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**"Productivity of Public School Districts  
The Employment Relations Model"**

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# PRODUCTIVITY OF PUBLIC SCHOOL DISTRICTS

## The Employment Relations Model

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In recent years, many American companies have responded to sharply rising international and domestic competition by adopting innovative workplace arrangements such as self-managing work teams, total quality management, and computer-aided design and manufacturing (CAD-CAM). These arrangements require a workforce with strong mathematical, technical, and communication skills (Carnevale & Carnevale, 1993). Yet there is evidence that America's K-12 public schools are not adequately preparing our youth for the modern workplace. Reports such as *A Nation at Risk* (National Commission on Excellence in Education, 1983), *A Nation Prepared* (Carnegie Forum on Education and the Economy, 1986), and the Secretary's Commission on Achieving Necessary Skills (1991) have convinced policymakers, educators, and business leaders that public schools must improve their ability to provide young people with the skills needed to succeed in today's workplaces. Moreover, a highly skilled workforce is mandatory if American economic competitiveness is to be ensured.

Currently, the public policy question is not whether America's public schools need reforming. Rather, the debate centers on what types of reforms should be carried out. Reform policies can be made more effective if there is an understanding of the determinants of public school productivity. Toward this goal, our purpose is to proffer a new approach to studying the determinants of public school district productivity. This approach, the "employment relations" (ER) model, posits that the productivity of a school district is influenced strongly by the district's employment relations system—the policies, practices, and actions that govern relations between a district and its teachers.

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This article explicates the initial development and testing of the ER model. The discussion begins with an examination of the theoretical foundation for the model, followed by an explanation of data used to test the model. We then present results that demonstrate that districts with effective employment relations exhibited high productivity as measured by the student pass rate on a standardized test and the student retention rate. These findings were obtained after controlling for student socioeconomic status (SES), per student instructional expenditures, the adequacy of school physical facilities, and teacher qualifications. At the end of the article, we seek to broaden the scope of public policy debates about education reform by suggesting that educational productivity can be enhanced not only by improving instructional techniques (the emphasis of curriculum reform programs) or by increasing the financial resources schools have at their disposal (the emphasis of school funding reform programs) but also by improving the effectiveness with which school administrators manage employment relations with teachers. The following section locates the ER model in the context of the existing literature and explains how the model differs from previous paradigms in research on school productivity.

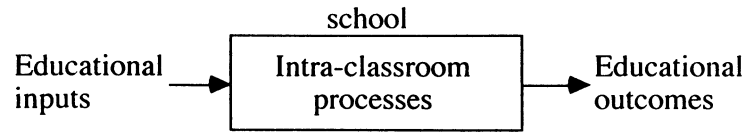
### **Dominant Paradigms in Research on School Productivity**

Figure 1 depicts the education and economic paradigms that historically have dominated research on school productivity and contrasts them with the ER model. Educational researchers have provided the dominant paradigm in research on school productivity. The majority of their research has concentrated on the instructional efficacy of the student-teacher interface. As discussed by Brophy, (1986), Edmonds (1983), Good and Weinstein (1986), Purkey and Smith (1983), and Rutter (1983), determinants of instructional efficacy are teaching techniques, school facilities, teacher behaviors, teacher development, and support staff. A second paradigm has been put forward by economists. Their work has used the "production function" idea to investigate the determinants of school productivity. In this vein, economists and other researchers such as Glasman and Biniaminov (1981); Hanushek et al. (1994); Hedges, Laine, and Greenwald (1994); Heinbuch and Samuels (1995); Levin (1970); Murnane (1981); and Summers and Wolfe (1977) studied the combination of educational inputs—such as instructional expenditures, teacher salary, and teacher education—that produce educational outputs such as student performance on standardized tests.

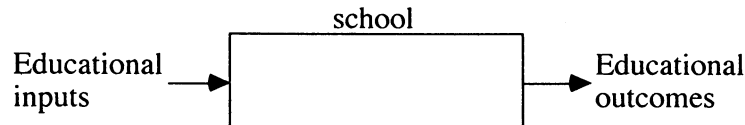
Educational and economic paradigms have yielded a wealth of excellent work on the determinants of school productivity. Yet these paradigms have been limited by the research questions stemming from their respective theoretical viewpoints. They have neglected some important research questions concerning the functioning of school districts as organizations (Bidwell & Kasarda, 1975) such as the role of a district's intraorganizational employment relations system.

### **The ER Model**

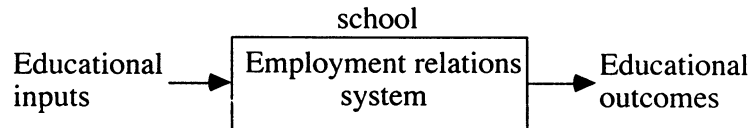
The theoretical backdrop for the ER model is a growing body of literature on how human resource management and labor relations practices affect organizational pro-

1. Education.

Educational inputs that determine educational outcomes: (1) instructional techniques, (2) facilities, (3) teacher behaviors, and (4) teacher experience.

