course grades. It was anticipated that students with high final course grades would have high scores on the PRS.

Results. The resulting correlation of $-.05$ indicates that high scores on the PRS bear no relationship with final course grades. One would tend to believe that a positive attitude toward psychology and psychological research would be indicative of high motivation and a consequent high course grade; however, the findings do not support this hypothesis. Calculation of the criterion-related validity is located in Table 6 of Appendix B.

Summary

As students progress from introductory to more advanced courses the PRS was expected to discriminate a more positive attitude toward psychology. A simple analysis of variance of the data gathered indicated no significant difference in the S's PRS scores. Students were presented with a situation whereby they could behaviorally demonstrate

their attitudes. A chi-square comparison of the behavioral measure and PRS scores indicated no significant relationship. Criterion validity was estimated by comparing PRS scores with final course grades. The resulting negative correlation indicated no relationship between grades and PRS scores. These findings fail to support the contention that the PRS is a valid measure.

Discussion

Findings

The results of the split-half reliability, test-retest reliability and inter-judge ratings indicate that the PRS is a reliable measure which is consistent over time and internally. However, an instrument can be reliable without being valid. Both developmental and situational tests support the contention that the PRS does not measure the construct, "attitude toward psychology and psychological research." This is further supported by the lack of relationship between PRS scores and final course grades as demonstrated by the extremely low correlation between these two indices. This finding supports the earlier work done by Adair (1970) and contradicts the study conducted by Adair and Fenton (1970). The PRS appears to be a reliable measure, both internally and over time; however, there is no indication that it measures the construct in question.

Limitations

It is quite possible that course grades, and attitude as behaviorally defined in the developmental and situational tests, do not serve as adequate criteria for comparison with the PRS. Although efforts were made to standardize instructions and control the testing situations as much as possible, the physical presence of the experimenter, time of day, or the content of the instructions themselves may have confounded the results. Since the term "attitude" is an abstract, it is very difficult to find criteria for comparison. In addition the results of the present

study may be biased due to the lack of information concerning the actual scoring method used by Adair and Fenton (1970). Although four judges were in total agreement concerning the test items having positive and negative connotations, a different appraisal of the items could easily change the shape of the score distributions.

Implications for Future Research

In view of the finding that the PRS is a reliable instrument, future research should be conducted to determine what it does measure. Discussion with the teachers of the introductory psychology classes used in the research revealed that the students who made better grades, in the teacher's opinion, scored in the upper quartile range of the PRS, while students considered average to poor scored in the middle and lower quartile range. This observation would seem to indicate that the PRS may be related to intelligence, achievement or sociability in the classroom. Although the criterion-related validity correlation of $-.05$ does not support the observation, course grades may not serve as adequate criteria for comparison with PRS scores. Since most entering freshmen have taken the American Council on Testing (ACT) battery prior to admittance, a high correlation between this measure and PRS scores may bear out the teachers' observations.

The use of a predominantly freshman, introductory psychology population may have presented conformity problems in the present study. If this is true then the design of a situational test or behavioral test to isolate the attitude variable becomes very difficult; since, Ss with an actual poor attitude may tend to follow instructions. Problems of this type could be reduced by using the PRS with less naive, more advanced students such as graduate students. The authority figure-

conformity problem could be mitigated to some extent with the use of tape recorded or remote controlled instruction where the presence of the E would be reduced to a minimum.

Close examination of the statements in the PRS reveals that some items appear to be too difficult in terms of the terminology used to effectively discriminate the Ss attitude. For example, statement 40 contains concepts such as "validly generalize" and "population at large", which the naive freshman may be unable to comprehend at this stage of his education. Other terms such as "reliable" are likely to be misunderstood.

The Adair and Fenton (1970) article did not indicate the method of item analysis used or how it was accomplished. In an effort to ascertain some indication of the difficulty and discrimination indices of each item, an item analysis could be conducted by counting positive items rated 4 or 5 as correct and items rated 1 or 2 as incorrect answers. Items rated as 3 (undecided) could not be considered in this analysis. Reversing the scoring of negative items, ratings of 1 or 2 would be considered correct and items rated 4 or 5 would be incorrect. According to Anastasi (1968), items approaching the .50 difficulty level are preferable for item selection. Selection of items meeting a .40 to .60 selection criteria would theoretically increase the item validity of the PRS. Since the number of items would probably be reduced by this procedure, the reliability index would also be lowered. Even so, if the validity index could be increased, a more acceptable instrument would result in terms of its ability to discriminate the construct being measured.

