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AUTHOR Rosenthal, Harriet P.
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ABSTRACT

The primary purpose of this study was to replicate and extend research in the area of teachers expectancies toward an adult education population in a remedial course, the General Technical Review Course at a military base in the Southeastern United States. The students, 68 blacks, 27 whites, and 12 Spanish speakers were initially administered an achievement and an I.Q. test. Teachers (three white females and one black male) were informed that the tests were designed to identify "academic spurters." Approximately 20 percent of the students were randomly designated as "spurters" and the teachers given the "results." At the end of the course, students were again tested and teachers completed an evaluative rating form for each student. For the students, the results indicated that the self-fulfilling prophecy may have operated for the white experimental group but not for the nonwhite experimental group. For the teachers, analyzing the data by high-low achievement within race indicated that teachers credited white students who achieved (they had more personality, they studied better, and they were more personable), but black and Spanish-speaking students who achieved were not credited (the nonwhite high achievers were not differentiated from the nonwhite low achievers). A possible explanation is that "self-induced" teacher biases, prior expectancies based on race, were operating. (Author/JR)

THE EFFECT OF TEACHER EXPECTANCY UPON THE ACHIEVEMENT AND INTELLIGENCE TEST SCORES OF ADULT STUDENTS

A paper presented by Dr. Harriet P. Rosenthal

at the Adult Education Research Conference

St. Louis, Missouri

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INTRODUCTION

The teaching-learning process in adult education settings has been a subject of concern and investigation. While much of the research has centered on the style of teaching, the setting of behavioral objectives, or the characteristics of the learner; few studies have looked at the teacher's expectations of the adult student as an influence upon the learning. The now classic study of Rosenthal and Jacobson (1968a) examined the effect of teacher expectation upon young school-age children. By experimentally changing a teacher's expectation regarding student academic potential, a significant gain in I.Q. score over a one year period for randomly selected first and second grade students was reported although no significant gain was produced for like students in grades three through six. This study has had a far-reaching effect in educational circles. "Teacher expectancy" or the "self-fulfilling prophecy" has since been touted as a universal phenomenon; yet, statistical analysis of the Rosenthal and Jacobson study has been seriously questioned (Barber and Silver, 1968b; Thorndike, 1968; Thorndike, 1969; Jensen, 1969; Snow, 1969). Numerous replication and extension studies have not elucidated the matter. While studies produced conflicting results, and further investigation is needed for clarification, the construct of teacher expectancy gained wide acceptance. Whether the self-fulfilling prophecy is an illusion or a fact still needs further investigation.

Purpose of the Study

The primary purpose of this study was to replicate and extend research in the area of teacher expectancies to an adult education population that was remedial in nature. Specific areas of investigation were: (1) an examination of the influence of teacher expectancy upon the achievement scores of "special" students; (2) an examination of the influence of teacher expectancy upon the intelligence scores of "special" students; and (3) an examination of teacher affective components toward "special" students.

Hypotheses

From a review of the literature and the basis of the conceptual framework, the following hypotheses were derived:

Hypothesis I: Altering teacher expectancies will result in higher posttest I.Q. scores, after adjusting for pretest scores, for the experimental group as compared to the control group and as measured by a standardized group I.Q. test.

Hypothesis II: Altering teacher expectancies will result in higher posttest reading scores, after adjusting for pretest scores, for the experimental group as compared to the control group and as measured by a standardized group achievement test.

Hypothesis III: Altering teacher expectancies will result in higher posttest arithmetic computation scores, after adjusting for pretest scores, for the experimental group as compared to the control group and as measured by a standardized group achievement test.

Hypothesis IV: Altering teacher expectancies will result in higher posttest arithmetic problem solving scores, after adjusting for pretest scores, for the experimental group as compared to the control group and as measured by a standardized group achievement test.

Hypothesis V: Altering teacher expectancies will result in higher and more positive overall teacher ratings for the experimental group, as compared to the control group, and as measured by a teacher rating scale.

METHODOLOGY

Subjects

The population consisted of all students enrolled in the General-Technical (G.T.) Review Course at a military base in the Southeastern section of the United States during the May 13 through May 24, 1974 session. A total of 107 men, with a mean age of 22.2 years, constituted the population. Sixty-eight subjects were black, 27 were white, and 12 were of Spanish-American descent. All subjects were included in the teacher rating analysis. Data from 17 of the subjects were excluded from achievement and I.Q. score analyses since they were absent for the posttest.

The G. T. Review Course was a two-week remedial course designed to improve a military student's G.T. score which was below minimum standards. Minimum scores were a prerequisite for re-enlistment, promotion, and entrance into military schools (i.e., flight training school, technical schools, Officer Candidate School). Classes were eight hours a day, five days per week, with morning devoted to vocabulary improvement and afternoons devoted to remedial arithmetic. The first and last days of the session were devoted to testing by the military.

Students were divided into four classes with a teacher assigned to each class. Three teachers were white female; the fourth was a black male. All teachers had state-certified teaching certificates.

Overview of Design

The study was a randomized one factor design with two levels of the factor: presence or absence of induced teacher expectancy for "academic spurting." On the second day of class, subjects were tested with an achievement and an I.Q. test. Teachers were informed that the purpose of the testing session was to establish state norms on a national test predicting adult "academic spurters." Following testing, approximately 20 per cent of the students within each classroom were randomly

assigned to the "academic spurting" condition. Teachers were individually given the "test results." After 40 hours of classroom instruction following the manipulation, the I.Q. test was readministered, as was an alternate form of the achievement test. Teachers then filled out an evaluative rating form for each student. In order to verify that teachers were unaware of the true intent of the testing, manipulation check questionnaires were administered.

Instruments

The Adult Basic Learning Examination, Level II (ABLE) was the test instrument used to measure achievement. Level II of ABLE was designed to measure the general educational level of adults who achieved at a fifth to eighth grade level. The subtests of reading, arithmetic computation, and arithmetic problem solving were used. All subtests were without time limits.

The Standard Progressive Matrices, Sets A, B, C, D, and E was the intelligence test that was used. The test is nonverbal and attempts to measure intellectual functioning via various forms of perceptual reasoning.

New professionally printed covers replaced the ABLE and the Standard Progressive Matrices covers. The "new" ABLE cover read: The Princeton Test of Educational Thematic Perception, Section I, while the "new" cover of the Standard Progressive Matrices read: The Princeton Test of Educational Thematic Perception for Adult Basic Education Students, Section II. The tests were commonly referred to in front of teachers and students as The Princeton.

