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ABSTRACT

The purposes of this study were to determine whether fourth grade social studies teachers verbally interacted differently with pupils as a function of differential expectations of pupil achievement and to determine whether fourth grade social studies teachers verbally interacted differently with boys and girls. Data were collected using the Brophy-Good dyadic observation system. Results revealed that teachers differ significantly in their teaching behavior with respect to high- and low-expectation pupils. However, teachers did not discriminate differentially between boys and girls. The findings of the study suggest that teachers probably do communicate differential performance expectations to different pupils through their classroom behavior, and the nature of this differential treatment is such as to encourage the pupils to respond in ways which would confirm teacher expectancies. (A 20-item bibliography is included.) (Author)

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ELEMENTARY SCHOOL TEACHERS' DIFFERENTIAL CLASSROOM INTERACTION
WITH CHILDREN AS A FUNCTION OF DIFFERENTIAL
EXPECTATIONS OF PUPIL ACHIEVEMENTS

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The function of teachers' expectations of pupil achievement as self-fulfilling prophecies has been an engaging research problem during the past several years. Rosenthal and Jacobson (1968) gained considerable attention with their attempt to test the self-fulfilling prophecy hypothesis in the classroom. These investigators reported that pupil achievement data obtained at the end of the school year were significantly affected by performance expectations induced in teachers at the beginning of the year, and that the nature of the effects observed was consistent with the idea that teachers' expectations functioned as self-fulfilling prophecies. The methodology employed in this study has been criticized severely (e.g., Thorndike, 1968; Snow, 1969; Elashoff and Snow, 1971). Consequently, the support provided for the self-fulfilling prophecy hypothesis remains tenuous even though the idea persists as very attractive.

Several studies (Conn and others, 1968; Claiborn, 1969; Evans and Rosenthal, 1969; Beez, 1970; Fleming and Anttonen, 1971; and Jose, 1971) have used the experimental method introduced by Rosenthal and Jacobson in which teachers expectations are manipulated through some kind of treatment. The researchers have tested the effects of the treatment on either the teaching behavior of the teachers or the achievement of the pupils. Results from experimental studies involving manipulation of teacher expectations are mixed. Several support the differential expectation (self-fulfilling) hypothesis of teacher expectations (e.g., Beez, 1968; Meichenbaum and others, 1969), whereas others do not (e.g.,

1. Appreciation for his assistance in this study is accorded Dr. Jere Brophy, The University of Texas at Austin.

Conn and others, 1968; Claiborn, 1960; Jose, 1971).

Another line of inquiry has used teachers' naturalistically formed expectations (e.g., Brophy and Good, 1970; Mendoza and others, 1971; and Cornbleth and others, 1972). In these studies, teachers' expectations for their pupils have been determined and then their interactions with pupils have been observed. Research to date has revealed significant differences in teachers' treatment of (interactions with) high- and low-expectation pupils both at early primary and at secondary levels (Brophy and Good, 1970; Mendoza and others, 1971; and Cornbleth and others, 1972). However, no examination of differential teacher behavior related to teachers' expectations of pupils' academic achievement has occurred at the intermediate grade level. Too, no research of this type has been conducted in the teaching of elementary school social studies. Consequently, this study was designed as an investigation into a relatively unexplored area.

Procedures

Subjects

A total of ten female fourth grade teachers and 120 pupils attending three public elementary schools in a suburban district contiguous

to a large central Texas city provided data for this study. Participating teachers were told that the focus of the study was the behavior of pupils at different achievement levels in the day-to-day activities. This explanation was intended to free the teacher of any responsibility to prepare specially for the days of observation.

Ranking Procedure

Teachers were asked to rank the pupils in their class in order of expected achievement in social studies. Rankings obtained from the teachers were used to categorize pupils into high- and low-expectancy groups. For each class, the three highest ranking boys and the three highest ranking girls were classified as high-expectation pupils; the three lowest ranking boys and the three lowest ranking girls were classified as low-expectation pupils. Substitutes for the target pupils were also identified and observed when the originally designated pupils were absent. Only twelve substitutes were thus employed during the course of the study; observation of these twelve pupils represented 1/60 of the possible opportunities to observe all pupils. Consequently, employment of these data seem not to distort the results.

Instrument and Data Collection

Classrooms were observed by the principal investigator and 12

trained observers using the Brophy-Good dyadic observation system (1969b). Most systems for observing teacher-pupil interaction code all teacher contacts with pupils and pupil initiations and responses without differentiating between individual pupils. The Brophy-Good system, on the other hand, enables an observer to record and preserve interaction between the teacher and individual pupils. Quality of contact (what the teacher does when engaged in certain kinds of interactions with the pupil) and quantity of contact (the sheer frequency of the different kinds of interactions) may be studied separately and assessed.

