DOCUMENT RESUME

ED 199 297 TM 810 318

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TITLE Using Student Perceptions of Teacher Behavior to Predict Student Outcomes.
SPONS AGENCY National Inst. of Education (ED), Washington, D.C.: National Inst. of Mental Health (DHEW), Rockville, Md.
PUB DATE Apr 81
GRANT NIE-G-79-0078: NIE-G-80-0071: NIMH-1-RO1-MH34379-01
NOTE 23p.: Paper presented at the Annual Meeting of the American Educational Research Association (65th, Los Angeles, CA, April 13-17, 1981).

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Correlation: Elementary Education: Elementary School Mathematics: *High Achievement: *Low Achievement: *Predictive Validity: Reading Achievement: Self Concept: Self Concept Measures: *Student Teacher Relationship: Teacher Behavior
IDENTIFIERS *Teacher Expectations: *Teacher Treatment Inventory (Weinstein et al)

ABSTRACT

The ways in which students' perceptions of teacher behavior in the elementary school classroom clarifies the relationships among teacher expectations, student expectations, and student achievement are examined. Subjects in two data sets consisted of 234 grade 4-6 students from 16 classrooms in an urban, ethnically mixed school district, and 101 grade 3-5 students in seven additional classrooms from the same school district. All students completed the Teacher Treatment Inventory (TTI), consisting of 44 items describing ways in which teachers work with students. Additional data collected from all students included year end achievement scores and a self-concept of attainment measure. Teachers provided rankings of expected achievement in reading, mathematics, and schoolwork for each of their students. According to students, low achievers get more negative feedback and teacher direction, and more work and rule oriented teacher behaviors: high achievers get higher expectations, more opportunities to participate, and more choice of tasks. Hierarchical regressions analyses showed that year end achievement was less effectively predicted by prior achievement, but more effectively predicted by teacher expectations in high than in low perceived differentiating classrooms. (Author/RL)

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A paper presented at the annual meeting of the American Educational Research Association, Los Angeles, April 1981.

This research was supported in part by the National Institute of Education Grants G-79-0078 and G-80-0071, and by the National Institute of Mental Health Grant 1-R01-MH34379-01 to Rhona S. Weinstein, principal investigator. The opinions expressed herein do not necessarily reflect the position or the policy of the National Institute of Education or the National Institute of Mental Health, and no official endorsement should be inferred. Acknowledgements and thanks are due to William A. Meredith for data analysis consultation, and to Lee Sharp and Greg Greenberg for their assistance in data analysis.

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Researchers concerned with teacher expectation effects have turned to students themselves to learn about the ways in which teachers might influence students' expectations for academic success and student achievement. Student cognitive processing of classroom events has become an important focus of research, and has been recognized as an important link between teacher expectations and student achievement outcomes. Recently, researchers have proposed that students acquire information from their teachers about their abilities, internalize as their own the expectations communicated to them, and perform according to their role as a high or a low achiever (Braun, 1976; Weinstein & Middlestadt, Note 1).

Our research has shown that students do perceive differences in the ways teachers work with high and low achievers (Weinstein & Middlestadt, 1979; Brattesani & Weinstein, Note 2; Weinstein, Middlestadt, Brattesani, & Marshall, Note 3), thus confirming that students have access to information about the relationships between teacher treatment and student ability. The same pattern of differences in perceived teacher treatment occurred in all classrooms, but more extreme differences were perceived in some classrooms than in others (Marshall, Weinstein,

Middlestadt, & Brattesani, Note 4). We are now exploring the ways in which student perceptions of differential teacher behavior toward high and low achievers, as well as student perceptions of their own teacher treatment, influence student outcomes, such as students' own academic expectations and student achievement.

Hypotheses

The hypotheses addressed in this paper concern the different patterns of relationships among teacher expectations, student perceptions, and student achievement outcome variables that occur in classrooms with high perceived differentiation compared to classrooms with low perceived differentiation. That is, in classrooms in which students perceived large differences in the ways teachers worked with high and low achievers, students should be more likely to get information about their abilities from their teachers' cues. Thus, stronger relationships among student expectations, teacher expectations, student perceptions of teacher behavior toward them, and student achievement were expected in high than in low differentiating classrooms. In our analyses, then, student perceptions of differential teacher behavior were used to distinguish two types of classrooms, and were hypothesized to moderate the prediction of outcomes at the individual level.

Hypothesis 1. Student expectations are more congruent with teacher expectations in classrooms with high perceived differentiation in teacher treatment than in classrooms with low perceived differentiation in teacher treatment.