The Teacher Rating Sheet for Individual Students was a 28 item Likert-type scale devised by the researcher.

Procedure

One month prior to the start of four new General-Technical (G.T.) Review classes, the Assistant Director of the Education Center was contacted and sent an explanation (see Appendix A) of the research project. Permission was granted to use the G.T. Review classes in the research project. No one at the Center, other than the Assistant Director, knew the "true" purpose of the project or the testing sessions.

One week before classes began, the Assistant Director of the Center informed the G.T. Review Supervisor that classes would be involved in a state project to validate test norms; measurement specialists from North Carolina State University would be testing classes. The Supervisor was handed the following written rationale:

> The Princeton Test of Educational Thematic Perception for Adult Basic Education Students
>
> A measurement specialist from North Carolina State University will be coming into your classroom to validate state norms for the widely used test: The Princeton Test of Educational Thematic Perception for Adult Basic Education Students. This test was developed at Princeton, New Jersey in order to identify those functionally illiterate adults who would profit greatly from formalized Adult Basic Education classroom instruction. The test identifies those adults who are likely to show an unusual forward spurt of academic progress, even adults who have not previously functioned well academically. These spurts can and do occur at any level of academic and intellectual functioning.
>
> This test has been tremendously successful in identifying "spurters" (i.e., adults who are likely to show a sudden academic growth). It has been widely acclaimed by teachers and administrators alike as a tool to successful programming. It is now being used in some 30 states in the United States, and the validity and reliability have been extremely high. As a part of the procedure in North Carolina, we are establishing state norms and further validating the test. The test has been so constructed that not every one of those identified as spurters will exhibit the effect, but those identified will show more significant academic growth in learning than those not identified as spurters.
>
> At this time we cannot discuss the test or an individual score with either teachers or students. Teachers will be notified which students, if any, the test identifies as potential academic spurters. Naturally, this information must be kept confidential. Thank you for your cooperation.
>
> Upon completion of test validation, participating classes will be advised of the test results.

The supervisor distributed copies of the rationale to the four G.T. Review teachers and proceeded to establish testing schedules.

To make certain that the teacher was well aware of the "spurting" manipulation, she (he) was given another copy of the test rationale (see above) at the beginning of the testing session. Testing was conducted by the researcher and another graduate student: each tested one class in the morning and one class in the afternoon. All testing procedures were well-rehearsed and standardized.

At the start of the testing, teachers introduced the "measurement specialist" to the class and then retired to the teacher's lounge. Even though no teacher was asked to leave the room during testing, all teachers left after attendance was taken and introductions were made. The tester said to the class:

> Hello. My name is _____. I am from North Carolina State University, and I am here to do research concerning a test that is used with students like yourselves throughout the United States.
>
> I have been informed that you are quite excited about your classes. Because of your high interest, your class was selected as one of only 20 in all of North Carolina to participate in this research.
>
> I am asking for your cooperation in helping us in this research. The scores will be used only in our research at N.C. State. They will be kept confidential. We will not show them to your teacher or to anyone else in the Center. Again, these tests are for research and can be of great help to others like yourselves throughout North Carolina and the United States. I know you will do your best.
>
> We hope this will be the only time we will have to give these tests although we may want to return once more to have comparison scores later.
>
> I am grateful for your cooperation. I hope these tests will be fun and a pleasant experience. At your next class session, you will return to your regular activities.

At this point, testing was conducted which lasted approximately three and one-half hours. Each tester administered the Standard Progressive Matrices first and then alternated in the afternoon (or

morning) session and administered the Standard Progressive Matrices last. This procedure was executed so that test order would not have an effect upon the test results.

At the end of the testing session, students were thanked for their time and cooperation. The teacher came back into the classroom and was thanked by the tester for her (his) cooperation. Casually, the tester asked:

Oh, did you ever have any of these students before?

No teacher taught any of the students previously; therefore, prior teacher expectancy was minimized.

The testers left the Center to randomly and blindly assign 20 per cent of the students in each class to the experimental condition. Each tester randomly assigned 20 per cent of the students from those classes that she (he) had not tested and wrote manipulation letters for those individual classes. Manipulation letters were written on stationary with the letterhead: NORTH CAROLINA STATE UNIVERSITY, DEPARTMENT OF ADULT AND COMMUNITY COLLEGE EDUCATION.

Teachers from morning-tested classes were given the manipulation letter late in the afternoon of the same day, while teachers from afternoon-tested classes were given the manipulation letter the next morning before the start of class. The researcher approached the teacher with a tremendous stack of computer output sheets in her hand, and said:

> I just got back the results of the test, and I thought that perhaps you might like to see them.

She gave the teacher the following letter and left.

> Dear _____:
>
> Thank you for letting your class participate in the research program to establish state norms and further validate The Princeton Test of Educational Thematic Perception for Adult Basic Education Students.
>
> This national test developed at Princeton, New Jersey has been widely acclaimed by teachers and administrators alike as a tool to successful programming. It has had phenomenal success in identifying "spurters," those adults who have not previously functioned well academically but who are likely to show a sudden academic spurt.

You may be interested to know that our testing has identified the following students from your class who are likely to show significant academic growth:

_____ _____

_____ _____

_____

Thank you for all your fine support.

Sincerely,

Harriet P. Rosenthal
Project Director

Within the next few days, the Assistant Director of the Center informed the G.T. Review Supervisor that it was necessary to further validate alternate forms of The Princeton Test of Educational Thematic Perception for Adult Basic Education Students. Testing schedules were established.

After 40 hours of class instruction following the manipulation, posttests were administered. Testers were unaware of which students in their class comprised the experimental group. The testing procedure was almost identical to the pretest procedure. At the start of the testing, the "measurement specialist" gave the Teacher Rating Sheet for Individual Students (see Appendix B) to the teacher and said:

> We would like you to fill out these individual student evaluations. It will only take you a few minutes for each one. You are the most qualified person to evaluate the student, and we need this data to further validate the test scores.

At this point, the teacher again introduced the tester to the class, and then retired to the teacher's lounge. The tester said to the students:

> Good morning (afternoon). As you probably remember, I am _____ from North Carolina State University. I am back here today because it is necessary that we have comparison test scores. Many of you performed extremely well on the previous set of tests. I know you will try as hard today.