Another alternative for future research with the PRS would be changing the name of the original construct by finding an indication of the construct measured by the PRS. Since a pinpoint definition of the construct measured is highly unlikely at this point, a "shotgun" approach may be the best alternative for exploratory research. The previous contention of the relationship between intelligence or achievement and PRS scores could be explored along with other paper and pencil measures in an attempt to gain an indication of the actual construct measured by the PRS. The psychologist, psychiatrist, and physician scales of the Strong Vocational Interest Blank (SVIB) could be correlated with the PRS scores to determine the relationship, if any exists, between them. The rationale for the use of these particular scales of the SVIB would consist of the hypothesis that interest in psychology, psychiatry or medicine is related to a positive attitude toward psychology and psychological research.

Another possible measure for comparison with the PRS is the Sensation Seeking Scale, devised by Zuckerman, Kolin, Price and Zoob (1964). A high correlation between these scales would indicate that the PRS is related to sensation seeking behavior. Similarly the Embedded Figures Test could provide some indication as to whether the high scorer on the PRS is a field dependent or field independent. Factor analysis of the correlation matrix established with the use of the aforementioned tests could provide an indication of the dominant factor or factors measured by the PRS.

Unless some indication of the construct measured by the PRS is found or item analysis results in an acceptable measuring instrument, the PRS should not be used for its intended purpose. There is an

undeniable need for an instrument to reliably and validly assess the pre-experiment attitudes of Ss. Since the PRS is the only instrument which closely approximates that goal, every effort should be made to develop its potential.

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Footnote

¹Correspondence with Dr. Adair has failed to yield the scoring method used with the PRS.

APPENDIX A

PSYCHOLOGY RESEARCH SURVEY

As you may know, some of the practices commonly used in psychological experiments employing human subjects are coming under review. The Director of the U.S. Public Health Service has made known his concerns in this area. As a result, prominent psychologists at Harvard, Columbia and Northwestern Universities are now investigating the psychological experiment from the subject's point of view.

As most subjects are drawn from University students, their opinions are being sought. The attached questionnaire is being sent to certain North American universities to sample student feelings about psychology and psychologists, as they function within the framework of the psychological experiment. From this and other work, it is hoped to establish a set of guide lines which will govern future investigations.

This is the first large scale and systematic inquiry into students' feelings about acting as subjects. We would ask you, then to complete the questionnaire frankly and honestly.

A standard answer sheet is provided for your responses. Do not make any marks on the questionnaire itself.

1. Enter your name, sex, age and today's date on the top row of the answer sheet.
2. Immediately below your name write your social security number.
3. In the space labelled "form", indicate the curriculum in which you are enrolled (for example: Arts & Science, Teacher Ed., etc.)
4. In the space provided for "Test #", indicate your University year.
5. Check that you have correctly filled in the required information, as later in the year the questionnaire will be given to other classes in other courses and it is imperative that there not be duplications in this survey.
6. Now read the question below and select your answer which best describes your feelings on this statement in accordance with the following scale:

1	2	3	4	5
STRONGLY DISAGREE	DISAGREE	UNDECIDED	AGREE	STRONGLY AGREE

- a. Chocolate pecan ice cream is good with chocolate layer cake.

If you strongly agreed with the statement, you should cross out number 5 on the answer sheet like this:

1. 1 2 3 4 ~~5~~

If you strongly disagreed with it, you should cross out number 1 on the answer sheet like this:

1. ~~X~~ 2 3 4 5

As you can see, you have a choice of: (1) strongly disagree, (2) disagree, (3) undecided, (4) agree, and (5) strongly agree for each statement. Make your own judgments in accordance with your degree of acceptance or rejection of the statement. However, you should try to avoid the "undecided" response as much as possible, as it is your feelings (either positive or negative) towards each of the statements that is being sought.

