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A MOTION PICTURE TEST OF
ACHIEVEMENT IN PSYCHOLOGY

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A MOTION PICTURE TEST
OF ACHIEVEMENT IN PSYCHOLOGY

By

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INTRODUCTION

In the past several years an increased amount of attention has been given to the teaching and content of the undergraduate psychology curriculum. A committee formed by the American Psychological Association and under the chairmanship of Dr. Dael Wolfle has studied the structure and objectives of the undergraduate psychology curriculum and has published (1952) its conclusions in a book entitled, Improving Undergraduate Instruction in Psychology (6).

The committee proposes three main types of liberal-education objectives for undergraduate psychology courses: 1) knowledge or content, 2) habits of thought, and 3) values or attitudes. The committee concludes that although habits and values cannot be taught directly as can psychological content, "if a student works through some of the problems of psychology with a teacher who is guided by the consideration of psychological content. . . changes in the students' ways of thinking about psychological events become almost inescapable" (6:7).

The committee further states: "Ideally the student will learn to accept and take an objective attitude toward himself and other people, but will be analytical of his

reactions and those of others in the sense of seeking understanding of relationships involved" (6:8). However, the report continues:

There are at present no means of determining whether or not a student has attained all of these objectives. Examination techniques can go far beyond measuring simple factual memory of content, but we have not yet seen an examination which adequately measures many of the values or attitudes described above (6:9).

One of the extended objectives implied by the committee report, and one that goes beyond the memory of specific factual content, would be the ability to utilize psychological principles and content in the interpretation of reality situations in normal life. The proper application of psychological knowledge in such situations requires not only factual memory, but also requires a psychological objectivity of attitude together with an empathic feeling for psychological events. One method by which such abilities might be measured is the case study test.

Johnson and Smith (3) used beginning psychology classes in an experimental study on teaching methods and as part of their study administered several tests of achievement in psychology. One of these tests was a case study test in which the behavior of a boy in school is described and then thirty interpretive statements and recommendations are made, such as "Sam feels quite insecure in social situations." The test requires the students to indicate if they agree with the statement, if the evidence presented is not sufficient, or if they

disagree. This same case study test was administered before and after a term of instruction in beginning psychology, and it was found that the improvement in mean score between the two administrations was one point. The correlations of this test with other measures of achievement in psychology, although positive, were very low. The authors conclude:

Both initially and finally the case study test is the most independent. Evidently this test measures an aspect of achievement that is not tested by conventional tests of achievement, and, furthermore a course in psychology does not add much to this aspect of achievement. Further study of this type of test might improve the criteria of achievement in psychology courses and might point up a remediable defect in teaching procedures (3:9).

In summary of the preceding remarks, then, it appears that 1) evaluation techniques different from the conventional ones are needed to measure the broader objectives of the psychology curriculum and 2) the case study type of test may possibly be a measure of some of these objectives.

The case study test, however, does not truly present a reality situation. It is a written description of a situation or incident which is actually quite removed from the experiential side of life. If one is to measure the ability of students to utilize psychological knowledge in reality situations, the more vividly real-life situations can be approximated, of course, the better. Fortunately, modern technology has developed a method by which this can be done with

facility and economy and with which the standardization requirements of group testing can still be fulfilled. This method, of course, is the motion picture and this study will describe the use of a motion picture in a test of psychological achievement and will present the results obtained with it.

One of the primary questions which must be answered is whether a reliable measure of this type can be constructed. If so, upon what is the measure dependent --- intelligence? memory of psychological content? reading ability? or something else? Does a beginning course in psychology produce improvement in whatever is being measured by such a test? Is there a sex difference in the ability to succeed on such a test? These are the questions to which this study will direct itself.

In passing it should be noted that in the education field the motion picture has been predominantly used as a teaching method and not as a testing technique. Motion picture testing is not completely without precedent, however. The Army Air Forces aviation psychology research during World War II developed several motion picture tests for the purpose of classifying air force personnel. This work is reported in a government publication edited by Gibson (1). An investigation of the Psychological Abstracts for the past ten years, however, produced no evidence of the use of motion pictures as a testing technique of psychological achievement.