2. Economics.

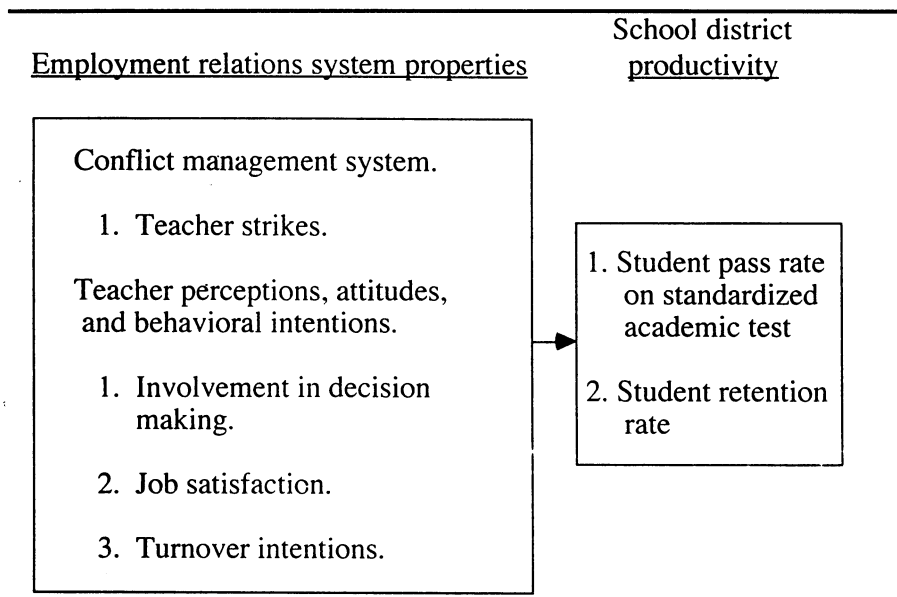
Educational inputs that determine educational outcomes: (1) school finance (e.g., instructional expenditures) and (2) teacher salary.

3. Employment relations.

Educational inputs that determine educational outcomes: (1) administrator-teacher conflict, (2) teacher involvement in school-based governance structures, (3) teacher job satisfaction, and (4) teacher turnover.

**Figure 1: School Productivity: Three Paradigms**

ductivity (Appelbaum & Batt, 1993; Bailey, 1992; Cappelli & Singh, 1992; Ichniowski, Shaw, & Prennushi, 1994; Katz & Keefe, 1992; Katz, Kochan, & Gobeille, 1983; Katz, Kochan, & Weber, 1985; McDuffie, 1995). The theoretical logic of this research is as follows. Employment relations practices concern employee hiring, training, job assignments, evaluation, compensation, promotion, and collective bargaining. These practices form the employment relations "system" that governs the quality of relations between the organization and its employees (Dunlop, 1993). Examples of indicators of effective employment relations systems are effective conflict management



**Figure 2: Employment Relations Systems Properties and School District Productivity**

by managers and employees, employee involvement in organizational decisions, and positive employee attitudes such as high job satisfaction and strong organizational commitment (Bailey, 1992). The impact of effective employment relations on organizational productivity, which is defined similarly to organizational effectiveness as attainment of an organization's goals and objectives (Steers, 1977), is attributed to enhanced employee job performance stemming from effective employment relations. Empirical research findings have indicated that effective employment relations practices yield high levels of employee job performance (Cascio, 1992).

#### **APPLYING THE ER MODEL TO PUBLIC SCHOOL DISTRICTS**

In the original ER model, Katz et al. (1985) proposed two indicators of the quality of employment relations systems: (a) the mechanism through which management and employees manage their conflict and (b) employee perceptions, attitudes, and behavioral intentions. As depicted in Figure 2, the ER model used in the present study applied the same two indicators to the school district context: (a) administrator-teacher conflict management and (b) teacher perceptions, attitudes, and behavioral intentions. These two indicators do not form an exhaustive list of indicators, yet they make up the two central aspects of the quality of employment relations in school districts. School district productivity was assessed as a two-dimensional construct (cf. Steers, 1977) in terms of "cognitive" and "noncognitive" student outcomes, namely the average pass rate of students on a standardized academic competency test and student retention (non-dropout) rate. These are typical productivity indicators in research on educational organizations (Glasman & Biniaminov, 1981).

It is worth noting that, although previous researchers have studied employment relations in public education (Johnson, 1983; Kerchner & Mitchell, 1988; Shedd &

Bacharach, 1991), the present model posits that it is the *quality* of employment relations that affects school district productivity (see also Currall, 1992; Currall & Judge, 1995). Additionally, teacher work-related perceptions, attitudes, and behavioral intentions are central to the model because they are important determinants of teacher job performance (Glasman & Biniaminov, 1981). Although “secondary” resources (such as school facilities) influence school productivity, teacher job performance is the “primary” resource affecting school productivity (Hanushek et al., 1994; Murnane, 1981).