7. Turn the page and begin. Answer each of the items and record your answers on the answer sheet.

* * * * *

1	2	3	4	5
STRONGLY DISAGREE	DISAGREE	UNDECIDED	AGREE	STRONGLY AGREE

- 1. Most psychology experiments are worthless since even the most carefully controlled experiments lead to inconclusive results.
- + 2. Through experimentation psychologists have made a real contribution to the understanding of man.
- 3. Psychologists would be better advised to forget the laboratory, and go into the field where the "real people and problems" are.
- 4. Many of the questions asked in testing are personal and are none of the experimenter's business.
- + 5. Given a free choice, most students would be willing to volunteer for experiments.
- 6. Many experimenters are smug and take a pretty high-handed attitude with subjects.
- 7. Most experiments in psychology are concerned with trivial observations of artificial behavior.
- 8. Tests and other experimental manipulations are generally not reliable measures of personality and behavior.
- 9. Most experiments deal with such a small segment of behavior that they are meaningless in the broad picture.
- + 10. People generally express their real feelings on psychological tests.
- 11. Psychology experiments are fun but do not prove anything.
- 12. Human behavior is too complex to cut up and study piece by piece in the laboratory.
- + 13. Most people would say that their experience as a subject in psychological experiments was favorable.
- + 14. When an individual signs up for an experiment, it involves a commitment to do what is asked to the best of his ability.
- + 15. Most students participate willingly in experiments.
- 16. People rarely express their "real" selves in psychology experiments.
- 17. Experiments in psychology have no value because of the inherent diversity of man and his environment.

1
STRONGLY
DISAGREE

2
DISAGREE

3
UNDECIDED

4
AGREE

5
STRONGLY
AGREE

- 18. Many experiments ask too much from their subjects.
- 19. Experiments are nothing but "busy work" for psychologists.
- 20. Psychology experiments are too time consuming.
- 21. Some experimenters just seem to be waiting for the subjects to make fools of themselves.
- + 22. As a matter of personal pride, most individuals would try to do their best when acting as a subject.
- 23. Experimentation is of no practical value in the understanding of the fundamental causes of behavior.
- 24. The psychological journals are mostly filled with unimportant trivia.
- 25. It doesn't matter too much what subjects do; the experimenter usually manipulates the data to prove his hypothesis anyway.
- + 26. Psychological tests are generally reliable measures of personality.
- 27. Laboratory studies in psychology are too artificial to produce valid data.
- + 28. Most students are "good" subjects, that is, they perform well in their role as experimental subjects.
- 29. Many subjects in psychological experiments go through the motions without really trying.
- + 30. The experimental method can be used effectively in the study of human behavior.
- + 31. Subjects in most psychology experiments are treated with respect.
- + 32. The experimental approach to psychology has been both fruitful and helpful in understanding human nature.
- + 33. Most experimenters are considerate and polite in their treatment of subjects.
- + 34. Participation in psychology experiments is not a great imposition on students.
- 35. Psychologists sometimes forget that subjects are still human beings.

- | 1
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|---------------------------|---------------|----------------|------------|------------------------|
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-
- + 36. Through psychological tests and experiments psychologists have acquired the knowledge to predict behavior in many real life situations.
 - + 37. Most students follow the experimenter's instructions carefully so that they will be able to perform as a good subject.
 - + 38. Laboratory studies in psychology have contributed significantly to the knowledge of mankind.
 - + 39. The complexity of individuals make it necessary to study human behavior under controlled conditions.
 - + 40. From experiments, psychologists can validly generalize to the population-at-large.
 - 41. Subjects in most psychology experiments are treated as guinea pigs.
 - 42. Many students do not cooperate and therefore make poor subjects.
 - + 43. Psychology has proven its worth as an experimental science.
 - + 44. Any minor discomfort that subjects may go through such as electric shock, embarrassment, etc., is worth it in the long run.
 - 45. Psychological data is useless because its interpretation is based on the manipulation of statistics.
 - + 46. Many students feel a responsibility to cooperate in any way possible in the pursuit of knowledge.
 - 47. Subjects frequently feel manipulated by the experimenter.
 - 48. Participation in psychological experiments is a waste of the students' time.
 - 49. Students should not be asked to give up their time to serve as subjects.
 - + 50. College students tend to share with experimenters the hope that the study in which they are participating will in some material way contribute to science.
 - + 51. Subjects in psychology experiments are "contributors to science."
 - 52. Experiments in psychology almost always involve deception or "tricking" the subject in some way.