THE INVESTIGATION

The Motion Picture Test. Of Skates and Elephants (4), a 16 mm black and white sound film with a showing time of fifteen minutes, was selected¹ as having appropriate content for the construction of test questions which could be asked of students in a beginning course in psychology. The film is an episode extracted from a feature-length motion picture entitled Our Vines Have Tender Grapes and stars Margaret O'Brien and Edward G. Robinson. It specifically deals with a discipline problem involving father and daughter and skilfully depicts the interaction of personalities from the initial conflict to its final resolution. A 28-item objective test (Appendix A) based on the film content was constructed; the items do not require the memory of specific factual content. The items are multiple-choice questions with five alternatives for each item.

The ability to succeed on this test does not entirely depend upon memory of psychological content, but also involves the use of a special skill, whatever it may be, to apply psychological knowledge to real-life situations as

¹The film selection was made by Dr. Donald M. Johnson, who also constructed the test questions used with the film.

portrayed in the motion picture. This test attempts to measure an additional aspect of achievement in psychology which is otherwise not touched upon by conventional examinations in psychology.

Other Measures. In addition to the motion picture test scores for each subject, other test scores were used in this study: 1) The American Council on Education Psychological Examination (ACE) was used as a measure of general intelligence. The Michigan State College Board of Examiners reports all ACE scores as derived scores, using a range of 1 through 10. Therefore, the derived scores for the total test, rather than the raw scores, were used in all calculations involving this test.

2) The derived score for the comprehension subtest of the Michigan State College Reading Examination was used as a measure of reading ability.

3) A 90-item objective (multiple choice and matching) departmental final examination for the beginning psychology course was used. Raw scores were used in all calculations involving this test.

Experimental Design. The motion picture test was administered to a total of 112 subjects in two separate classes of the beginning course in psychology. The test was given as

a part of their regular final examination in the course. This group will hereafter be referred to as the post-course group.

The test was also administered to a total of 129 subjects in three separate classes during the first week of the beginning psychology course and before any significant amount of instruction was given. This group will hereafter be referred to as the pre-course group. Scores for subjects taking the course for the second time were discarded.

All administrations of the test were in the same room under similar conditions. The following instructions were given to all groups:

You will be shown a 15-minute movie excerpt from a feature film of several years ago called, "Our Vines Have Tender Grapes." In it you will see Margaret O'Brien as a little girl and Edward G. Robinson. At the end of the movie you will be given a short objective test based on the movie you are about to see. The test is not a test of memory so you will not have to try to remember little details in the movie, and you needn't take notes. The test will ask some psychological questions about what takes place in the movie, so all that you need to do is sit back and watch the movie and enjoy it. I will pass out the tests after the movie.

Subjects. In order to determine the effect of instruction in a beginning psychology course on the results of this test, it was necessary to use different subjects in the pre-course and post-course administrations because only one form of the test was constructed. Even though the pre and post-course administrations involved different subjects, it

is still possible to analyze the test results as if they were obtained from the same subjects. This is possible because of the comparability of the two groups of subjects, most of whom were at the sophomore level and all of whom had had no previous course in psychology. Table 1 presents the sex membership of the two groups and shows that a chi square analysis reveals no significant sex difference between the two groups.

TABLE 1

CHI SQUARE ANALYSIS OF SEX MEMBERSHIP OF
PRE-COURSE AND POST-COURSE TEST GROUPS

	Men	Women	Total
Pre-Course Group	67	62	129
Post-Course Group	54	58	112
Total	121	120	241
Chi Square = .331 (not significant)			

Table 2 presents additional data upon which the assumption of the comparability of the pre-course and post-course groups is based. The table demonstrates that there was no significant difference between the two groups in general intelligence as measured by the ACE; and there was no significant

difference between the two groups in reading ability as measured by the reading test.

TABLE 2

COMPARISON OF PRE-COURSE AND POST-COURSE GROUPS ON
DERIVED SCORE MEANS FOR INTELLIGENCE AND READING ABILITY

<u>Intelligence:</u>	Mean	S.D.	SE of Mn.	SE of Diff.	t
Pre-Course	5.57	1.90	.21	.28	.478
Post-Course	5.44	1.62	.18		n.s.*
<hr/>					
<u>Reading:</u>					
Pre-Course	5.77	1.70	.19	.27	.744
Post-Course	5.97	1.64	.19		n.s.*

*n.s. = not significant

RESULTS AND DISCUSSIONS

Reliability. The Pearsonian odd-even reliability coefficients, with the Spearman-Brown correction, for the motion picture test are presented in Table 3.