Hypothesis 2. Teacher expectations predict year end achievement and student expectation scores beyond what is predicted by prior achievement scores alone, and teacher expectations are better predictors of outcomes in high than in low differentiating classrooms.

The first and larger of two compatible data sets was used to test these hypotheses. The second data set was used to corroborate these findings and to test the relationships among expectations, achievement, and student perceptions of teacher treatment toward themselves.

Individual students' perceptions of the ways in which their teachers work with them in the classroom can be used to confirm students' reports of teacher behavior toward high and low achieving students in general. In addition, the amount of differential treatment perceived toward others can be used as a moderator of relationships between achievement measures and perceived teacher treatment toward self.

> Hypothesis 3. The relationships between students' perceptions of teacher treatment toward themselves and their own achievement levels parallels students' perceptions of teacher treatment toward high and low achieving targets. In other words, high achievers should perceive self treatment that is similar to perceptions of teacher treatment toward other high achievers; low achievers should perceive self treatment that is similar to perceptions of teacher treatment toward other low achievers.
>
> Hypothesis 4. The congruence between perceptions of teacher behavior toward self and toward others is greater in high than in low differentiating classrooms.

Method

Subjects. The subjects in the first of two data sets consisted of 234 fourth, fifth, and sixth graders from 16 classrooms in an urban, ethnically mixed school district. Subjects in the second data set were 101 third, fourth and fifth graders in seven additional classrooms from the same school district. The classrooms represented a broad spectrum of educational philosophy, including both open and more traditional classroom structures.

Measures and Procedures. All students completed the Teacher Treatment Inventory (TTI), consisting of 44 items describing ways in which teachers work with students (Weinstein & Middlestadt, 1979). Students indicated on a four-point scale how often their own teacher worked in these ways with one of four hypothetical target students described on the questionnaire -- a male high achiever, a male low achiever, a female high achiever, or a female low achiever. In the first sample, to maximize the number of subjects available for within-classroom comparisons, only two of the four forms were assigned in each classroom, the high and low achiever forms for the male target or the female target. The second sample of students completed either a high or low achiever form without reference to sex of the target student. High and low achiever forms were randomly assigned to students within each classroom. The second sample of students also completed the Teacher Treatment Inventory: Self-rating, in which each item paralleled the original TTI but was phrased in the first person. On the TTI: Self-rating, then, students indicated how often their teacher worked with them in the ways described.

Four scales were constructed on the basis of a factor analysis of the Teacher Treatment Inventory (Weinstein, Middlestadt, Brattesani, & Marshall, Note 3). Scale 1 describes ways in which the teacher helps the student and provides support; Scale 2, Negative Feedback and Teacher Direction, reflects negative feedback about schoolwork and effort, and a high degree of control over the student's activities; Scale 3, Work and Rule Orientation, reflects teacher emphasis on learning, getting work done, and following rules; Scale 4, High Expectations, Opportunity and Choice, reflects trust by the teacher, positive feelings, and provision

of opportunities to participate and to work in autonomous ways. Because scales 2, 3, and 4 have yielded the most consistent and conceptually clear findings in prior analyses, these three scales were chosen as the basis for the analyses presented in this paper.

Additional data collected from all students included 1) year end achievement scores (from the previous year and the current school year), and 2) a self-concept of attainment measure (Nicholls, 1976). Teachers provided rankings of expected achievement in reading, mathematics, and schoolwork for each of their students.

To minimize the effects of variation in student reading ability, questionnaire instructions and items were read aloud to students in small group administration sessions.

Results and Discussion

The amount of perceived differential treatment occurring in each classroom was determined in four ways. For each of the three TTI scales used, the mean response given for the high target was subtracted from the mean response given for the low target, providing a classroom index of perceived differentiation specific to each scale. A median split along these difference scores determined the high and low differentiating classrooms. A fourth index, a global index, was created by combining the differentiation criteria from the three individual scales.

Because the hypotheses referred to within-classroom relationships among the variables, standardized scores within each classroom were

calculated for each variable (except for the aggregate perceived differential treatment variables), and these standardized scores were used in the analyses for this paper.

To examine the congruence between teacher expectations and student expectations in different classroom contexts, simple correlations between teacher expectations and student expectations for performance in reading, mathematics and schoolwork were calculated separately for each classroom. In the first sample, correlation coefficients were converted to standard scores, and t-tests were used to compare correlations for classrooms with high and low perceived differentiation in treatment. Mean correlations and t statistics are shown in Table 1.