> I must remind you again that these tests are for research purposes only. Your test scores will be kept confidential. We will not show them to your teacher or to anyone else in the Center. Your efforts are greatly appreciated by educators throughout North Carolina and the rest of the United States.
>
> We are truly grateful for your cooperation. You are familiar with the test format so I know you will do your best. Thank you. At the end of the testing session, you will return to your regular activities.

At this point, testing was conducted which lasted approximately three and one-half hours. The Standard Progressive Matrices was readministered to all students while an alternate form of the Adult Basic Learning Examination was administered. The two "measurement specialists" each tested the same classes in the same order as they did for the pretest. For student convenience, the order of test presentation was identical to the pretest.

At the end of the testing session, students were thanked for their cooperation. The teacher returned to the classroom with the Teacher Rating Sheet for Individual Students completed. Student attendance and attrition records were then recorded by the tester. The teacher was thanked for her (his) time and cooperation, and the tester left.

After all classes were tested and all dependent measures were secured, the researcher visited each teacher individually and attempted to ferret out any suspicions concerning the test manipulation. At this time, the researcher said:

> Oh, I forgot to give you this sheet, but would you mind filling it out? We would like to know your honest feelings about the test and the testing procedure.

The researcher handed the manipulation check (see Appendix C) to the teacher. The questions were intended to serve as a check on the teacher expectancy manipulation and on any suspicions regarding the true nature of the experiment.

Data Analysis

All tests were scored and double checked by individuals who were blind to the condition in which the subject participated. Only after scoring was completed, were envelopes opened which contained the names of the experimental group for each class. Names of students and teachers were coded in order to preserve anonymity.

Manipulation checks revealed that all teachers were unaware of the true purpose of the testing; therefore, data from all classes were utilized.

Because raw scores on the alternate forms of the reading, arithmetic computation, and arithmetic problem solving tests were not comparable, they were converted into grade score equivalents and utilized for data analysis. Raw scores for the I.Q. tests were used since the same test was administered as a pre- and posttest. The .05 level of significance was established for all analyses.

Analyses of covariance using the regression procedure were carried out on the dependent measures of intelligence and achievement test scores. The pretest score for each of these dependent variables served as the covariate so that initial differences in ability were controlled. Unless initial differences were taken into account, the effect of the independent variable could have been obscured or spuriously enhanced.

Teacher ratings were summed, made a continuous variable, and examined through analysis of variance. Ratings were also grouped into three category clusters: arithmetic-reading ability, study habits, and personality attributes.

Difference scores between pre- to posttest administration of the dependent achievement measures (i.e., reading, arithmetic computation, and arithmetic problem solving) were computed for each subject; subjects were then classified into high-low achievers for each of these measures.

RESULTS

Hypotheses I - IV were not confirmed since there were no significant differences between the experimental and the control conditions in intelligence, reading, arithmetic computation, or arithmetic problem solving

posttest grade scores. Since the raw scores for intelligence did not appear to fluctuate from pre- to posttest, post hoc analyses were performed only with the achievement dependent measures.

When conditions were collapsed over treatments, analyses indicated that race was not a significant source of variance for any of the three achievement dependent variables. Thus white, black, and Spanish-American subjects seemed to achieve equally well on the posttests.

Internal analyses were performed and the dependent variables were examined by race for each condition. In the experimental condition (Tables 1 and 2) white students seemed to fare better in arithmetic computation ($F = 2.99605$, $df = 2, 17$, $p < .10$) than black or Spanish-American students while in the control condition there were no significant differences between the races nor were any trends indicated.

When the dependent variables were examined by race across conditions, there were no significant differences in achievement between the black control and the black experimental subjects (Table 3) although Spanish-American control subjects seemed to fare somewhat better in arithmetic problem solving ($F = 3.78$, $df = 1, 7$, $p < .10$) than their counterparts (Tables 3 and 4). But white subjects who were the object of a teacher-induced positive expectancy performed significantly better (Tables 3 and 5) in arithmetic problem-solving than white control subjects ($F = 4.30$, $df = 1, 22$, $p < .05$).

When the adjusted means of the reading, arithmetic computation, and arithmetic problem-solving posttests were combined and averaged to provide a measure of overall performance, white experimental subjects appeared to perform equal to or somewhat better than white control subjects (Figure 1). Yet, it appeared that black and Spanish experimental subjects performed less well than their respective counterparts. Furthermore, when the experimental condition alone was noted, white subjects seemed to perform somewhat better than nonwhite subjects.

Table 1. Mean scores of experimental group adjusted for pretest

Race	N	Reading	Arithmetic Computation[a]	Arithmetic Problem Solving
Black	13	7.6170	6.4362	7.0976
Spanish	3	7.5692	6.9800	6.3367
White	5	7.9943	7.4379	7.0441

[a] $p = .07$.

Table 2. Analysis of variance, arithmetic computation posttest for the experimental condition

Source of Variance	DF	SS[a]	MS	F Value
Race (Black, Spanish, white)	2	3.79458	1.44729	2.99605[b]
Pretest	1	35.19040	35.19040	55.56983[c]
Error	17	10.76549	0.63326	
Corrected total	20	48.83238		

[a] Since adjusted SS are presented, SS will not total the corrected total of SS.

[b] $p < .10$.

[c] $p < .05$.

Table 3. Mean scores adjusted for pretest

Race	Posttest	Control Group	Experimental Group	$p^a < .10$
Black				
	N	42	13	
	Reading	8.1645	7.7513	
	Arithmetic computation	6.8929	6.6000	
	Arithmetic problem solving	7.5360	7.1374	
Spanish				
	N	7	3	
	Reading	7.0548	6.9055	
	Arithmetic computation	7.0444	6.6631	.09
	Arithmetic problem solving	7.8525	6.5108	
White				
	N	20	5	
	Reading	8.1645	8.281	
	Arithmetic computation	7.1342	7.8231	.05
	Arithmetic problem solving	7.7221	7.5717	

[a]Two-tailed test.

Table 4. Analysis of variance, arithmetic problem solving posttest for Spanish students

Scurce of Variance	DF	SS[a]	MS	F Value
Treatment (Control - Experimental)	1	3.73437	3.73437	3.78[b]
Pretest	1	10.88856	10.88856	11.02[c]
Error	7	6.91238	0.98748	
Corrected total	9			

[a]Since adjusted SS are presented, SS will not total the corrected total for SS.

[b] $p < .10$.

[c] $p < .05$.