TABLE 3

PEARSONIAN RELIABILITY COEFFICIENTS FOR THE MOTION PICTURE TEST

	Pre-Course	Post-Course	Combined Groups
Pearsonian r's	.383	.685	.550

Although the reliability coefficients are not as high as would be desired for use in the evaluation of individual students or for the prediction of success in psychology, they are sufficiently high to merit the use of this test in situations where knowledge of group results is adequate, such as in determining the effects of various teaching methods on the test results. It is generally difficult to obtain high reliability coefficients when the number of test items is small. One of the methods by which the reliability of this test could be increased would be to lengthen the test, although this would be quite difficult to do because of the restricted content of the motion picture upon which this particular test is based.

The reliability of this test could be further increased if the internal consistency of the test were improved by a screening of the individual test items. Guilford (2) states that the internal consistency is greater when the items are of equal difficulty and when the proportion passing an item is .50. These factors allow the item intercorrelations and the variance of items to be the greatest. The difficulty of each item (percentage passing) is reported in Appendix B, and this information could be used in a later refinement of the test should this be desired.

Since the key to internal consistency is to improve the item intercorrelations, and the best index of item intercorrelation is the correlation of an item with total score on the test, another method by which the internal consistency reliability could be improved is to select those items which correlate highest with the total score. Guilford (2) recommends the use of the phi coefficient as one of the most satisfactory indices of item consistency. Phi coefficients were calculated for each item through use of the abac in Guilford (2:503). The upper and lower twenty-five per cent of the post-course group were used in this calculation. These phi coefficients are reported in Appendix B.

Test Comparisons: Pre and Post-Course. Table 4 presents the test results of the pre-course and post-course groups. Table 5 shows the distribution of scores for the two groups.

TABLE 4

SIGNIFICANCE OF DIFFERENCES IN TEST RESULTS BETWEEN
PRE-COURSE AND POST-COURSE GROUPS

	Mean	Median	S.D.	SE of Mn.	SE of Mn.Diff.	T
Pre-Course	18.70	18.59	2.47	.219		
Post-Course	19.87	20.03	2.99	.284	.359	*3.25

*significant beyond .5 per cent level

Although the improvement in mean score following instruction in a beginning course in psychology was only slightly more than one point, the difference was found to be very significant. Even so, it can be generally concluded that the training acquired in the beginning psychology course affects only slightly the ability measured by this type of test.

It is interesting to note that the case study test used by Johnson and Smith (3) and cited earlier in this paper also showed a very small improvement under similar pre-course and post-course conditions. It seems likely that both the case study test and the motion picture test of this study

measure similar abilities which are not very much affected by beginning psychology courses as they are presently taught. The implication of this finding would be to experimentally vary teaching methods to determine if and how the ability to succeed on such tests could be increased.

TABLE 5

DISTRIBUTION OF SCORES ON THE MOTION
PICTURE TEST FOR THE TWO GROUPS

Score: No. Right	Frequency Pre-Course	Frequency Post-Course
26	0	2
25	1	2
24	2	5
23	3	16
22	11	10
21	14	13
20	18	17
19	17	14
18	25	9
17	17	10
16	8	6
15	7	4
14	4	2
13	1	0
12	0	0
11	0	1
10	1	0
9	0	1

Although a course in psychology may not produce much improvement in a test of this type, one may wonder how the precourse group attained scores which were so very much higher than expected by chance (a chance score would be about 5 to 6) without having had any formal training in psychology. Weitzman (5) in a study of the misconceptions of entering college freshmen made an observation which may be relevant to this question. He states that

. . . . only two per cent of the freshmen knew what is meant by conditioning, whereas 37 per cent knew the meaning of sublimation, with 55 per cent selecting the correct definition for projection, and 87 per cent for introvert. This would seem to reveal the effect of the greater publicity given to analytic concepts in the popular writings on psychology (not to mention the even more noticeable motion picture and radio penchant) (5:225).