In testing the ER model, we controlled for four important school district characteristics that previous work (Glasman & Biniaminov, 1981) had shown to explain productivity differentials across districts: (a) student background characteristics, in the form of student SES (Coleman et al., 1966); (b) district financial resources, in the form of instructional expenditures per student (Hedges et al., 1994); (c) the adequacy of school physical facilities (Summers & Wolfe, 1977); and (d) teacher qualifications, represented by the academic training received by teachers (Hanushek et al., 1994). These were important controls because districts that have the advantage of high SES students, high per pupil expenditures, excellent physical facilities, and highly trained teachers are likely to exhibit greater productivity when compared to less advantaged districts.

#### HYPOTHESES

The first indicator of the quality of employment relations is the degree to which administrators and teachers effectively manage their conflicts. Poor conflict management is indicative of an ineffective employment relations system. Failed conflict management is associated with decreased organizational productivity (Katz et al., 1985) because failed conflict management “aftermaths” sour the climate of administrator-teacher relations and leave residuals of distrust and hostility along with their accompanying delays, deadlocks, and inefficiencies in decision making (Thomas, 1976). The present study examined unionized school districts. Collective bargaining, therefore, was a typical mechanism for administrator-teacher conflict management. Because a teacher strike is a joint product of administrators and teachers—a strike is often as much a function of intransigence by administrators as it is a function of militancy by teachers—a teacher strike was used as an indicator of failed conflict management.

Hypothesis 1a: Teacher strikes will be negatively related to the student pass rate on a standardized test of academic competency.

Hypothesis 1b: Teacher strikes will be negatively related to the student retention rate.

The second indicator of employment relations quality is the category of work-related perceptions, attitudes, and behavioral intentions of teachers. Active teacher involvement, high teacher job satisfaction, and teachers who intend to maintain their employment in public education are indicators of effective employment relations. Districts characterized by ineffective employment relations are characterized by little teacher involvement in decision making, low teacher job satisfaction, and teachers who intend to seek employment elsewhere. Hypotheses regarding the impact of teacher involvement, job satisfaction, and turnover intentions on school district productivity

are based on research findings obtained in various organizational settings showing that (a) employee involvement is associated with enhanced organizational productivity because employees' knowledge contributes to improved organizational decision making and enhanced employee commitment to implementing decisions (Wagner, 1994), (b) job satisfaction is associated with enhanced organizational productivity because satisfaction leads to multiple performance-related behaviors such as increased work effort and reduced absenteeism (Organ, 1988; Ostroff, 1992; Roznowski & Hulin, 1992), and (c) turnover intentions are associated with decreased organizational productivity because they are symptomatic of psychological withdrawal from the job and its resultant performance decrements from lateness, avoidance of work, and low job effort (Hanisch & Hulin, 1990; Ostroff, 1992).

Hypothesis 2a: Teacher involvement in decision making will be positively related to the student pass rate on a standardized test of academic competency.

Hypothesis 2b: Teacher involvement in decision making will be positively related to the student retention rate.

Hypothesis 3a: Teacher job satisfaction will be positively related to the student pass rate on a standardized test of academic competency.

Hypothesis 3b: Teacher job satisfaction will be positively related to the student retention rate.

Hypothesis 4a: Teacher turnover intentions will be negatively related to the student pass rate on a standardized test of academic competency.

Hypothesis 4b: Teacher turnover intentions will be negatively related to the student retention rate.

In addition to the ER model, we have included two exploratory measures of employment relations systems quality not in Katz's original ER model, namely teacher perceptions of the adequacy of (a) programs for teacher performance evaluation and (b) programs for teacher professional development. These measures were included to broaden the range of variables used to measure employment relations systems quality. Districts with effective employment relations will be characterized by better performance evaluation and professional development programs relative to districts with unproductive employment relations. If the caliber of these programs is found to be associated with district productivity, this would suggest that one specific way to enhance school district productivity would be to train school administrators to emphasize the effectiveness of these programs. Previous research has shown associations between adequate performance evaluation and organizational productivity because of clarification of employee goals and delivery of diagnostic feedback that facilitates improved job performance (Landy & Farr, 1983). Also, previous research has indicated that organizational productivity is affected by employee professional development (training) (Carnevale & Goldstein, 1990) because of improved employee job knowledge, leadership skills, ability to use new technology, and reductions in performance errors (Burke & Day, 1986). Because of their exploratory nature, tests of Hypotheses 5 and 6 are conducted separately from tests of the main ER model.

Hypothesis 5a: The adequacy of teacher performance evaluation will be positively related to the student pass rate on a standardized test of academic competency.

Hypothesis 5b: The adequacy of teacher performance evaluation will be positively related to the student retention rate.

Hypothesis 6a: The adequacy of teacher professional development will be positively related to the student pass rate on a standardized test of academic competency.

Hypothesis 6b: The adequacy of teacher professional development will be positively related to the student retention rate.