Fourteen scale scores were obtained and used in this study. They were:

- 1 = number public response opportunities
- 2 = teacher-initiated work interactions
- 3 = pupil-initiated work interactions
- 4 = total number private teacher-student interactions
- 5 = total teacher-pupil contacts
- 6 = process questions
- 7 = product questions
- 8 = choice questions
- 9 = self-reference questions
- 10 = number times pupil received praise after right answer
- 11 = number times pupil received new questions after giving right answer
- 12 = pupil answers not followed by any feedback
- 13 = number times teaching responded with sustain feedback after pupil failure
- 14 = criticisms following wrong answers

Observers engaged in a three-week training period; four sessions totaling ten hours of training were conducted. During the first two weeks of coding, pairs of observers worked in each classroom to estab-

lish reliability. After reliability was established (interobserver agreement of .80), the observers began to work individually.

Six forty-five minute observations were made in each classroom. The forty-five minute periods were the periods in which pupils were engaged in regular social studies lessons.

Data Analysis

Obtained data were subjected to analysis of variance procedures employing a 10 (teachers) x 2 (pupil sex) x 2 (teacher expectancy) design using the computer program ANOVAR on the CDC 6600 computer at The University of Texas at Austin.

Results

Table 1 displays the means of observation scale scores and ratios according to pupil sex and expectation. The 10 x 2 x 2 analyses of variance for each scale and ratio are reported in Table 2.

Statistically significant differences between teachers were revealed on thirteen of the fourteen scales. Nine of these differences exceeded $p < .01$. Those nine scales were: number of public response opportunities, teacher-initiated work interactions, pupil-initiated work interactions, total number of private pupil-teacher interactions, number of process questions, number of product questions, number of choice questions, number of times pupil received praise after right answers, number of times pupil received new questions after right answers,

and number of pupil answers not followed by any feedback. At the $p < .05$ level, differences were found for two scales: number of self-reference questions and number of times pupils received praise after right answers. At the $p < .20$ level, differences were observed for two scales--total teacher-pupil contact and number of times teacher responded with sustaining feedback after pupil failure. This number of significant differences (11 of 14 at $p < .05$) is itself significant (Sakoda, Cohen & Beall, 1954).

According to sex of pupil, only one possibly significant difference ($p < .10$ level) was noted: number of teacher-initiated work interactions. Teachers initiated more work interactions with males than with females. Since only one of 14 significant differences is not itself significant ($p < .05$), the conclusion is obvious that these teachers did not differentially interact with pupils as a function of pupil sex.

With respect to teacher expectation of pupil achievement, the central concern of this study, significant differences were found for nine of the fourteen scales and possibly significant and reportable differences on three additional scales. This number (9 of 14) is itself significant at $p < .05$ (Sakoda, Cohen and Beall, 1954). Obtained significant differences at the $p < .01$ level revealed: high-expectation pupils received more public response opportunities than did low-expectation pupils; highs had more total teacher-pupil contact than did lows; highs received both more process and product questions than did lows; and low-expectation pupils had more answers not followed by any feedback than did highs. At the $p < .05$ level, differences were

obtained on four scales: high-expectation pupils initiated more work interactions with teachers than did low-expectation pupils; highs received more choice questions than did lows; highs received more sustaining feedback after wrong answers than did lows; and low-expectation pupils received more criticisms following wrong answers than did highs. One possibly significant difference ($p < .10$ level) was revealed on one scale: teachers initiated more work interactions with lows than with highs. At the $p < .20$ level, differences were noted on two scales: teachers asked highs more questions following their right answers than were asked of lows, and teachers praised lows following right answers more frequently than they did for highs.

Of 56 possible two- and three-way interactions, only five were significant at $p < .05$. This number is itself not significant. Consequently, these interactions are most useful in understanding the main effects of interest. The interactions indicate that teachers in the study differentially communicated with high- and low expectation pupils with respect to pupil-initiated work interactions, choice questions, number of times pupil received new questions after giving right answers, and pupil answers not followed by any feedback. Teachers in the study population did interact differentially with boys and girls on only one scale, teacher choice questions.