Table 5. Analysis of variance, arithmetic computation posttest for white students

Source of Variance	DF	SS[a]	MS	F Value
Treatment (Control - Experimental)	1	1.83385	1.83385	4.30[b]
Pretest	1	32.05073	32.05073	75.19[c]
Error	22	9.37726	0.42623	
Corrected total	24	41.5304		

[a]Since adjusted SS are presented, SS will not total the corrected total for SS.

[b] $p < .05$.

[c] $p < .01$.

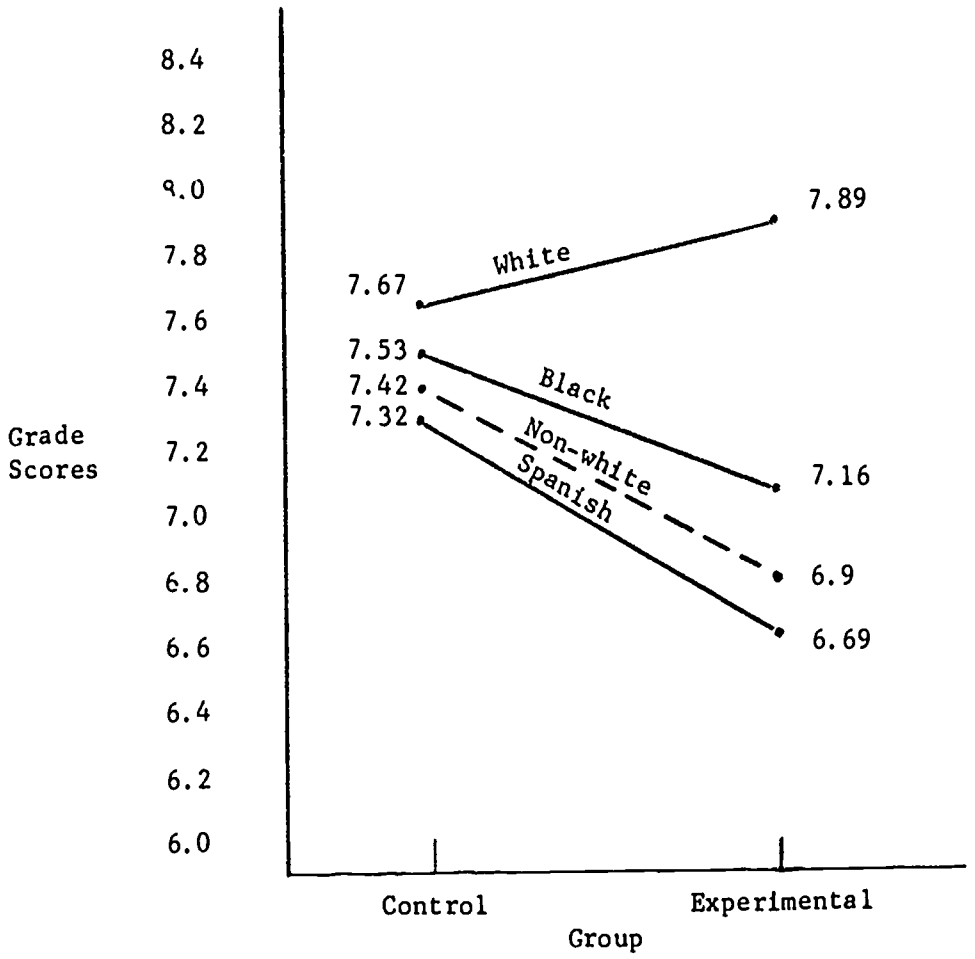

Figure 1. Adjusted means of overall performance based on posttest of pooled dependent measures of performance

Hypothesis V, which stated that altering teacher expectancies would result in higher and more positive overall teacher ratings for the adult students who were the object of the positive expectancy as compared to the remaining students, was not confirmed. There were no significant differences between the two groups.

When the teacher ratings were grouped into three clusters (i.e., arithmetic-reading ability, study habits, and personality attributes) and the data examined by analysis of variance to test for differences between the control and the experimental groups, the results were non-significant for each of the three analyses. Likewise, when post hoc analysis was performed with collapsed conditions, the ratings in each of the three clusters were examined by race: there were no significant differences between teacher ratings of blacks, whites, and Spanish-Americans. It appeared, therefore, that teachers did not rate the experimental subjects significantly higher than the control subjects nor did they rate subjects of one race significantly higher than subjects of another race when conditions were collapsed.

Difference scores for pre- to posttest of the dependent achievement measures (i.e., reading, arithmetic computation, and arithmetic problem solving) were computed for each subject across conditions. Then the mean difference score for each of these measures was computed. Students at or above the mean in a dependent measure were classified as high achievers while students below the mean were classified as low achievers for that particular dependent measure. Thus, all students were classified as either high or low achievers in reading, as high or low achievers in arithmetic computation, and as high or low achievers in arithmetic problem solving. Data were analyzed by analysis of variance.

Post hoc analyses of the teachers' ratings for arithmetic-reading ability, study habits, and for personality attributes were performed for blacks, Spanish-Americans, and whites across conditions according to high versus low achievement.

As shown in Table 6, there were no significant differences in the teachers' ratings in arithmetic-reading ability, study habits, or personality attributes for those black students who were high achievers in

Table 6. Means of teachers' ratings, collapsed over conditions, for black high achievers versus black low achievers

Measure	N	Level of Achievement	Arithmetic-Reading Ability	Study Habits	Personality Attributes
Reading	27	High	4.3111	4.8272	4.8704
	41	Low	4.2537	4.4469	4.7857
Arithmetic computation	26	High	4.4154	4.7137	4.9203
	42	Low	4.1905	4.5262	4.7568
Arithmetic problem solving	34	High	4.4824	4.8922[a]	5.0378
	34	Low	4.0706	4.3036	4.6008

[a] $p < .10$.

reading as contrasted with those black students who were low achievers in reading. Likewise, no significant differences in any of the three clusters were found for black high achievers in arithmetic computation as contrasted with black low achievers in arithmetic computation. Although teachers tended to rate black high achievers in arithmetic problem solving slightly higher than black low achievers ($p < .10$), it appeared that in general teachers did not differentiate in their ratings between black high and black low achievers.

Among the Spanish students (Table 7) there were no significant differences in the teachers' ratings of arithmetic-reading ability, study habits, or personality attributes for Spanish high achievers in reading, arithmetic computation, or arithmetic problem solving as contrasted to low achievers in each of these dependent variables. Again, it appeared that teachers did not differentiate in their ratings between Spanish high and Spanish low achievers.