APPENDIX B
STATISTICAL TABLES

TABLE 1

Data for Split-Half Reliability *

Ss	Even	Odd	x	y	x ²	y ²	xy
1	10	14	-18.33	-15.30	335.99	234.09	+280.45
2	22	31	- 6.33	+ 1.70	40.07	2.89	- 10.76
3	24	23	- 4.33	- 6.30	18.75	39.69	+ 27.28
4	29	21	+ .67	- 8.30	.45	68.89	- 5.56
5	32	32	+ 3.67	+ 2.70	13.47	7.29	+ 9.91
6	25	21	- 3.33	- 8.30	11.09	68.89	+ 27.64
7	19	11	- 9.33	-18.30	87.05	334.89	+170.74
8	23	24	- 5.33	- 5.30	28.41	28.09	+ 28.25
9	29	28	+ .67	- 1.30	.45	1.69	- .87
10	31	34	+ 2.67	+ 4.70	7.13	22.09	+ 12.55
11	45	45	+16.67	+15.70	277.89	246.49	+261.72
12	31	32	+ 2.67	+ 2.70	7.13	7.29	+ 7.21
13	24	28	- 4.33	- 1.30	18.75	1.69	+ 5.63
14	43	39	+14.67	+ 9.70	215.21	94.09	+142.30
15	30	32	+ 1.67	+ 2.70	2.79	7.29	+ 4.51
16	27	30	- 1.33	+ .70	1.77	.49	- .93
17	23	28	- 5.33	- 1.30	28.41	1.69	+ 6.93
18	24	20	- 4.33	- 9.30	18.75	86.49	+ 40.27
19	39	42	+10.67	+12.70	113.85	161.29	+135.51
20	27	30	- 1.33	+ .70	1.77	.49	- .93
21	27	32	- 1.33	+ 2.70	1.77	7.29	- 3.59
22	37	42	+ 8.67	+12.70	75.17	161.29	+110.11
23	50	45	+21.67	+15.70	469.59	246.49	+340.22
24	27	25	- 1.33	- 4.30	1.77	18.49	+ 5.72
25	30	25	+ 1.67	- 4.30	2.79	18.49	- 7.18
26	13	20	-15.33	- 9.30	235.01	86.49	+142.57
27	37	35	+ 8.67	+ 5.70	75.17	32.49	+ 49.42
28	28	34	- .33	+ 4.70	.11	22.09	- 1.55
29	10	8	-18.33	-21.30	335.99	453.69	+390.43
30	25	30	- 3.33	+ .70	11.09	.49	- 2.33
31	30	32	+ 1.67	+ 2.70	2.79	7.29	+ 4.51
32	22	29	- 6.33	- .30	40.07	.09	+ 1.90
33	9	21	-19.33	- 8.30	373.65	68.89	+160.44
34	13	16	-15.33	-13.30	235.01	176.89	+203.89
35	35	31	+ 6.67	+ 1.70	44.49	2.89	+ 11.34
36	30	23	+ 1.67	- 6.30	2.79	39.69	- 10.52
37	27	18	- 1.33	-11.30	1.77	127.69	+ 15.03
38	29	27	+ .67	- 2.30	.45	5.29	- 1.54
39	38	27	+ 9.67	- 2.30	93.51	5.21	- 22.24
40	15	22	-13.33	- 7.30	177.69	53.29	+ 97.31
41	16	18	-12.33	-11.30	152.03	127.69	+139.33
42	39	42	+10.67	+12.70	113.85	161.29	+135.51
43	28	31	- .33	+ 1.70	.11	2.89	- .56
44	42	41	+13.67	+11.70	186.87	136.89	+159.94
45	34	27	+ 5.67	- 2.30	32.15	5.29	- 13.04
46	24	37	- 4.33	+ 7.70	18.75	59.29	- 33.34