Discussion

Findings of this study generally are consistent with other research conducted in junior high school mathematics, reading, and social

studies classes (Mendoza, and others, 1971), in secondary school social studies classes (Cornblath and others, 1972), and in self-contained primary classrooms (Good, 1970; Brophy and Good, 1970). Obtained significant differences favored high expectation pupils and occurred both in the quantity of teacher-pupil contact and in the quality of teacher-interaction, i.e., highs were asked both more product and process questions, highs received more extended teacher feedback, and highs received proportionally more praise and less criticism.

The inequality of contact for lows provides additional support for the differential expectation hypothesis. The observed differences in teacher behavior seem clear evidence of discrimination against pupils for whom teachers had low expectations of academic performance. This phenomenon also appears to be apparent with teachers, albeit not all teachers, at several levels of schooling and in several curricular areas.

In this study, teachers did not interact differentially with boys and girls. This finding is consistent with other classroom observational research studies. The present findings, while adding to the destruction of the general belief that female teachers discriminate against boys in their interactions, add another dimension. They indicate that teachers probably do not interact differentially with boys and girls who are expected to be high and low achievers in social studies. That is, teachers in this study appeared to be influenced in their interactions by the level of academic expectation rather than the sex of the pupil.

Social studies classes in this study were conducted as entire class groups mainly, probably more like junior high school and senior high school classes than primary classes, certainly first-grade reading instruction. There were no small groups (3-8 pupils), little, if any, individual project activities, and little use of varied instructional media. Consequently, one might ask, do teachers' expectations relate as powerfully to their differential behavior in teaching situations other than with class size groups and engaged in varied instructional tasks? Such a question critically important as classroom instruction becomes more individualized, must remain unanswered until more appropriate research evidence is available.

While this study investigated differential teacher verbal behavior, it did not address directly the issue of the relationship of teacher verbal behavior to pupil performance (achievement). Relationships of interactions to pupil learning, if they do exist, must be the subject of subsequent research. Nevertheless, the present results add weight to the conviction that teacher expectations are translated into specific teaching behaviors. That these behaviors communicate, and powerfully, to pupils must be a prominent speculation. Serious attention should be directed to investigations which will shed additional light on this critical area.

Important also will be inquiry into why some teachers interact more, both quantitatively and qualitatively, with their low-expectation pupils than with their highs. These teachers may be those judged

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superior or "master" teachers at some educational levels, those whose level of concerns is mature (Fuller, 1969), or those whose pupils actually achieve higher than predicted.

TABLE 1

Summary of Means on Each Observation Scale for Each Teacher in the Study by Pupil Sex and Teacher Expectation of Social Studies Achievement

Teacher	Scale 1				Scale 2				Scale 3			
	Pupil Sex		Expectation		Pupil Sex		Expectation		Pupil Sex		Expectation	
	M	F	Lo	Hi	M	F	Lo	Hi	M	F	Lo	Hi
1	13.83	15.50	15.67	13.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	14.67	13.17	12.83	15.00	.17	.17	.17	.17	.17	.17	0.00	.33
3	8.17	9.67	5.00	12.83	3.33	1.83	3.50	1.67	1.50	2.50	.83	3.17
4	6.50	7.00	4.50	9.00	1.17	.67	1.33	.50	.83	.83	.50	1.17
5	12.33	13.17	7.50	18.00	.67	1.17	1.00	.83	1.17	2.33	.67	2.83
6	10.67	6.50	6.00	11.17	2.67	1.83	2.50	2.00	4.67	2.33	4.50	2.50
7	7.33	7.50	5.17	9.67	1.67	.83	1.83	.67	2.00	1.83	.50	3.33
8	12.00	14.00	5.83	20.17	.33	0.00	.17	.17	1.17	.83	.50	1.50
9	8.67	13.50	7.00	15.17	2.50	2.50	2.17	2.83	1.67	3.50	2.67	2.50
10	13.17	8.83	7.83	14.17	.33	.17	0.00	.50	.17	.17	.17	.17

TABLE 1 (continued)

Teacher	Scale 4				Scale 5				Scale 6			
	Pupil Sex		Expectation		Pupil Sex		Expectation		Pupil Sex		Expectation	
	M	F	Lo	Hi	M	F	Lo	Hi	M	F	Lo	Hi
1	0.00	0.00	0.00	0.00	13.83	15.50	15.67	13.67	.83	1.00	.50	1.33
2	.33	.33	.17	.50	15.00	13.50	13.00	15.00	.33	.17	0.00	.50
3	4.83	4.33	4.33	4.83	13.00	14.00	9.33	17.67	.67	.83	0.00	1.50
4	2.00	1.50	1.83	1.67	8.50	8.50	6.33	10.67	1.17	1.00	0.00	2.17
5	1.83	3.50	1.67	3.67	14.17	16.67	9.17	21.67	1.00	.83	.67	1.17
6	7.33	4.17	7.00	4.50	18.00	10.67	13.00	15.67	2.17	.67	1.17	1.17
7	3.67	2.67	2.33	4.00	11.00	10.17	7.50	13.67	0.00	.17	0.00	.17
8	2.33	.83	1.50	1.67	13.50	14.83	6.50	21.83	1.00	1.83	.17	2.67
9	4.17	6.00	4.83	5.33	12.83	19.50	11.83	20.50	3.67	5.50	2.67	6.50
10	.50	.33	.17	.67	13.67	9.17	8.00	14.83	3.00	2.50	2.50	3.00