This pattern was not maintained for white students (Table 8). White high achievers in reading were rated slightly higher ($p < .10$) in arithmetic-reading ability than white low achievers, and significantly higher ($p < .01$) in study habits and personality attributes. White high achievers in arithmetic computation were rated as slightly higher ($p < .10$) in study habits than white low achievers. In arithmetic problem solving, white high achievers were rated as significantly higher ($p < .01$) in arithmetic-reading ability, study habits, and personality attributes.

It would seem that black and Spanish high achievers were not recognized by their teachers as having more ability in arithmetic-reading, as having better study habits, or as being more personable than their racial counterparts; for the most part, they were rated as equal to the underachievers. Yet, white high achievers, for the most part, seemed to be recognized by their teachers as having more ability in arithmetic-reading, as having better study habits, and as being more personable than white low achievers.

Table 7. Means of teachers' ratings, collapsed over conditions, for Spanish high achievers versus Spanish low achievers

Measure	N	Level of Achievement	Arithmetic-Reading Ability	Study Habits	Personality Attributes
Reading	4	High	4.6000	4.7222	5.3036
	8	Low	4.6000	5.3194	5.4554
Arithmetic computation	5	High	4.6000	5.3333	5.4857
	7	Low	4.6000	4.9683	5.3469
Arithmetic problem solving	6	High	4.8667	5.3704	5.7976
	6	Low	4.3333	4.8704	5.0119

Table 8. Means of teachers' ratings, collapsed over conditions, for white high achievers versus white low achievers

Measure	N	Level of Achievement	Arithmetic-Reading Ability	Study Habits	Personality Attributes
Reading	12	High	4.9000[a]	5.1944[b]	5.4226[b]
	15	Low	3.9333	3.778	4.2000
Arithmetic computation	15	High	4.4800	4.8296[a]	5.0714
	12	Low	4.2167	3.8796	4.333
Arithmetic problem solving	14	High	5.0714[b]	5.1190[b]	5.4388[b]
	13	Low	3.6000	3.6410	3.9945

[a] $p < .10$.

[b] $p < .01$.

SUMMARY AND CONCLUSTONS

The major concern of this study was teacher expectancy and its effect upon adult students' intelligence and achievement scores as well as its effect upon the teachers' attitude toward the students. Although the major hypotheses were not supported, there were other implications in the data that were revealing and bear further investigation. It is acknowledged that some of the data were weak; some of the analyses were post hoc and the result of internal analyses. Nevertheless, with these reservations in mind, some distressing trends became apparent. When the data were collapsed over conditions, blacks, Spanish, and whites did not differ significantly in their achievement. This equality in achievement between racial groups should have been consistent in the control and experimental conditions. In the control condition, it was consistent: there were no differences in achievement between the races. However, in the experimental condition in which subjects were to "spurt," there was a trend ($p < .07$) for whites to achieve more than nonwhites.

This inconsistency appeared again in the comparison of achievement between black control and black experimental, Spanish control and Spanish experimental, and white control and white experimental subjects. There were no differences in any of the achievement variables between the black control and the black experimental. Among the Spanish, there was a trend ($p = .09$) for the control Spanish to achieve more in arithmetic problem solving than the experimental Spanish. These findings of no significant differences between the groups did not occur for white subjects. White experimental subjects scored significantly higher ($p = .05$) on the arithmetic computation posttest than white control subjects. This seemed an indication that the self-fulfilling prophecy may have been operating for white subjects and may not have been operating for non-white subjects.

When overall achievement was computed, the trend was even more startling. Nonwhite subjects, who were the object of an induced expectancy, seemed to achieve less than their nonwhite counterparts. Experimental nonwhites appeared to achieve less than control nonwhites. White experimental subjects, on the other hand, seemed to perform equal to, or

slightly better than, their white control counterparts. After computing overall achievement, white experimental subjects seemed to achieve more than nonwhite experimental subjects.

An examination of the teachers' evaluations further confirmed this incongruity. There were no significant differences in the teachers' ratings in arithmetic-reading ability, study habits, or personality attributes for the control and experimental groups. There were no significant differences between the races for the same dependent measures when conditions were collapsed. The teachers rated blacks, Spanish, and whites similarly: there appeared to be an equality in the ratings among the three races.

Yet, a disheartening pattern emerged when the data were analyzed by high-low achievement within race. Teachers did not differentiate between high and low black achievers in reading or between high and low black achievers in arithmetic computation. In arithmetic problem solving, black high achievers tended to be rated somewhat more positively in study habits than black low achievers ($p < .10$). Overall, teachers did not differentiate between black high and black low achievers. Among Spanish subjects, there also were no significant differences between high and low achievers in the dependent measures for any of the rating clusters.

Among the white subjects, however, the results were highly significant in favor of the high achievers. This was most noticeable in the dependent measures of reading and arithmetic problem solving. In reading, white high achievers were rated somewhat more positively ($p < .10$) in arithmetic-reading ability than white low achievers. In study habits and in personality attributes they were rated significantly higher ($p < .01$) than white low achievers.

White high achievers in arithmetic problem solving were rated significantly higher ($p < .01$) than white low achievers in arithmetic-reading ability, in study habits, and in personality attributes. It seemed as if teachers "credited" white students who achieved: they had more personality, they studied better, and they were even more personable. Yet, black and Spanish students who achieved were not "credited": the nonwhite high achievers were not differentiated from the nonwhite low achievers. It seemed as if teachers perceived all nonwhites as more or less alike!

A possible explanation for these trends was that a "self-induced" teacher bias was operating. If so, its effect was stronger than experimenter-induced bias. Injecting a bias, whether it be a "spurting" test result, an I.Q. score, or a favorable opinion, may not be sufficient to overcome prior expectancies. In some cases, it may "boomerang" for those students who were the object of negative "self-induced" teacher bias. It is suggested, with caution, that the trends were indices of prior teacher expectancies, in this case, prior expectancies based upon race. These trends lend support to the findings of Rubovits and Maehr (1973, p.217) who were concerned with measurement of interaction based upon induced teacher expectancy:

> Of special interest, of course, are the comparisons of teacher interaction with black students and white students. In this regard, the present study provides what appears to be a disturbing instance of white racism. Black students were given less attention, ignored more, praised less and criticized more. More startling perhaps are the Race X Label interactions that suggest that it is the gifted black who is given the least attention, is the least praised, and the most criticized, even when comparing him to his nongifted black counterpart.