Insert Table 1 about here

Because the second sample consisted of seven classrooms, Mann-Whitney U Tests were applied to compare the correlations for high and low differentiating classrooms. Mean correlations and U statistics are shown in Table 2.

Insert Table 2 about here

Although the small sample sizes (16 classrooms and 7 classrooms, respectively) limited the power of these comparisons, the tests approached significance ($p < .10$) in half of the comparisons made. The results were in the predicted direction and support the first hypothesis that the congruence between teacher and student expectations tended to be greater in classrooms with high perceived treatment differentiation than in classrooms with low perceived treatment differentiation.

Hierarchical regression analyses were performed on the first data set to test the second hypothesis that teacher expectations predict outcomes beyond what is predicted by prior achievement. Three pairs of regression analyses were calculated, one for each of the three dependent variables: student expectations for reading, student expectations for schoolwork, and year end reading achievement. In each pair of analyses, prior achievement was entered as the first predictor. Teacher expectations for reading were entered as the second predictor in the first analysis. Teacher expectations for schoolwork were entered as the second predictor in the second analysis.

Table 3 shows the percent of variance (R^2) in each dependent variable that was accounted for by prior achievement, and the percent of variance that was accounted for by teacher expectations for reading in the first equation and by teacher expectations for schoolwork in the second equation.

Insert Table 3 about here

Although prior achievement accounted for 10 to 63% of the variance in the dependent measures, teacher expectations explained an additional 2 to 7% of the variance, suggesting that teacher expectations contribute uniquely to student expectations and achievement.

To compare the predictive power of teacher expectations in high and low differentiating classrooms, similar sets of regression analyses were calculated separately for these two groups. Then, F statistics were calculated to compare the mean square residuals of the whole group analyses with the mean square residuals of the separate group analyses to

determine if the prediction equations for each dependent variable were different for the classrooms with high compared to low perceived differentiation.

Table 4 shows the percent of variance in each dependent variable accounted for by each independent variable for the high and the low differentiating classrooms.

Insert Table 4 about here

Also in Table 4 are the F statistics calculated to compare the separate regression equations for high and low differentiating classrooms. The significant F(Read) for Year End Reading on the Global Index, for example, means that when classrooms were divided by the overall amount of differentiation across all the TTI scales, and separate regression equations were calculated for each group of classrooms, the independent variables combined in significantly different ways for each group of classrooms to predict year end reading achievement.

In each of these cases, prior achievement and teacher expectations did not simply allow greater overall predictive power in high than in low differentiating classrooms. Each separate regression equation predicted similar percentages of total variance in the dependent variables. Instead, the patterns of R^2 values in Table 4 indicated that prior achievement tended to be a better predictor in low than in high differentiating classrooms, and teacher expectations tended to be more powerful predictors in high than in low differentiating classrooms.

Thus, classrooms with low perceived differentiation, where we

hypothesize that little information about differential student ability is communicated by the teacher, student achievement was best predicted by a previous measure of achievement, accounting for 64 to 77% of the variance in the dependent measure. In other words, students continued to perform at about the same levels, relative to their classmates, as they had performed before. In contrast, in classrooms with high perceived differentiation, where we hypothesize that teachers give more differential information about students' abilities, student achievement was less effectively predicted by prior achievement, accounting for 47 to 62% of the variance in the dependent measure. In these high differentiating clasrooms, teachers' expectations explained an additional 9 to 18% of the variance in student achievement, whereas teacher expectations explained only an additional 1 to 4% of achievement variance in low differentiating classrooms. Similar patterns of results occurred for predictions of student expectations for their own performance.

These findings contradict Cooper's (1979) conclusion that teacher expectations only "sustain the pre-existing achievement variations among students" (p. 392), but do not alter student performance. If this were true, we would expect prior achievement measures to predict the same amount of variance in year end achievement in both high and low differentiating classrooms, and for teacher expectations to explain additional variance only in classrooms with high perceived differentiation. Our results do not conform to this pattern. Instead, our findings are consistent with the hypothesis that teachers behave in ways that communicate their achievement expectations to their students -- expectations that may deviate from a student's prior achievement, that students perceive these expectations from their teachers' behavior, that these

expectations influence students' own expectations, and that students achieve at the expected levels.