TABLE 1 (continued)

Teacher	Scale 7				Scale 8				Scale 9			
	Pupil Sex		Expectation		Pupil Sex		Expectation		Pupil Sex		Expectation	
	M	F	Lo	Hi	M	F	Lo	Hi	M	F	Lo	Hi
1	12.83	12.50	13.50	11.83	.17	1.67	1.33	.50	0.00	.33	.33	0.00
2	13.17	12.33	11.83	13.67	1.17	.83	1.17	.83	0.00	0.00	0.00	0.00
3	6.00	6.83	3.83	9.00	1.33	1.17	.83	1.67	.33	.83	.33	.83
4	4.83	5.67	4.33	6.17	.17	0.00	0.00	.17	0.00	0.00	0.00	0.00
5	10.83	12.00	6.33	16.50	.33	.33	.33	.33	.17	0.00	.17	0.00
6	8.00	5.50	4.17	0.33	0.00	.33	.17	.17	.50	0.00	.50	0.00
7	7.00	7.17	5.00	9.17	.33	.17	.17	.33	0.00	0.00	0.00	0.00
8	7.83	9.83	4.83	12.83	3.00	2.00	.83	4.17	.17	.33	0.00	.50
9	4.17	7.33	3.67	7.83	.67	.67	.50	.83	.17	0.00	.17	0.00
10	9.33	6.17	5.17	10.33	.67	.17	0.00	.83	.17	0.00	.17	0.00

TABLE 1 (continued)

Teacher	Scale 10				Scale 11				Scale 12			
	Pupil Sex		Expectation		Pupil Sex		Expectation		Pupil Sex		Expectation	
	M	F	Lo	Hi	M	F	Lo	Hi	M	F	Lo	Hi
1	.06	0.00	.06	0.00	.23	.24	.34	.14	.67	.67	1.00	.33
2	.06	.11	.16	.01	.07	.14	.10	.11	2.17	2.33	3.67	.83
3	.02	0.00	0.00	.02	.01	.07	0.00	.08	.83	.33	1.00	.17
4	0.00	0.00	0.00	0.00	.09	.08	0.00	.17	.33	.50	.83	0.00
5	.03	.01	.02	.01	.07	.09	.02	.14	1.50	.67	1.33	.83
6	0.00	0.00	0.00	0.00	.06	.07	.03	.10	.50	.50	.83	.17
7	0.00	0.00	0.00	0.00	.08	.10	0.00	.18	.67	.50	1.17	0.00
8	.01	0.00	0.00	.01	.05	.06	0.00	.11	1.33	2.17	2.50	1.00
9	0.00	.03	.01	.02	.24	.16	.29	.11	1.33	1.67	.67	2.33
10	.05	.05	.04	.06	.02	0.00	.02	0.00	1.83	.67	1.33	1.17

TABLE 1 (continued)

Teacher	Scale 13				Scale 14			
	Pupil Sex		Expectation		Pupil Sex		Expectation	
	M	F	Lo	Hi	M	F	Lo	Hi
1	4.00	4.12	6.17	1.95	0.00	0.00	0.00	0.00
2	2.53	2.87	2.27	3.13	.23	0.00	.23	0.00
3	1.67	1.67	0.00	3.33	0.00	.83	.83	0.00
4	3.33	2.00	.33	5.00	.83	0.00	.83	0.00
5	0.00	1.67	0.00	1.67	.23	1.67	1.90	0.00
6	0.00	.83	0.00	.83	1.47	0.00	1.47	0.00
7	2.22	2.77	1.67	3.33	0.00	0.00	0.00	0.00
8	2.50	.83	0.00	3.33	.67	.28	.95	0.00
9	1.10	.83	.83	1.10	0.00	0.00	0.00	0.00
10	1.67	0.00	0.00	1.67	.55	.83	1.38	0.00