Rosenthal and Jacobson (1968a, p. 115) noted bias against Mexican children:

> . . . for the intellectual curiosity cluster . . . there were differences in magnitude of expectancy advantage between the Mexican and non-Mexican children. Table 8-10 shows that while there was ample advantage to the non-Mexican children, boys and girls alike, of having been expected to bloom intellectually, there was no such advantage to the Mexican children.

It is suggested that these trends are not solely indices of racism; rather, they may be indices of prior expectancies operating at a greater magnitude than previously anticipated. In the population studied several variables were relatively constant, such as subjects' sex, age, dress, and length of hair. The most prominent distinction was color of skin. Thus, prior expectancies, based upon race, may have played a larger than usual role. In other adult education settings, color of skin may not be as dominant a bias in "self-induced" teacher expectancies. Students'

dress, age, socio-economic level, or occupation may precipitate biases. In any event, "self-induced" teacher expectancies may exist; they may be stronger than any externally induced biases; and they may have a definite effect on the teaching-learning situation.

IMPLICATIONS

This study provided a clue that the current approaches used in adult education workshops for remedial studies teachers may be inadequate in elevating the achievement level of students. Providing teachers with knowledge of the students' high learning ability, high I.Q. scores, or high aptitude scores may be in vain if those students are the recipients of negative prior expectancies. In fact, it even may be detrimental to the students' educational process. Additionally, if the students should achieve, their achievement may go virtually unnoticed by the teacher. These implications lead to the following recommendations for future research.

It is suggested that future research focus on investigation of the self-fulfilling prophecy by assessing teachers' "self-induced" biases. The bases of these expectancies need to be determined. Additionally, the relationship of these bases to the students' actual performance needs to be critically assessed. Research should also focus on an intervention process to cancel the effects, if any, of "self-induced" teacher biases. It is recommended that such research be conducted so that all students may benefit equally from classroom instruction.

LIST OF REFERENCES

Adair, J. G. 1968. Verbal cues in the mediation of experimenter bias. Psychological Reports 22:1045-1053.

Anderson, D. F., and Rosenthal, R. 1968. Some effects of interpersonal expectancy and social interaction on institutionalized retarded children. Proceedings of the 76th Annual Convention of the American Psychological Association 3:605-606. (Summary)

Barber, T. X. 1969. Invalid arguments, postmortem analyses, and the experimenter bias effect. Journal of Consulting and Clinical Psychology 33:11-14.

Barber, T. X., Forgione, A., Chaves, J. F., Calverley, D. S., McPeake, J. D., and Bowen, B. 1969. Five attempts to replicate the experimenter bias effect. Journal of Consulting and Clinical Psychology 33:1-6.

Barber, T. X., and Silver, M. J. 1968a. Fact, fiction, and the experimenter bias effect. Psychological Bulletin 70(6, Pt. 2): 1-29.

Barber, T. X., and Silver, M. J. 1968b. Pitfalls in data analysis and interpretation: A reply to Rosenthal. Psychological Bulletin 70(6, Pt. 2):48-62.

Barber, T. X., and Silver, M. J. 1972. Fact, fiction, and the experimenter bias effect, pp. 342-385. In A. G. Miller (ed.), The Social Psychology of Psychological Research. The Free Press, New York, New York.

Blakey, M. L. 1971. The relationship between teacher prophecy and teacher verbal behavior and their effect upon adult student achievement. Dissertation Abstracts International 31A:4615-4616.

Bloom, R. and Tesser, A. 1971. On reducing experimenter bias: The effects of forewarning. Canadian Journal of Behavioral Science 3:198-208.

Bootzin, R. R. 1969. Induced and stated expectancy in experimenter bias. Proceedings of the 77th Annual Convention of the American Psychological Association 4:365-366. (Summary)

Brophy, J. E., and Good, T. L. 1970. Teachers' communication of differential expectations for children's classroom performance: Some behavioral data. Journal of Educational Psychology 61: 305-374.

Chaikin, A. L., Sigler, E., and Derlega, V. J. 1974. Nonverbal mediators of teacher expectancy effects. Journal of Personality and Social Psychology 30:144-149.

Clairborn, W. L. 1969. Expectancy effects in the classroom: A failure to replicate. Journal of Educational Psychology 60: 377-383.

Conn, L., Edwards, C., Rosenthal, R., and Crowne, D. 1968. Emotion perception and response to teacher expectancy in elementary school children. Psychological Reports 22:27-34.

Deitz, S. M., and Purkey, W. W. 1969. Teacher expectation of performance based on race of student. Psychological Reports 24: 694.

Duncan, S., Rosenberg, M. J., and Finkelstein, J. 1969. Nonverbal communication of experimenter bias. Proceedings of the 77th Annual Convention of the American Psychological Association 4: 369-370. (Summary)

Dusek, J. B., and O'Connell, E. J. 1973 Teacher expectancy effects on the achievement test performance of elementary school children. Journal of Educational Psychology 65:371-377.

Entwisle, D. R., Cornell, E., and Epstein, J. 1972. Effect of a principal's expectations on test performance of elementary-school children. Psychological Reports 31:551-556.

Evans, J. T., and Rosenthal, R. 1969. Interpersonal self-fulfilling prophecies: Further extrapolations from the laboratory to the classroom. Proceedings of the 77th Annual Convention of the American Psychological Association 4:371-372. (Summary)

Fiedler, W. R., Cohen, R. D., and Feeney, S. 1971. An attempt to replicate the teacher expectancy effect. Psychological Reports 29:1223-1228.

Fleming, E. S., and Anttonen, R. G. 1971a. Teacher-expectancy effect examined at different ability levels. The Journal of Special Education 5:127-131.

Fleming, E. S., and Anttonen, R. G. 1971b. Teacher expectancy or my fair lady. American Educational Research Journal 8:241-252.

Friedman, N., Kurland, E., and Rosenthal, R. 1965. Experimenter behavior as an unintended determinant of experimental results. Journal of Projective Techniques and Personality Assessment 29: 479-490.

Cozali, J., and Meyen, E. L. 1970. The influence of the teacher expectancy phenomenon on the academic performances of educable mentally retarded pupils in special classes. The Journal of Special Education 4:417-424.

Greiger, R. M. 1971. Pygmalion revisited: A loud call for caution. Interchange 2:78-91.

Harari, H., and McDavid, J. W. 1973 Name stereotypes and teachers expectations. Journal of Educational Psychology 65:222-225.