## Method

### DATA

Data were obtained on 180 public school districts in Pennsylvania. Within these 180 districts, data were available from 63 districts from the academic year 1987-1988, 52 districts from 1988-1989, and 65 districts from 1989-1990. Data were cross-sectional; no district contributed data from more than 1 year. Districts ranged in size from 420 to 12,451 students ( $M = 3,091$ ,  $SD = 2,117$ ).

The Pennsylvania Department of Education provided data on district productivity—the average pass rate of a district's students on an academic competency test and the student retention rate, which we computed from the percentage of a district's students who dropped out of school. (We used retention rate, rather than dropout rate, to simplify our hypotheses.) Data from the Pennsylvania Department of Education also provided measures of student SES, instructional expenditures per student, and the measure of teacher strikes.

Survey data on teacher perceptions, attitudes, and behavioral intentions were obtained from annual surveys administered within districts. Surveys were administered by the Pennsylvania State Education Association (PSEA) as part of a larger study of educational professionals. A PSEA representative (such as the local union president) in each district distributed the surveys. Surveys were administered to all teachers and educational professionals in the school district (regular classroom teachers, special education teachers, vocational/technical teachers, guidance counselors, psychologists, nurses, librarians, therapists, and dental hygienists). Creation of the survey measures was based on extensive psychometric analyses of the survey scales by Hofmann, Mathieu, and Jacobs (1990). On the basis of confirmatory factor analyses (LISREL) using separate samples of 3,724 and 3,037 Pennsylvania public school teachers, Hofmann et al. (1990) showed that the survey items significantly loaded on their hypothesized factors, the number of factors were the same across both samples, and the items loaded on the same factors across both samples.

In tests of the ER model using standardized test pass rate as the productivity measure, we used survey responses from elementary and junior high school classroom teachers; senior high school teachers were excluded. Because the standardized test was administered to third-, fifth-, and eighth-grade students, inclusion of survey responses from elementary and junior high school teachers allowed us to capture the impact of both "proximate" (current) and "previous" teachers (Monk & King, 1994) on student test scores. The average survey response rate per school district was 60.2%, and the average number of respondents per school district was 57. The total number of respondents across all 180 districts was 10,308. Among the respondents, 73% were female and the average age was 41.

Alternatively, in tests of the model using retention rate as the productivity measure, we used a slightly different set of survey respondents. Because a student's decision to drop out may be influenced by a variety of educational professionals, we used survey responses from classroom teachers, vocational/technical teachers, guidance counselors, and psychologists. Within this sample, 86.3% were classroom teachers, 9.1% were vocational/technical teachers, 4.5% were guidance counselors, and 0.1% were psychologists. Survey responses from educational professionals who worked in elementary school settings were excluded because they were believed to have a negligible impact on a student's decision to drop out in junior or senior high school. The average survey response rate per school district was 60.1%, and the average number of respondents per school district was 45. The total number of respondents across all 180 districts was 8,081. Among these respondents, 46% were female and the average age was 42.

#### MEASURES

**School district productivity.** The Pennsylvania Department of Education annually administered the Test of Essential Learning and Literacy Skill to all third-, fifth-, and eighth-grade public school students. In a given year, the test was administered to approximately 400,000 students. It was a standardized criterion-referenced test of basic reading and math competency. A passing score depended on the grade level but ranged from 66% to 71% correct answers, which was approximately 15 percentage points below the national average for these test items (Pennsylvania Department of Education, 1987). A major advantage of using this test as an indicator of school district productivity was that the test contained no self-selection bias; it was administered to all third-, fifth-, and eighth-grade students in each district. The absence of self-selection bias in this test contrasts with substantial self-selection bias inherent in common achievement tests, such as the Scholastic Aptitude Test (SAT), that often have been used as educational outcome measures. The SAT suffers from self-selection bias because it is taken by only college-bound high school students (Hanushek & Taylor, 1990).

To create a measure of the academic competency of each district's students, we computed a district's mean score of six pass rates—third graders' pass rates on both components (reading and math), fifth graders' pass rates on both components, and eighth graders' pass rates on both components. The overall mean of these six pass rates for each district, which we labeled TEST, was used as the measure of the academic competency of a district's students.

Concerning the student retention rate, each district must submit an annual report to the Pennsylvania Department of Education indicating the number of students in grades 7 through 12 who dropped out. Dropouts were distinguished from students who simply moved to other school districts. For each district, the dropout percentage was based on the number of students who dropped out in an academic year divided by the number of students in the district. To create the measure of student retention percentage, RETAIN, we computed 100 minus the dropout percentage.

**Controls.** Students' SES was the mean of annual personal income of households within a school district (in 1988 dollars) divided by the number of students in the

district. INSTEXP was the district's annual instructional expenditures (in 1988 dollars) divided by the number of students in the district. The adequacy of a district's physical facilities, FACIL, was a three-item survey measure of teacher perceptions of the adequacy of physical facilities (school buildings and classrooms). The measure of teacher qualifications, QUALIF, came from a survey item in which teachers indicated their highest academic degree (1 = associate degree, 2 = bachelor's degree or equivalent, 3 = additional credits above bachelor's degree, 4 = master's degree or equivalent, and 5 = Ph.D. or Ed.D.).