TABLE 2

Summary of Analyses of Variance of Observation Scale Scores

Variable	Between Teachers		Between Pupil Sex		Teachers X Pupil Sex		Teachers X Teachers Expectations		Pupil Sex X Pupil Sex Expectations		Teachers X Teachers Expectations Within	
	(df=9)	(df=1)	(df=9)	(df=1)	(df=9)	(df=1)	(df=9)	(df=1)	(df=9)	(df=1)	(df=9)	(df=80)
1	92.98 F=3.03****	.68	1134.68 F=36.94****	23.84	60.51 F=1.97**	66.01 F=2.15*	37.99	30.72	51.87 F=1.73**	53.33 F=2.58*	33.52 F=1.62*	20.63
2	12.33 F=11.21****	4.03 F=3.67**	3.33 F=3.03**	.978	1.76 F=1.60*	4.03 F=3.67**	1.98 F=1.80**	1.10	17.63 F=3.40**	140.83 F=3.17**	51.87	44.38
3	16.06 F=6.32****	.41	15.41 F=6.06***	3.72 F=1.46*	6.21 F=2.44***	3.01	2.73	2.54	4.35	76.64 F=1.73**	2.48	2.57
4	51.63 F=9.96****	3.33	2.70	6.28	4.35	17.63 F=3.40**	5.69	5.18	4.35	76.64 F=1.73**	5.69	5.18
5	68.39 F=1.54*	.30	1280.53 F=28.86****	44.37	76.64 F=1.73**	140.83 F=3.17**	51.87	44.38	140.83 F=3.17**	51.87	51.87	44.38
6	21.33 F=8.31****	.13	50.70 F=19.75****	2.22	4.24 F=1.67*	.53	2.48	2.57	.53	2.48	2.48	2.57
7	96.17 F=4.66****	.53	580.80 F=28.15****	11.24	32.69 F=1.58*	53.33 F=2.58*	33.52 F=1.62*	20.63	53.33 F=2.58*	33.52 F=1.62*	33.52 F=1.62*	20.63

Variable	Between Teachers		Between Pupil Sex		Teachers X Pupil Sex		Teachers X Pupil Sex		Teachers X Pupil Sex	
	(df=9)	(df=1)	Expectations (df=1)	Pupil Sex (df=9)	Expectations (df=9)	Pupil Sex (df=1)	Expectations (df=9)	Pupil Sex (df=1)	Expectations (df=9)	Within (df=80)
3	6.31 F=6.52***	.08	6.08 F=6.28***	1.26	3.82 F=3.95***	.41	3.08 F=3.18***	.97		
9	.39 F=2.10***	.00	.03	.24	.31 F=1.70*	.53 F=2.91**	.18	.18		
10	.01 F=2.29***	.00	.01 F=1.80*	.00	.01 F=1.95**	.00	.01	.00		
11	.06 F=4.43***	.00	.03 F=2.43*	.01	.05 F=4.00***	.00	.01	.01		
12	4.61 F=4.99***	.41	15.88 F=18.24***	1.02 F=4.09***	3.78	.21	.26	.93		
13	15.52 F=1.46*	.62	59.64 F=5.60***	3.70 F=1.62*	17.27 F=1.86*	19.85	7.11	10.65		
14	1.42	.04	17.33 F=7.27***	1.95	1.42	.04	1.95	2.38		

* p .20 Key: variables

- ** p .10 1=number public response opportunities
- *** p .05 2=teacher-initiated work interactions
- **** p .01 3=pupil-initiated work interactions
- 4=total number private teacher-student interactions
- 5=total teacher-pupil contact
- 6=process questions
- 7=product questions
- 8=choice questions
- 9=self-reference questions
- 10=number times pupil received praise after right answer
- 11=number times pupil received new questions after giving right answer
- 12=pupil answers not followed by any feedback
- 13=number times teacher responded with sustain feedback after pupil failure
- 14=criticisms following wrong answers

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ABSTRACT

The purposes of the study were: to determine whether fourth-grade social studies teachers verbally interacted differently with pupils as a function of differential expectations of pupil achievement and to determine whether fourth-grade social studies teachers verbally interacted differently with boys and girls.

Data were collected using the Brophy-Good, dyadic observation system. Results revealed teachers to differ significantly in their teaching behavior with respect to high- and low-expectation pupils. However, teachers did not discriminate differentially between boys and girls.

The findings of the study suggest that teachers probably do communicate differential performance expectations to different pupils through their classroom behavior, and the nature of this differential treatment is such as to encourage the pupils to respond in ways which would confirm teacher expectancies.