The different predictive patterns in high and low differentiating classrooms show that student perceptions of differential teacher behavior toward high and low achievers can serve as moderators of relationships between the independent variables measured and the achievement outcomes predicted. Students' perceptions of differential teacher behavior can be further validated by demonstrating relationships between students' own achievement levels and their reports of how their teachers work with them. Three studies have already shown consistent differences in the ways students perceive that teachers work with high and low achievers on three scales of the TTI (Weinstein & Middlestadt, 1979; Brattesani & Weinstein, Note 2; Weinstein, Middlestadt, Brattesani, & Marshall, Note 3). Students said that low achievers received more negative feedback and teacher direction (Scale 2), and more work and rule oriented teacher behaviors (Scale 3) than high achievers, and that high achievers received higher expectations, more opportunities to participate and more choice of tasks (Scale 4) than low achievers. If hypothesis 3 is correct, high and low achievers themselves should perceive teacher behaviors toward them that are similar to the teacher behaviors reported for a high and low achieving target, respectively.

The correlations of TTI: Self-rating scales 2, 3, and 4 with achievement scores and teacher expectations for reading and schoolwork were based on the second sample and are shown in Table 5.

Insert Table 5 about here

This table shows that the scale scores are not significantly correlated with achievement scores, but that scales 2 and 4 are related to teacher expectations in the appropriate directions. That is, low expectation students perceived more negative feedback and teacher direction, and high expectation students perceived higher teacher expectations, more opportunities to participate and choice of tasks.

To test hypothesis 4, that these reationships hold for high differentiating classrooms more than for low differentiating classrooms, these same correlations were calculated for high and low differentiating classrooms separately. Table 5 shows that the appropriate relationships between scale scores and achievement measures were more pronounced in high differentiating classrooms than in the entire sample. In addition, Scale 3, describing teacher work and rule oriented behaviors, tended to be reported more (although not significantly so) by low achievers, again consistent with student reports of teacher behavior reported toward high and low achieving targets. In low differentiating classrooms, student perceptions of treatment toward self were not significantly related to achievement or teacher expectation measures. However, the direction of the relationships for scales 3 and 4 suggest quite a different pattern of reported teacher treatment toward self. In these low differentiating classrooms, high achievers tended to report more work and rule oriented behaviors, and low achievers reported higher expectations. The contrast in these relationships for high and low differentiating classrooms explains the lack of significant relationships found between achievement and perceived treatment toward self when data from all classrooms were analyzed together.

Summary and Future Research

Consistent with the hypothesis that students in classrooms with high perceived differentiation have access to more information about their teachers' expectations for them, we have shown that students in these classrooms have expectations for themselves that are more strongly related to their teachers' expectations than students in low differentiating classrooms. As well, student achievement in high differentiating classrooms is more strongly related to teacher expectations and less strongly related to prior achievement than in low differentiating classrooms. In addition, we have demonstrated that high and low achievers perceive teacher behaviors toward themselves that is congruent with students' perceptions of teacher behavior toward high and low achieving target students, particularly in classrooms with high perceived differentiation. The findings for self treatment demonstrate that students have access to information about their own abilities that is communicated to them by their teachers. These findings also provide one source of validation for the differential teacher treatment perceived by students.

Thus far, we have aggregated student perceptions of teacher behavior to provide a situational variable describing the amount of perceived differential treatment in a classroom context, and have examined whether perceptions of differential teacher treatment moderate relationships at the individual student level among teacher expectations, student perceptions of teacher behavior toward self, and student achievement outcomes. Among the questions still to be asked of these data sets and to be asked in future research are those concerning the individual

differences among students that might moderate teacher-student influence. What characteristics, for example, make students more or less adept at obtaining information about their abilities from their teachers' behavior, and more or less susceptible to the influence of teacher expectations? As well, for which students might perceptions of teacher treatment toward self predict achievement? Finally, relationships between student achievement levels and perceived self treatment reported in this paper suggest more than one possible pattern of differential teacher treatment. A goal for future research is to identify classroom differences in the amount of congruence between perceived teacher treatment toward self and others, in order to develop more refined typologies of the classroom contexts in which students might learn differently about their competencies and develop their expectations for academic success.

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Table 1

Mean Correlations between
Teacher Expectations and Student Expectations
for Student Performance in
Reading, Math, and Schoolwork
— First Sample —

	High Differentiating N=8		Low Differentiating N=8		t statistic*	Significance level, one-tailed test
	Mean r	S.D.	Mean r	S.D.		
Reading	.52	.24	.30	.31	1.54	p = .07
Math	.38	.33	.24	.32	.87	p = .20
Schoolwork	.37	.40	.40	.22	.15	p = .44

*T-tests performed on standard scores calculated from the correlations.