TABLE 1--Continued

Ss	Even	Odd	x	y	x ²	y ²	xy
47	39	40	+10.67	+10.70	113.85	114.49	+114.17
48	43	41	+14.67	+11.70	215.21	136.89	+171.64
49	21	33	- 7.33	+ 3.70	53.73	13.69	- 27.12
50	29	43	+ .67	+13.70	.45	187.69	+ 9.18
51	22	15	- 6.33	-14.30	40.07	204.49	+ 90.52
52	25	31	- 3.33	+ 1.70	11.09	2.89	- 5.66
53	27	36	- 1.33	+ 6.70	1.77	44.89	- 8.91
54	23	29	- 5.33	- .30	28.41	.09	+ 1.60
55	24	26	- 4.33	- 3.30	18.75	10.89	+ 14.29
56	27	25	- 1.33	- 4.30	1.77	18.49	+ 5.72
57	33	35	+ 4.67	+ 5.70	21.81	32.49	+ 26.62
58	24	26	- 4.33	- 3.30	18.75	10.89	+ 14.29
59	23	27	- 5.33	- 2.30	28.41	5.29	+ 12.26
60	28	35	- .33	+ 5.70	.11	32.49	- 1.88
61	35	25	+ 6.67	- 4.30	44.49	18.49	- 28.68
62	36	37	+ 7.67	+ 7.70	58.83	59.29	+ 59.06
63	49	39	+20.67	+ 9.70	427.25	94.09	+200.50
64	32	27	+ 3.67	- 2.30	13.47	5.29	- 8.44
65	31	34	+ 2.67	+ 4.70	7.13	22.09	+ 12.55
66	32	35	+ 3.67	+ 5.70	13.47	32.49	+ 20.92
67	23	21	- 5.33	- 8.30	28.41	68.89	+ 44.24
\bar{x}	<u>1898</u> 28.33	<u>1963</u> 29.30	<u>- .11</u>	<u>- .10</u>	<u>5060.85</u>	<u>4560.03</u>	<u>+3730.50</u>

*A constant factor of 70 has been subtracted from all raw scores to facilitate calculation.

$$\sigma_x = \sqrt{\frac{5060.85}{67}} = \sqrt{75.54} = 8.69 \quad \sigma_y = \sqrt{\frac{4560.03}{67}} = \sqrt{68.06} = 8.25$$

$$r_{xy} = \frac{xy}{N\sigma_x\sigma_y} = \frac{3730.50}{67(8.69)(8.25)} = .7766$$

$$r_{11} = \frac{2r'_{11}}{1 + r'_{11}} = \frac{2(.7766)}{1 + .7766} = .8743 = .87$$

TABLE 2

Data for Test-Retest Reliability *

Ss	X	Y	x	y	x ²	y ²	xy
1	84	90	-11.22	- 8.48	125.89	71.91	+ 95.15
2	77	88	-18.22	-10.48	331.97	109.83	+ 190.95
3	123	106	+27.78	+ 7.52	771.73	56.55	+ 208.91
4	112	106	+16.78	+ 7.52	281.57	56.55	+ 126.19
5	89	94	- 6.22	- 4.48	38.69	20.07	+ 27.87
6	35	71	-60.22	-27.48	3626.45	755.15	+1654.85
7	110	109	+14.78	+10.52	218.45	110.67	+ 155.49
8	48	45	-47.22	-53.48	2229.73	2860.11	+2525.33
9	136	136	+40.78	+37.52	1663.01	1407.75	+1530.07
10	103	106	+ 7.78	+ 7.52	60.53	56.55	+ 58.51
11	115	122	+19.78	+23.52	391.25	553.19	+ 465.23
12	91	96	- 4.22	- 2.48	17.81	6.15	+ 10.47
13	66	61	-29.22	-37.48	853.81	1404.75	+1095.17
14	91	89	- 4.22	- 9.48	17.81	89.87	+ 40.01
15	95	87	- .22	-11.48	.05	131.79	+ 2.53
16	85	91	-10.22	- 7.48	104.45	55.95	+ 76.45
17	126	125	+30.78	+26.52	947.41	703.31	+ 816.29
18	86	94	- 9.22	- 4.48	85.01	20.07	+ 41.31
19	95	100	- .22	+ 1.52	.05	2.31	- .33
20	120	127	+24.78	+28.52	614.05	813.39	+ 706.73
21	90	88	- 5.22	-10.48	27.25	109.83	+ 54.71
22	116	136	+20.78	+37.52	431.81	1407.75	+ 779.67
23	97	92	+ 1.78	- 6.48	3.17	41.99	- 11.53
24	99	106	+ 3.78	+ 7.52	14.29	56.55	+ 28.43
25	107	100	+11.78	+ 1.52	138.79	2.31	+ 17.91
26	76	90	-19.22	- 8.48	369.41	71.91	+ 162.99
27	99	104	+ 3.78	+ 5.52	14.29	30.47	+ 20.87
$\bar{X} =$	95.22	98.48	- .04	+ .04	13378.73	11006.73	10880.23