*Employment relations.* STRIKE was based on Pennsylvania Department of Education records of teacher strike days. These data were used to calculate the sum of days that a district's teachers were on strike during the 8 years prior to collection of school district productivity data. This time frame was chosen because eighth-grade students taking the final administration of the test had been attending the district's schools for 8 years. INVOLVE was a six-item survey measure of teacher involvement in decision making (such as formal participation, informal participation, and freedom to express dissenting views). JOBSAT was a six-item measure of both intrinsic and extrinsic job satisfaction (such as satisfaction with personal fulfillment from job, with pay, and with opportunities for career advancement) (Weiss, Dawis, England, & Lofquist, 1967). TURNIN was a three-item measure of intentions to find employment in a field other than public education. EVALAD was a three-item measure of the adequacy the performance evaluation program. PROFDEV was a two-item measure of the adequacy of professional development programs.

For the teacher survey scales, it was necessary to compute coefficient alphas to examine the internal consistency of the scales. Also, because we wished to use aggregated teacher survey responses as within-district measures of teacher perceptions, attitudes, and behavioral intentions, evidence of homogeneity of survey responses within school districts was required (Ostroff, 1992). We used two intraclass correlations (ICCs) to test quantitatively whether the degree of within-district homogeneity warranted aggregation at the district level. ICC(1) and ICC(2) address different properties of aggregate (within-district) scores (James, 1982). ICC(1) indicates the agreement of individual survey respondents within a given school district by comparing the between-district sum of squares to the total sum of squares from a one-way analysis of variance where the school district is specified as the independent categorical variable. ICC(2) is a measure of the aggregate-level reliability of mean scores within a given school district; it is the correlation between mean scores of two samples of teacher survey respondents drawn from a single school district.

## Results

Table 1 contains descriptive statistics, coefficient alphas, and ICCs for all variables including separate presentation of results based on survey data used in analyses with TEST as the measure of productivity and survey data used in analyses with RETAIN as the measure of productivity. Coefficient alphas all were above the rule-of-thumb value of .70 (Nunnally & Bernstein, 1994). Historically, ICC(1) values have ranged from 0 to .5 with a median of .12. ICC(2) values should be .6 or higher (Ostroff & Schmitt, 1993). The ICCs were within the acceptable range, although ICC(1) values

Table 1. Descriptive Statistics, Coefficient Alphas, and Intraclass Correlations for Variables Used in Tests of the ER Model (N = 180 school districts)

| Variable | Mean   | SD     | Minimum | Maximum | Alpha | ICC(1) | ICC(2) |
|----------|--------|--------|---------|---------|-------|--------|--------|
| TEST     | 85.74  | 6.93   | 52.17   | 97.22   |       |        |        |
| RETAIN   | 98.00  | 1.22   | 90.51   | 100.00  |       |        |        |
| SES      | 70,111 | 47,705 | 23,564  | 506,221 |       |        |        |
| INSTEXP  | 3,459  | 694    | 2,404   | 7,231   |       |        |        |
| FACIL    | 4.41   | .51    | 2.54    | 5.48    | .74   | .15    | .91    |
| QUALIF   | 3.73   | .31    | 2.70    | 4.84    |       |        |        |
| STRIKE   | 6.23   | 11.57  | 0       | 55      |       |        |        |
| INVOLVE  | 3.62   | .33    | 2.56    | 4.53    | .81   | .10    | .86    |
| JOBSAT   | 3.97   | .34    | 2.69    | 4.62    | .77   | .12    | .89    |
| TURNIN   | 2.13   | .30    | 1.50    | 3.80    | .89   | .03    | .63    |
| EVALAD   | 4.37   | .34    | 3.26    | 5.07    | .75   | .09    | .85    |
| PROFDEV  | 3.10   | .42    | 2.02    | 4.17    | .78   | .15    | .91    |

Note. ER = employment relations; ICC = intraclass correlation. Where two figures are shown (for all survey measures), figures used in tests of the ER model with TEST as the productivity measure are listed first; figures used in tests of the ER model with RETAIN as the productivity measure are listed second. TEST and RETAIN are percentages, SES and INSTEXP are dollars per student, STRIKE is number of days, QUALIF is measured on a 1-to-5 survey response scale, and all other variables are measured on a 1-to-6 survey response scale.

were somewhat low for TURNIN. Overall, the ICC(1) and ICC(2) values indicated acceptable levels of within-district homogeneity. Therefore within-district means of teacher survey responses were used in all tests of the ER model.

#### TESTS OF THE ER MODEL

Zero-order correlations are reported in Table 2. Correlations between individual measures of employment relations supported the unity of employment relations systems. As expected, measures of effective employment relations (INVOLVE, JOBSAT, EVALAD, and PROFDEV) were positively correlated with each other. Measures of ineffective employment relations (STRIKE and TURNIN) were positively correlated with each other as well. And, as expected, measures of effective employment relations were negatively correlated with measures of ineffective employment relations.