Because the content of the motion picture and therefore of the test dealt primarily with manifestations of personality, it is probable that the presumably naive and psychologically untrained sophomores were not so naive nor untrained.

Correlations with Other Measures. The motion picture test scores of the post-course group were correlated with several other test measures: 1) an intelligence test (ACE), 2) a reading test and 3) the final examination in psychology. All of the correlations are Pearsonian product-moment coefficients; they are presented in Table 6 and are given separately for each sex as well as for the total group. All correlation coefficients are positive.

TABLE 6

CORRELATIONS BETWEEN MOTION PICTURE TEST SCORES
OF THE POST COURSE GROUP AND THREE OTHER TESTS

	Men	N for Men	Women	N for Women	Combined Groups
Intelligence	.226 n.s.*	31	.360 s.	46	.227 s.
Reading	.273 n.s.	31	.398 v.s.	46	.351 v.s.
Final Exam	.524 v.s.	54	.406 v.s.	58	.472 v.s.

*n.s. - not significant

s. - significant, 5 per cent level

v.s. - very significant, 1 per cent level

All correlations for the combined groups are significantly different from zero and all are positive; it is apparent that success on the motion picture test is partially related to success on the other three tests. The highest correlations were found between the motion picture test and the final examination, and they indicate that although a moderate relationship exists between the two measures they still do not tap completely identical abilities. Intelligence does not appear to be very important factor for success on a test of this type.

Sex Differences. The scores on the motion picture test were also analyzed for sex differences. Table 7 compares the mean scores for each sex in both test groups and

shows that women in the post-course group did significantly better than the men; the difference in the pre-course group, although in favor of the women was not significant. No reason for this observed sex difference is apparent, although it may have been that because the motion picture dealt with a child-parent conflict the women were more highly motivated to succeed in an area which they may consider their eminent domain. Another possibility, however, is that women may have more ability in the general area of personal relationships.

TABLE 7

COMPARISON OF MOTION PICTURE TEST SCORES
OF MEN AND WOMEN IN BOTH TEST GROUPS

Pre-Course:	Mean	S.D.	SE of Mn.	SE of Diff.	t
Men	18.40	2.54	.31		
Women	19.02	2.39	.31	.44	1.409*

Post-Course:					
Men	19.12	3.27	.45		
Women	20.55	2.53	.34	.56	2.549**

*not significant

**significant at five per cent level

Suggestions for Further Research. The results of this study indicate that it is possible to construct a reliable test of this type and that such a test measures an ability which is at least partially different from that measured by conventional examinations in psychology. Further research should first attempt to increase the reliability of such a test, and as a starting point it may be profitable to refine the test used in this study by selecting those items which best meet the internal consistency requirements. Appendix B provides this information. The reliability of this test could also be improved if the number of items were increased.

Another approach to the reliability problem would be to construct an alternate form of this test to be used in a test-retest situation. It would also be desirable to construct additional tests based on other motion pictures to determine whether comparable results are obtainable with different motion picture content.

When such additional information concerning the reliability of such a test is available, it would be desirable to determine whether success on such a test is related to any particular interest, ability, or trait. For example, some relationships may possibly be found with measures of

empathy, social awareness, extroversion, or sociability; others could be added to this list. If some relatively strong relationships can be found, it might shed light on the specific nature and components of the ability to succeed on such a test.

Another important aspect of research with this type of test would be to determine if it is possible to teach students the skills needed to succeed on this test. This would require experimentation with different teaching methods and a comparison of their effects upon the results obtained from the test. The outcome of such research might lead to a considerable change in the teaching of psychology.

SUMMARY

Investigators of the undergraduate psychology curriculum have suggested that new tests of achievement in psychology are needed to measure the aspects of achievement which go beyond the memory of psychological content. One such aspect is the ability to appropriately apply psychological knowledge to the events of real life. This study directed itself to the development of such a measure of achievement and used the motion picture as the method by which the reality presentation of real-life events could be maximized and the standardization requirements of testing could still be met.