*A constant factor of 100 has been subtracted from all raw scores to facilitate calculation.

$$\sigma_x = \sqrt{\frac{13378.73}{27}} = \sqrt{495.51} = 22.26 \quad \sigma_y = \sqrt{\frac{11006.73}{27}} = \sqrt{407.66} = 20.19$$

$$r_{xy} = \frac{xy}{N \sigma_x \sigma_y} = \frac{10880.23}{27(22.26)(20.19)} = \frac{10880.23}{12134.59} = .8966 = .90$$

TABLE 4

Summary Table of the Analysis of Variance

Source of Variation	Sum of Squares	d.f.	Mean Square	F
Between Classes	360.49	2	180.25	.56
Within Classes	<u>43,439.67</u>	<u>134</u>	324.18	
Total	43,800.16	136		

TABLE 5

Initial PRS Score Distribution

X	f	cf	PR	X	f	cf	PR
234	1	84	100.20	189	4	40	45.60
233	1	83	99.00	188	2	36	42.00
229	1	82	97.80	187	4	34	38.40
224	1	81	96.60	186	2	30	34.80
221	1	80	95.40	185	1	28	33.00
220	1	79	94.20	183	2	27	31.20
219	1	78	93.00	182	1	25	29.40
210	2	77	91.20	181	2	24	27.60
209	1	75	89.40	180	2	22	25.20
208	2	74	87.60	179	1	20	23.40
207	2	72	85.20	178	2	19	21.60
206	2	70	82.80	175	1	17	19.80
205	1	68	81.00	174	1	16	18.60
203	1	67	79.80	173	1	15	17.40
202	2	66	78.00	172	1	14	16.20
201	1	64	76.20	171	2	13	14.40
200	2	63	74.40	168	1	11	12.60
199	5	61	70.20	167	1	10	11.40
198	3	56	65.40	164	2	9	9.60
197	2	53	62.40	163	1	7	7.80
196	1	51	60.00	157	1	6	6.60
195	2	50	58.80	154	1	5	5.40
194	1	48	57.00	152	1	4	4.20
193	1	47	55.80	151	1	3	3.00
192	2	46	54.00	148	1	2	1.80
191	2	44	51.60	137	1	1	.60
190	2	42	49.20				

TABLE 6

Data for Criterion-Related Validity

N	PRS Score	Final Grade	x	y	x ²	y ²	xy
1	164	52	-33.81	+ 1.15	1143.12	1.32	- 38.88
2	193	58	- 4.81	+ 7.15	23.14	51.12	- 34.39
3	187	53	-10.81	+ 2.15	116.86	4.62	- 23.24
4	190	32	- 7.81	-18.85	61.00	355.32	+147.22
5	204	51	+ 6.19	+ .15	38.32	.02	+ .93
6	194	64	- 3.81	+13.15	14.52	172.92	- 50.10
7	170	25	-27.81	-25.85	773.40	668.22	+718.89
8	187	63	-10.81	+12.15	116.86	147.62	-131.34
9	197	57	- .81	+ 6.15	.66	37.82	- 4.98
10	205	53	+ 7.19	+ 2.15	51.70	4.62	+ 15.46
11	230	52	+32.19	+ 1.15	1036.20	1.32	+ 37.02
12	203	50	+ 5.19	- .85	26.94	.72	- 4.41
13	192	53	- 5.81	+ 2.15	33.76	4.62	- 12.49
14	222	49	+24.19	- 1.85	585.16	3.42	- 44.75
15	202	44	+ 4.19	- 6.85	17.56	46.92	- 28.70
16	197	52	- .81	+ 1.15	.66	1.32	- .93
17	191	64	- 6.81	+13.15	46.38	172.92	- 89.55
18	184	49	-13.81	- 1.85	190.72	3.42	+ 25.55
19	221	48	+23.19	- 2.85	537.78	8.12	- 66.09
20	197	52	- .81	+ 1.15	.66	1.32	- .93
21	199	43	+ 1.19	- 7.85	1.42	61.62	- 9.34
22	219	44	+21.19	- 6.85	449.02	46.92	-145.15
23	235	53	+37.19	+ 2.15	1383.10	4.62	+ 79.96
24	192	57	- 5.81	+ 6.15	33.76	37.82	- 35.73
25	195	59	- 2.81	+ 8.15	7.90	66.42	- 22.90
26	173	42	-24.81	- 8.85	615.54	78.32	+219.57
27	212	49	+14.19	- 1.85	201.36	3.42	- 26.25
28	202	55	+ 4.19	+ 4.15	17.56	17.22	+ 17.39
29	158	58	-39.81	+ 7.15	1584.84	51.12	-284.64
30	195	48	- 2.81	- 2.85	7.90	8.12	+ 8.01
31	202	58	+ 4.19	+ 7.15	17.56	51.12	+ 29.96
32	191	49	- 7.81	- 1.85	61.00	3.42	+ 14.45
33	170	68	-27.81	+17.15	773.40	294.12	-476.94
34	169	50	-28.81	- .85	830.02	.72	+ 24.49
35	206	39	+13.19	-11.85	173.98	140.42	-156.30
36	193	51	- 4.81	+ .15	23.14	.02	- .72
37	185	43	-12.81	- 7.85	164.10	61.62	+100.56
38	196	43	- 1.81	- 7.85	3.28	61.62	+ 14.21
39	205	51	+ 7.19	+ .15	51.70	.02	+ 1.08
40	177	59	-20.81	+ 8.15	433.06	66.42	-169.60
41	174	47	-23.81	- 3.85	566.92	14.82	+ 91.67
42	221	49	+23.19	- 1.85	537.78	3.42	- 42.90
43	199	54	+ 1.19	+ 3.15	1.42	9.92	+ 3.75
44	223	42	+25.19	- 8.85	634.54	78.32	-222.93
45	201	48	+ 3.19	- 2.85	10.18	8.12	- 9.09
46	201	57	+ 3.19	+ 6.15	10.18	37.82	+ 19.62