Harrington, G. M. 1967. Psychology of the scientist: XXVII. Experimenter bias: Occam's razor versus pascal's wager. Psychological Reports 21:527-528.

Harrington, G. M., and Ingraham, L. H. 1967. Psychology of the scientist: XXV. Experimenter bias and tails of pascal. Psychological Reports 21:513-516.

Hieronymus, A. N. 1972. Adult basic learning examination, pp. 3-7 In O. K. Burros (ed.), The Seventh Mental Measurements Yearbook. The Gryphon Press, Highland Park, New Jersey.

Jacob, T. 1968. The experimenter bias effect: A failure to replicate. Psychonomic Science 13:239-240.

Jensen, A. R. 1969. Review of Pygmalion in the classroom. American Scientist 51:44A-45A.

Jeter, J. T. 1973. Elementary social studies teachers' differential classroom interaction with children as a function of differential expectations of pupil achievement. Dissertation Abstracts International 33A:4680.

Jose, J., and Cody, J. 1971. Teacher-pupil interaction as it relates to attempted changes in teacher expectancy of academic ability and achievement. American Educational Research Journal 8:39-49.

Kennedy, J. J. 1969. Experimenter outcome bias in verbal conditioning: A failure to detect the Rosenthal effect. Psychological Reports 25:495-500.

Keshock, J. D. 1971. An investigation of the effects of the expectancy phenomenon upon the intelligence, achievement and motivation of inner-city elementary school children. Dissertation Abstracts International 32A:243. (Abstract)

Kohl, H. 1968. Great expectations. New York Review of Books 11(4):30-32.

Laszlo, J. P., and Rosenthal, R. 1970. Subject dogmatism, experimenter status, and experimenter expectancy effects. Personality 1:11-23.

Levy, L. H. 1969. Reflections on replications and the experimenter bias effect. Journal of Consulting and Clinical Psychology 33: 15-17.

McFall, R. M., and Schenkein, D. 1970. Experimenter expectancy effects, need for achievement, and field dependence. Journal of Experimental Research in Personality 4:122-128.

McGinley, H., McGinley, P., and Shames, M. 1970. Failure to find experimenter-expectancy effects in I.Q. estimations. Psychological Reports 27:831-834.

Meichenbaum, D. H., Bowers, K. S., and Ross, R. R. 1969. A behavioral analysis of teacher expectancy effect. Journal of Personality and Social Psychology 13:306-316.

Merton, R. K. 1948. The self-fulfilling prophecy. Antioch Review 8:193-210.

Minor, M. W. 1970. Experimenter-expectancy effect as a function of evaluation apprehension. Journal of Personality and Social Psychology 15:326-332.

Mulligan, J. P. 1972. Teacher and student expectations and student achievement in college reading improvement courses. Dissertation Abstracts International 33A:3776. (Abstract)

Myers, J. L. 1972. Fundamentals of Experimental Design. Allyn and Bacon, Boston, Massachusetts.

Rosenthal, R. 1958. Note on the fallible e. Psychological Reports 4:662.

Rosenthal, R. 1966. Experimenter Effects in Behavioral Research. Appleton-Century-Crofts, New York, New York.

Rosenthal, R. 1967. Psychology of the scientist: XXIII. Experimenter expectancy, experimenter experience, and pascal's wager. Psychological Reports 20:619-622.

Rosenthal, R. 1968. Experimenter expectancy and the reassuring nature of the null hypothesis decision procedure. Psychological Bulletin 70:30-47.

Rosenthal, R. 1969a. Interpersonal expectations: Effects of the experimenter's hypothesis, pp. 181-277. In R. Rosenthal and R. L. Rosnow (eds.), Artifact in Behavioral Research. Academic Press, New York, New York.

Rosenthal, R. 1969b. On not so replicated experiments and not so null results. Journal of Consulting and Clinical Psychology 33:7-10.

Rosenthal, R. 1969c. Task variations in studies of experimenter expectancy effects. Perceptual and Motor Skills 29:9-10.

Rosenthal, R. 1972. Pygmalion revisited, revisited: On a loud and careless call for caution. Interchange 3:86-95.

Rosenthal, R. and Fode, K. L. 1963. Psychology of the scientist: V. Three experiments in experimenter bias. Psychological Reports 12:491-511.

Rosenthal, R., and Halas, E. S. 1962. Experimenter effect in the study of invertebrate behavior. Psychological Reports 11:251-256.

Rosenthal, R., and Jacobson, L. 1966. Teachers' expectancies: Determinants of pupils' I.Q. gains. Psychological Reports 19: 115-118.

Rosenthal, R., and Jacobson, L. 1968a. Pygmalion in the Classroom. Holt, Rinehart and Winston, New York, New York.

Rosenthal, R., and Jacobson L. 1968b. Teacher expectations for the disadvantaged. Scientific American 218:19-23.

Rosenthal, R., and Jacobson, L. 1972. Self-fulfilling prophecies in the classroom: Teachers' expectations as unintended determinants of pupils' intellectual competence, pp. 415-437. In A. G. Miller (ed.), The Social Psychology of Psychological Research. Free Press, New York, New York.

Rosenthal, R., Kohn, R., Greenfield, P. M., and Carota, N. 1966. Data desirability, experimenter expectancy, and the results of psychological research. Journal of Personality and Social Psychology 3:20-27.

Rothbart, M., Dalfen, S., and Barrett, R. 1971. Effects of teachers' expectancy on student-teacher interaction. Journal of Educational Psychology 62:49-54.

Rubovits, P. C., and Maehr, M. L. 1971. Pygmalion analyzed: Toward an explanation of the Rosenthal-Jacobson findings. Journal of Personality and Social Psychology 19:197-203.

Rubovits, P. C., and Maehr, M. L. 1973. Pygmalion black and white. Journal of Personality and Social Psychology 25:210-218.

Sattler, J. M., and Winget, B. M. 1970. Intelligence testing procedures as affected by expectancy and I.Q. Journal of Clinical Psychology 26:446-448.

Seaver, W. B. 1973. Effects of naturally induced teacher expectancies. Journal of Personality and Social Psychology 28:333-342.

Snow, R. 1969. Unfinished Pygmalion. Contemporary Psychology 14: 197-199.

Soule, D. 1972. Teacher bias effects with severely retarded children. American Journal of Mental Deficiency 77:208-211.

Thorndike, R. L. 1968. Review of Pygmalion in the classroom. American Educational Research Journal 5:708-711.