A 28-item objective test based on the content of a motion picture was constructed. The motion picture was a 15-minute black and white sound film that dealt with a parent-child conflict and its resolution. The test did not require memory of factual content but rather asked psychological questions concerning events and interpersonal relationships portrayed in the film. The procedure was to show the film and then administer the test.

This motion picture test was administered to 129 sophomore students in the first week of a beginning psychology course and to a different group of 112 sophomores in the last

week of the beginning psychology course. The two samples were shown to be comparable in sex membership, intelligence and reading ability. Other test measures obtained from the subjects were intelligence scores (ACE), reading scores and final examination scores in the psychology course.

The results of this study indicate that it is possible to construct a moderately reliable test of this type; add-even product-moment reliability coefficients were calculated. A comparison of the mean scores of the two groups shows that although the mean score of the post-course group is significantly higher than that of the pre-course group, the amount of improvement on this test following instruction in psychology is very small. The implication of this finding is that the beginning psychology course does not effectively teach the skills involved in a task of this type. The correlation coefficients between the film test and the other measures were all significantly positive but small; the highest correlation coefficient was found to be with the final examination.

Some sex differences were found and they were briefly discussed. Suggestions for further research in this area were also made.

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APPENDIX A

MOTION PICTURE TEST ITEMS

*correct answers

1. Why did boy and girl fight?
 - *1. Both wanted the skates at the same time.
 2. Both wanted to impress adults.
 3. Each was afraid of the other.
 4. There was not enough room to play.
 5. They were imitating their parents.
2. Why did boy say: "When do I get my turn?"
 1. A form of latent aggression.
 2. To assert his masculinity.
 - *3. Expectation based on previous training.
 4. Fear of failure.
 5. Emotional reaction to frustration.
3. Why did girl say: "I was going to give you a turn, but now I won't"?
 1. To hide her anxiety.
 2. To soften his anger.
 3. Displacement of aggression.
 4. To satisfy parents.
 - *5. Rationalization for refusal.
4. When boy called girl names, this illustrates:
 - *1. A substitute form of aggression.
 2. Identification with male adult.
 3. Reaction to latent anxiety.
 4. Desire to play feminine role.
 5. Fear of failure as skater.
5. Why did girl push boy down?
 1. Desire to play masculine role.
 - *2. Reaction to frustration.
 3. Emotional conditioning.
 4. Identification with female adult.
 5. Fatigue from skating too long.
6. Why did mother ask father to handle the boy-girl conflict?
 1. Mother is evading reality
 - *2. It is the father's social role.
 3. Boy would be more susceptible to male control.
 4. Mother was too busy.
 5. Girl identifies with father.

7. Why did boy call girl selfish?
 1. Automatic reaction to anxiety.
 2. Substitution of one form of aggression for another.
 3. Displacement of aggression.
 - *4. Projection of his guilt about conflict.
 5. So he would not be punished.
8. Why was girl unable to sleep when she went to bed?
 1. Fear of punishment.
 2. Fear of boy's aggression.
 - *3. Anxiety over loss of father's affection.
 4. Expectation of bad dreams.
 5. After-effect of emotional excitement.
9. When father tells girl to go back to bed, he is:
 - *1. Defending his disciplinary action
 2. Planning for her to forget the incident.
 3. Testing reality
 4. Reassuring mother that the conflict is settled.
 5. Pretending that his daughter is a son.
10. Why did father take girl to circus?
 1. He hoped there would be a skater at the circus.
 2. He knew she would not sleep unless he did something.
 3. He feared she would hate the boy.
 - *4. He felt guilty about punishing her.
 5. He wanted to show mother who is the master of the house.
11. Why was girl so anxious while waiting for the circus to come in?
 1. She was afraid the boy would be there.
 - *2. She was afraid her father would reject her again.
 3. She secretly wanted to be like her father.
 4. Unconsciously she wanted to run away.
 5. Her fear of the boy was displaced to animals.
12. Which of these is the best description of mother's role in circus incident?
 1. Frightened victim of unconscious hate.
 2. Secret aggressor against father.
 3. Secret aggressor against daughter.
 4. Authoritarian leader
 - *5. Behind-the-scenes leader.
13. Which of these is the best description of father's role in the family?
 1. Power behind the throne.
 2. Laissez-faire leader.
 3. Mother substitute
 4. Democratic leader
 - *5. Authoritarian leader