Consistent with hypothesized relationships in the ER model, significant positive correlations were found between TEST and INVOLVE and between TEST and JOBSAT. TEST showed the expected significant negative correlations with STRIKE and TURNIN. TEST was positively correlated with the exploratory employment relations measures, EVALAD and PROFDEV. Also consistent with the model, RETAIN showed significant negative correlations with both STRIKE and TURNIN. No other employment relations variables were significantly correlated with RETAIN. Overall, these correlations provided preliminary support for Hypotheses 1a, 1b, 2a, 3a, 4a, 4b, 5a, and 6a.

The primary tests of the ER model were conducted in a series of regression analyses. Ordinary least squares (OLS) regression was used throughout. In analyzing the model, hierarchical OLS regression used two sets of predictors: (a) the control variables in step 1 and (b) the employment relations variables in step 2. A significant  $R^2$  at step 2 would indicate that the employment relations variables contributed to school district productivity after accounting for the effects of the control variables.

Table 3 presents hierarchical regression results in which TEST was regressed on the controls and employment relations variables. With respect to step 2, Table 3 shows a significant increment in the prediction of TEST with the addition of the employment relations variables. With employment relations variables,  $R^2$  increased from .22 to .33. This .11 increment in  $R^2$  was significant,  $F(4, 171) = 7.02, p < .01$ , providing support for the central idea in the ER model, namely that the quality of employment relations affects school district productivity. Concerning the individual employment relations variables, the results were partially supportive. INVOLVE and JOBSAT showed significantly positive regression coefficients with TEST. Hypotheses 2a and 3a were therefore supported; districts with relatively high test pass rates were districts characterized by active teacher involvement in decision making and high teacher job satisfaction. STRIKE and TURNIN showed the hypothesized negative coefficients with TEST, yet they failed to reach significance. Hypotheses 1a and 4a were not supported.

Regarding the other indicator of district productivity, RETAIN, hierarchical regressions analogous to those for TEST were carried out. Table 3 shows the results. Introduction of the employment relations variables in step 2 accounted for an increment in the variance in RETAIN from .04 to .08. Beyond the controls, this .04

Table 2. Correlations

|            | 1 | 2     | 3     | 4     | 5     | 6    | 7     | 8     | 9     | 10    | 11    | 12    |
|------------|---|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|
| 1 TEST     | — |       | .43*  | .24*  | .20*  | .20* | -.16* | .38*  | .42*  | -.33* | .14*  | .19*  |
| 2 RETAIN   | — | —     |       | .69*  | .08   | .34* | -.09  | .14*  | .24*  | -.17* | .08   | .21*  |
| 3 SES      | — | .19*  | —     | —     | -.03  | .38* | .01   | -.04  | .21*  | -.22* | .00   | .25*  |
| 4 INSTEXP  | — | .07   | .69*  | —     | —     | .02  | -.11  | .33*  | .37*  | .00   | -.07  | -.01  |
| 5 FACIL    | — | .00   | .07   | -.01  | —     | .02  | -.02  | .12   | .30*  | -.24* | .14*  | .12   |
| 6 QUALIF   | — | .07   | .50*  | .54*  | .02   | —    | .02   | .12   | .30*  | -.24* | .14*  | .12   |
| 7 STRIKE   | — | -.13* | -.09  | .01   | -.13* | .07  | —     | -.29* | -.17* | .15*  | -.15* | -.10  |
| 8 INVOLVE  | — | -.04  | .00   | -.10  | .27*  | -.07 | -.09  | —     | .55*  | -.38* | .55*  | .42*  |
| 9 JOBSAT   | — | .06   | .21*  | .24*  | .26*  | .17* | -.08  | .50*  | —     | -.62* | .34*  | .37*  |
| 10 TURNIN  | — | -.15* | -.18* | -.20* | -.18* | -.13 | .07   | -.30* | -.64* | —     | -.28* | -.28* |
| 11 EVALAD  | — | -.01  | -.04  | -.08  | .20*  | -.11 | -.06  | .61*  | .39*  | -.32* | —     | .30*  |
| 12 PROFDEV | — | -.02  | .10   | .08   | .14*  | .04  | -.01  | .56*  | .41*  | -.24* | .40*  | —     |

Note. Correlations among variables used in tests of the employment relations (ER) model with TEST as the effectiveness measure are above the diagonal; correlations among variables used in tests of the ER model with RETAIN as the effectiveness measure are below the diagonal.

\* $p < .05$ , two-tailed.