TABLE 6--Continued

N	PRS Scores	Final Grade	x	y	x ²	y ²	xy
47	219	64	+21.19	+13.15	449.02	172.92	+278.65
48	224	48	+26.19	- 2.85	685.92	8.12	- 74.64
49	194	62	- 3.81	+11.15	14.52	124.32	- 42.48
50	212	41	+14.19	- 9.85	201.36	97.02	-139.77
51	177	40	-20.81	-10.85	433.06	117.72	+225.79
52	196	54	- 1.81	+ 3.15	3.28	9.92	- 5.70
53	203	44	+ 5.19	- 6.85	26.94	46.92	- 35.55
54	192	59	- 5.81	+ 8.15	33.76	66.42	- 47.35
55	190	56	- 7.81	+ 5.15	61.00	26.52	- 40.22
56	192	42	- 5.81	- 8.85	33.76	78.32	+ 51.42
57	208	44	+10.19	- 6.85	103.84	46.92	- 69.80
58	190	52	- 7.81	+ 1.15	61.00	1.32	- 8.98
59	190	47	- 7.81	- 3.85	61.00	14.82	+ 30.07
60	203	48	+ 5.19	- 2.85	26.94	8.12	- 14.79
61	200	52	+ 2.19	+ 1.15	4.80	1.32	+ 2.52
62	213	48	+15.19	- 2.85	230.74	8.12	- 43.29
63	228	54	+30.19	+ 3.15	911.44	9.92	+ 95.10
64	199	52	+ 1.19	+ 1.15	1.42	1.32	+ 1.37
65	205	57	+ 7.19	+ 6.15	51.70	37.82	+ 44.22
66	207	60	+ 9.19	+ 9.15	84.46	83.72	+ 84.09
67	184	46	-13.81	- 4.85	190.72	23.52	- 66.98
	<u>13249</u>	<u>3407</u>	<u>- .27</u>	<u>+ .05</u>	<u>17080.74</u>	<u>3880.34</u>	<u>-419.00</u>
\bar{X}	= 197.81	50.85					

$$\sigma_x = \sqrt{\frac{17080.74}{67}} = \sqrt{254.94} = 15.96 \quad \sigma_y = \sqrt{\frac{3880.34}{67}} = \sqrt{57.92} = 7.6$$

$$r_{xy} = \frac{xy}{N \sigma_x \sigma_y} = \frac{-419.00}{67(15.96)(7.61)} = \frac{-419.00}{8137.53} = -.05$$