Thorndike, R. L. 1969. You have to know how to tell time. American Educational Research Journal 6:692.

Wessler, R. L. 1968. Experimenter expectancy effects in psychomotor performance. Perceptual and Motor Skills 26:911-917.

Wessler, R. L., and Strauss, M. E. 1968. Experimenter expectancy: A failure to replicate. Psychological Reports 22:687-688.

Willis, S. L. 1973. Formation of teachers' expectations of students' academic performance. Dissertation Abstracts International 33a: 4960. (Abstract)

Zegers, R. A. 1968. Expectancy and the effects of confirmation and disconfirmation. Journal of Personality and Social Psychology 9:67-71.

Zoble, E. J., and Seeman, W. 1970. Can experimenter bias influence certain affective responses? Proceedings of the 78th Annual Convention of American Psychological Association 5:421-422. (Summary)

A P P E N D I C E S

Appendix A

Explanation of Research Project

Explanation of Research Project to Assistant Director

The following research proposes to investigate the effect of expectancies of the A.B.E. teacher upon the achievement and intelligence level of the A.B.E. student. Nationally and state-wide, Adult Basic Education programs have not been as successful as perhaps they could be. Drop-out rates are relatively high and the level of achievement is sometimes low. This research proposes that perhaps it is something that the teacher--rather than the student--is doing or not doing in the classroom that accounts for these facts.

Research in the area of expectancies primarily has involved children. The most well-known study in this area is by Rosenthal and Jacobson in which an expectancy was created for the teacher. Teachers were informed on the basis of a fictional test that some children in their classrooms were "academic spurters" (i.e., students whose academic performance would improve dramatically). In reality, these children were randomly selected. At the end of the school year when the children were retested, those students who previously were identified as "academic spurters" gained significantly in I.Q. score as compared to the "non-spurters." The fact that this gain was highly significant was attributed to the fact that teachers expected these students to perform well. Their expectation created some type of interaction with the "academic spurters" which encouraged learning. Minimal research has been done in this area with adults, especially with adult basic education students.

The researcher will administer to students in newly formed Adult Basic Education classes an achievement test (Adult Basic Learning Examination) and a non-verbal intelligence test (Standard Progressive Matrices). These two tests are combined for test administration and titled with the fictitious name The Princeton Test of Educational Thematic Perception for Adult Basic Education Students. The test will be described to the teacher as a national test in which those adult students who will profit most from class instruction will be identified. It will be stressed to the teacher that the results of the test are highly reliable in identifying successful students. After the test has been administered, the teacher will be sent a list of students from her classroom that the test has identified as "potentially successful students." In reality, students will be randomly selected to be "potentially successful students." After 40 hours of class instruction, the students will be retested with the intelligence test and an alternate form of the achievement test. In addition, teachers will complete a rating sheet on each student. Total classroom time for this research will be two class sessions: one class session at the start of the course, and one session at the end of the course.

If there is a statistically significant difference between the "successful students" and the control group, there will be some very meaningful implications for adult basic education:

1. The self-fulfilling expectations of the teacher may be one of the causes of failure and drop-outs. These expectations may be one factor in the successful or unsuccessful performance of A.B.E. students.

2. If teachers are aware that a self-fulfilling prophecy does indeed exist, and that by negative expectations they may be causing negative results, they may be more open to change.
3. If the self-fulfilling prophecy does exist between teachers and A.B.E. students, then teacher training and workshops will take on new meaning and new structure: teachers will become aware that it is their expectations, and their interactions with A.B.E. students, that make the difference in the achievement of the students.
4. This type of research will be one step in understanding what will increase the chances of adult students staying in A.B.E. programs and gaining greater levels of achievement in such programs.

Appendix B

Dependent Measures

TEACHER RATING SHEET FOR INDIVIDUAL STUDENTS

Student's Name _____

INSTRUCTIONS: Rate the student on each of the following items by circling the appropriate number.

Item	Strongly Disagree			Neutral			Strongly Agree
1. The student will succeed in the future.	1	2	3	4	5	6	7
2. The student is well-adjusted.	1	2	3	4	5	6	7
3. The student shows pride in his work.	1	2	3	4	5	6	7
4. The student demonstrates good health habits.	1	2	3	4	5	6	7
5. The student works well independently.	1	2	3	4	5	6	7
6. The student accepts responsibility for his learning.	1	2	3	4	5	6	7
7. The student is self-disciplined.	1	2	3	4	5	6	7
8. The student is able to follow directions.	1	2	3	4	5	6	7
9. The student is hostile.	1	2	3	4	5	6	7
10. The student shows improvement in fundamental mathematical operations.	1	2	3	4	5	6	7
11. The student is courteous and considerate of others.	1	2	3	4	5	6	7
12. The student is generally happy.	1	2	3	4	5	6	7
13. The student uses time and materials wisely.	1	2	3	4	5	6	7
14. The student shows interest in class work.	1	2	3	4	5	6	7

TEACHER RATING SHEET FOR INDIVIDUAL STUDENTS (continued)

INSTRUCTIONS: Rate the student on each of the following items by circling the appropriate number.

Item	Strongly Disagree			Neutral			Strongly Agree
15. The student accepts suggestions.	1	2	3	4	5	6	7
16. The student understands new mathematical concepts.	1	2	3	4	5	6	7
17. The student participates in discussions.	1	2	3	4	5	6	7
18. The student has a good sense of humor.	1	2	3	4	5	6	7
19. The student shows improvement in mathematical problem solving.	1	2	3	4	5	6	7
20. The student is motivated to succeed.	1	2	3	4	5	6	7
21. The student is able to express himself fluently.	1	2	3	4	5	6	7
22. The student works well with others.	1	2	3	4	5	6	7
23. The student makes unnecessary demands on the teacher's time.	1	2	3	4	5	6	7
24. The student needs continuous approval for his work.	1	2	3	4	5	6	7
25. The student shows improvement in vocabulary.	1	2	3	4	5	6	7
26. The student tries his best.	1	2	3	4	5	6	7
27. The student accepts constructive critical evaluations.	1	2	3	4	5	6	7
28. The student is defensive.	1	2	3	4	5	6	7

Appendix C

Manipulation Check

MANIPULATION CHECK

Please briefly state the purpose, as you see it, of the testing sessions with the measurement specialists from North Carolina State University.

Please feel free to write any additional comments you may have regarding this testing.

Can you name the students who the test identified as those who would profit most from classroom instruction? If so, please write their names.