**Table 3. Hierarchical Regression Results With TEST and RETAIN as Dependent Variables**

|  | Beta | t      | R <sup>2</sup> | F       | ΔR <sup>2</sup> |
|--|------|--------|----------------|---------|-----------------|
| Dependent variable: TEST               |      |        |                |         |                 |
| Step 1: Controls                       |      |        | .22            | 12.44** |                 |
| SES                                    | .41  | 4.62** |                |         |                 |
| INSTEXP                                | -.10 | -1.05  |                |         |                 |
| FACIL                                  | .01  | 0.16   |                |         |                 |
| QUALIF                                 | .00  | -.06   |                |         |                 |
| Step 2: Employment relations variables |      |        | .33            | 10.64** | .11**           |
| STRIKE                                 | -.02 | -0.38  |                |         |                 |
| INVOLVE                                | .17  | 2.14*  |                |         |                 |
| JOBSAT                                 | .19  | 2.01*  |                |         |                 |
| TURNIN                                 | -.09 | -1.14  |                |         |                 |
| Dependent variable: RETAIN             |      |        |                |         |                 |
| Step 1: Controls                       |      |        | .04            | 2.05*   |                 |
| SES                                    | .26  | 2.43** |                |         |                 |
| INSTEXP                                | -.16 | -1.44† |                |         |                 |
| FACIL                                  | -.04 | -0.51  |                |         |                 |
| QUALIF                                 | .02  | .20    |                |         |                 |
| Step 2: Employment relations variables |      |        | .08            | 1.94*   | .04             |
| STRIKE                                 | -.12 | -1.54† |                |         |                 |
| INVOLVE                                | -.09 | -1.04  |                |         |                 |
| JOBSAT                                 | -.01 | -0.13  |                |         |                 |
| TURNIN                                 | -.17 | -1.78* |                |         |                 |

Note. Beta = standardized regression coefficient.  
 † $p < .10$ ; \* $p < .05$ ; \*\* $p < .01$ . Significance levels of regression coefficients are one-tailed.

increment in  $R^2$  approached but failed to reach marginal significance,  $F(4, 171) = 1.86$ ,  $p < .12$ . TURNIN showed the expected significant negative coefficient with RETAIN. This was support for Hypothesis 4b; districts with relatively high student retention rates were districts whose teachers were not looking for employment elsewhere. The coefficient for STRIKE reached the  $p < .0624$  level of significance. This was marginal support for Hypothesis 1b. Regression coefficients for INVOLVE and JOBSAT were not significant. Hypotheses 2b and 3b were not supported.

Hierarchical regressions, with the same controls, were used to examine the effects of the two exploratory measures of employment relations quality, EVALAD and PROFDEV. Neither variable was significantly associated with TEST or RETAIN. Hypotheses 5a, 5b, 6a, and 6b were therefore not supported. To conserve space, these results are not presented.

Thus far, results in Table 3 showed that STRIKE, INVOLVE, JOBSAT, and TURNIN were employment relations measures that were associated with district productivity (albeit with varying strength). Of these measures, INVOLVE, JOBSAT, and TURNIN described employment relations quality as reflected by aggregate measures of the psychological states of teachers. That these measures were associated with district productivity was interesting, yet it left unanswered a practical question: How might school district administrators improve these teachers' psychological states? One possibility is that administrators could improve the adequacy of teacher performance evaluation and professional development programs.

**Table 4. Hierarchical Regression Results  
With INVOLVE, JOBSAT, and TURNIN as Dependent Variables**

|  | Beta | t       | R <sup>2</sup> | F       | ΔR <sup>2</sup> |
|--|------|---------|----------------|---------|-----------------|
| Dependent variable: INVOLVE            |      |         |                |         |                 |
| Step 1: Controls                       |      |         | .16            | 8.22**  |                 |
| SES                                    | .17  | 2.18*   |                |         |                 |
| INSTEXP                                | -.25 | -3.12** |                |         |                 |
| FACIL                                  | .20  | 3.50**  |                |         |                 |
| QUALIF                                 | .07  | 1.06    |                |         |                 |
| Step 2: Employment relations variables |      |         | .46            | 24.15** | .30**           |
| EVALAD                                 | .39  | 6.34**  |                |         |                 |
| PROFDEV                                | .31  | 5.10**  |                |         |                 |
| Dependent variable: JOBSAT             |      |         |                |         |                 |
| Step 1: Controls                       |      |         | .24            | 13.79** |                 |
| SES                                    | .04  | .41     |                |         |                 |
| INSTEXP                                | .06  | .64     |                |         |                 |
| FACIL                                  | .32  | 4.97**  |                |         |                 |
| QUALIF                                 | .20  | 3.00**  |                |         |                 |
| Step 2: Employment relations variables |      |         | .35            | 15.51** | .11**           |
| EVALAD                                 | .16  | 2.40**  |                |         |                 |
| PROFDEV                                | .26  | 3.89**  |                |         |                 |
| Dependent variable: TURNIN             |      |         |                |         |                 |
| Step 1: Controls                       |      |         | .07            | 3.52**  |                 |
| SES                                    | -.03 | -.31    |                |         |                 |
| INSTEXP                                | -.18 | -1.76*  |                |         |                 |
| FACIL                                  | -.11 | -1.49†  |                |         |                 |
| QUALIF                                 | -.04 | -.50    |                |         |                 |
| Step 2: Employment relations variables |      |         | .18            | 6.16**  | .11**           |
| EVALAD                                 | -.28 | -3.59** |                |         |                 |
| PROFDEV                                | -.10 | -1.27   |                |         |                 |

Note. Beta = standardized regression coefficient.