Table 2

Mean Correlations between
Teacher Expectations and Student Expectations
for Student Performance in
Reading, Math, and Schoolwork
-- Second Sample --

	High Differentiating N=3		Low Differentiating N=4		Mann-Whitney U staistic	Significance level, one-tailed test
	Mean r	S.D.	Mean r	S.D.		
Reading	.50	.37	.17	.27	3	p = .20
Math	.36	.21	.03	.17		p = .057
Schoolwork	.49	.40	.07	.22	1	p = .057

Table 3

Percent of Variance (R^2) in Student Expectations and Achievement Accounted for by Prior Reading Achievement, and Teacher Expectation Measures

Independent Variables	Order of Entry in Hierarchical Regression Analyses	Dependent Variables (N=196)		
		Student Expectations Reading	Student Expectations Schoolwork	Year End Reading Achievement
Prior Achievement Reading	1st	.17**	.10***	.63***
Teacher Expectations Reading	2nd	.02*	.04**	.07***
Teacher Expectations Schoolwork	2nd (in separate analyses)	.04**	.06***	.07***

*p < .05, **p < .01, ***p < .001.

Table 4

Percent of Variance (R^2) in Student Expectations and Achievement Accounted for by Prior Reading Achievement, and Teacher Expectations in High and Low Differentiating Classrooms

Differentiation Determined by:	N		Independent Variables	Order of Entry in Hierarchical Regression Analyses	Dependent Variables (N=196)					
					Student Expectations				Year End Reading Achievement	
					Reading		Schoolwork			
	High	Low			Hi Diff	Lo Diff	Hi Diff	Lo Diff	Hi Diff	Lo Diff
Global Index	103	93	Prior Ach R	1	.17***	.17***	.06*	.14***	.57***	.68***
			T Exp Read	2	.07**	.002	.10**	.01	.14***	.03**
			T Exp SWork	2	.06**	.02	.12***	.03	.16***	.03**
			F(Read)		1.03, ns		1.53, ns		3.12*	
			F(SWork)		.30, ns		1.17, ns		3.84*	
Scale 2	99	97	Prior Ach R	1	.15***	.20***	.05*	.16***	.62***	.64***
			T Exp Read	2	.06**	.004	.08**	.01	.09***	.05***
			T Exp SWork	2	.05*	.03*	.08**	.05*	.10***	.05***
			F(Read)		.92, ns		1.29, ns		1.25, ns	
			F(SWork)		.19, ns		.84, ns		1.36[a]	
Scale 3	99	97	Prior Ach R	1	.09**	.27***	.06*	.14***	.47***	.77***
			T Exp Read	2	.13***	.003	.12***	.001	.16***	.01**
			T Exp SWork	2	.13***	.001	.16***	.01	.18***	.01*
			F(Read)		4.50**		2.29[a]		6.16**	
			F(SWork)		2.94*		1.94, ns		6.46**	
Scale 4	118	78	Prior Ach R	1	.14**	.19***	.03	.18***	.59***	.65***
			T Exp Read	2	.05*	.01	.12**	.01	.13***	.04***
			T Exp SWork	2	.05*	.03	.13**	.04*	.17***	.03**
			F(Read)		.50, ns		2.80*		2.03, ns	
			F(SWork)		.20, ns		2.39[a]		3.17*	

[a]p < .10, *p < .05, **p < .01, ***p < .001.

Table 5

Correlations of TTI: Self-rating Scales with Achievement Scores and Teacher Expectations for All Classrooms and for High and Low Differentiating Classrooms Separately

	TTI: Self-rating Scale	N	Prior Achievement Reading	Year End Achievement Reading	Teacher Expectations Reading	Teacher Expectations Schoolwork
All Classrooms	2	82	-.07	-.04	-.14	-.23*
	3	82	.03	.05	.14	.09
	4	82	.00	-.09	.13	.21¤
High Differentiating Classrooms	2	39	-.32*	-.22	-.32*	-.29¤
	3	39	-.17	-.05	.06	.11
	4	48	.17	-.03	.25¤	.22
Low Differentiating Classrooms	2	43	.08	.16	-.04	-.19
	3	43	.12	.21	.21	.08
	4	34	-.22	-.19	-.02	.19

¤$p < .10$, *$p < .05$.

Note: Positive correlations indicate that high achievers reported more of the teacher behavior included on the TTI scale.