14. Why did father deceive girl about paying to have elephant perform?
 - *1. To maintain his role as father.
 2. To maintain parental control.
 3. To prevent repetition of incident.
 4. To keep secret from mother.
 5. To teach her not to lie.
15. Which is the best one-word characterization of the girl's personality as it is developed in this film?
 1. Aggressive
 2. Selfish
 3. Shy
 4. Peculiar
 - *5. Sensitive
16. The girl's wish to be kissed goodnight illustrates:
 1. Homeostasis.
 2. Repression
 - *3. Symbolic reward
 4. Instrumental conditioning
 5. Primary drive
17. Which incident gives best insight into relations between mother and father?
 - *1. Mother says that circus is coming.
 2. Father bargains with truckdriver.
 3. Mother tells father that he gave girl the skates.
 4. Mother tells father that she is busy.
 5. Increase in girl's interest in social activities.
18. The most important personality change during the action of the film is:
 1. Decrease in father's inconsistency
 - *2. Increase in girl's feeling of security
 3. Increase in father's dominance.
 4. Increase in mother's freedom from worry
 5. Increase in girl's interest in social activities.
19. The film assumes that parents' values are those of:
 1. Father's occupational group
 2. Minority-group families
 3. Low-income families
 - *4. Middle-class United States
 5. Progressive education

20. When was father's concept of himself threatened most?
1. When trainer showed that he could make the big elephant perform tricks.
 2. When elephant picked up girl in its trunk.
 - *3. When girl said she would go to bed without supper.
 4. When truckdriver asked for money.
 5. When mother told father to settle the conflict between boy and girl.
21. The elephant mastered his tricks by:
1. Imitation
 - *2. Rewarded practice
 3. Reasoning
 4. Incidental learning
 5. Simple conditioning
22. The girl's interest in the circus was probably acquired by:
1. simple conditioning
 2. rationalization
 - *3. incidental learning
 4. reasoning
 5. compensation
23. The character in the film that best illustrates a stereotype is the:
1. Father
 2. Mother
 3. Boy
 - *4. Truckdriver
 5. Girl
24. The principal motive shown by the father was:
1. To get away from home.
 2. To evade reality
 3. To dominate his wife
 4. To impress the boy
 - *5. To be a good parent.

Match the term on the left with the incident on the right that illustrates the term.

Answer

- | | | |
|---|-----------------------------------|----------------------------------------------------------|
| 3 | 25. Effect of emotion on judgment | 1. Girl seeks father's love. |
| 1 | 26. Social motive | 2. Truckdriver uses slang terms for money. |
| 5 | 27. Transfer of training | 3. Father gives skates to boy. |
| 4 | 28. Energizing effect of emotion. | 4. Girl jumps up and down while waiting to see elephant. |
| | | 5. Elephant performs on street as it does in arena. |

APPENDIX B

ITEM DIFFICULTIES FOR THE PRE-COURSE AND POST-COURSE
GROUPS AND PHI COEFFICIENTS*BASED ON POST-COURSE RESULTS

*Note: a phi coefficient of .277 is needed for significance at the 5 per cent level of confidence, and a phi coefficient of .364 is needed for significance at the one per cent level.

Item #	Pre-Course Percentage Passing	Post-Course Percentage Passing	Phi Coefficients
1.	88	87	.25
2.	55	52	.44*
3.	88	82	.37*
4.	84	95	.29
5.	69	83	.50*
6.	7	10	.21
7.	65	70	.40*
8.	90	96	.10
9.	95	96	.20
10.	99	100	.00
11.	74	71	.43*
12.	88	81	.18
13.	26	31	.20
14.	57	65	.50*
15.	91	94	.24
16.	40	50	.48*
17.	61	55	.56*
18.	82	85	.32
19.	22	19	.37*
20.	61	66	.33
21.	63	62	.38*
22.	47	54	.56*
23.	47	76	.42*
24.	84	88	.28
25.	69	73	.37*
26.	33	54	.48*
27.	94	93	.30
28.	91	96	.25

*significant at one per cent level.

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