† $p < .10$ ; \* $p < .05$ ; \*\* $p < .01$ . Significance levels of regression coefficients are one-tailed.

To investigate this possibility, we conducted hierarchical regressions to test whether EVALAD and PROFDEV predicted INVOLVE, JOBSAT, or TURNIN. Table 4 presents the hierarchical regression using EVALAD and PROFDEV to predict INVOLVE. The introduction of EVALAD and PROFDEV in step 2 yielded a .30 increment in  $R^2$  beyond the controls. This increment was statistically significant,  $F(2, 173) = 48.06, p < .01$ . As individual predictors, both EVALAD and PROFDEV were significant at  $p < .01$ . Table 4 also presents the hierarchical regression using EVALAD and PROFDEV to predict JOBSAT. The introduction of EVALAD and PROFDEV in step 2 yielded a .11 increment in  $R^2$  beyond the controls,  $F(2, 173) = 14.64, p < .01$ . Both EVALAD and PROFDEV were significant at  $p < .01$ . Finally, Table 4 shows EVALAD and PROFDEV as predictors of TURNIN. Again, they provided a significant  $R^2$  increment of .11 beyond the controls,  $F(2, 173) = 11.60, p < .01$ . EVALAD showed the expected significant negative coefficient, although PROFDEV's negative coefficient failed to reach significance.

Results in Table 4 provide suggestive evidence that school administrators should focus on teacher performance evaluation and professional development programs as ways to increase teacher involvement and job satisfaction and to decrease teachers'

desire to look for employment elsewhere. These findings should be interpreted with caution, however, because the magnitudes of the significant regression coefficients for EVALAD and PROFDEV in Table 4 may have been inflated due to common method variance because all variables came from teacher self-reports. Although recent evidence has shown that common method variance can inflate, deflate, or leave unchanged the strength of a relationship between two variables (Crampton & Wagner, 1994), the present findings should be interpreted in light of Spector's (1987) adage that all self-report measures are correlated at .30.

### Discussion

The strengths of the present study included (a) theoretical development of the ER model based on the latest research literature on the effects of employment relations on organizational productivity; (b) the use of objective data on both cognitive and non-cognitive student outcomes to measure school district productivity; (c) the use of psychometrically sound survey measures of teacher perceptions, attitudes, and behavioral intentions; and (d) the use of important control variables in hypothesis tests of the ER model.

Regression results indicated that the ER model as a whole was associated with student academic competence and student retention, even after accounting for the control variables. In future tests of the model, however, a distinction may be warranted between school district productivity indicators that are strongly a function of intraschool factors versus productivity indicators that are relatively more influenced by forces outside the school. For example, the ER model showed a sizable association with student academic competency, a productivity indicator that closely reflected intraschool factors. Student retention, on the other hand, may be more susceptible to extra-school factors such as the economic needs of some families that require adolescents to quit school and get jobs. Perhaps for this reason, the ER model showed only a weak association with retention rate. The distinction between different types of school district productivity indicators is an issue that should be investigated in future research.

Findings showed that districts with histories of administrator-teacher conflict, as expressed in strikes, tended to have somewhat lower student retention. On the surface, this finding was inconsistent with Zirkel's (1992) study, which showed that negative effects of teacher strikes on student outcomes were only "partial and short-lived at most" (p. 134). However, in contrast to Zirkel, who examined whether a strike affected students during the same year or in a subsequent year or two after the strike, our study examined the degree to which a school district had a history of teacher strikes over an 8-year period. Our results indicate that a history of strikes may reflect a soured climate of relations between administrators and teachers, which makes teachers less enthusiastic about devoting the extra time and effort necessary to retain struggling students.

#### **TEACHER INVOLVEMENT, JOB SATISFACTION, AND TURNOVER INTENTIONS: WHY WERE THEY ASSOCIATED WITH SCHOOL DISTRICT PRODUCTIVITY?**

Aggregate measures of teacher involvement, job satisfaction, and turnover intentions were associated with school district productivity. Why were these teacher psychological

states associated with school district productivity? One possible explanation concerns the degree of teacher on-the-job discretion.

Three central features of the teaching task require teachers to exert substantial on-the-job discretion (cf. Bailey, 1992). First, task definition is variable. Because teachers experience little or no control over inputs, such as student abilities or conditions arising in the classroom, teachers must exhibit discretion, judgment, and flexibility (Kerchner & Mitchell, 1988) concerning how to best structure teaching methods to meet students' needs (Monk & King, 1994). Second, methods for problem resolution are uncertain. Although some general principles for analyzing teaching problems exist, it is often difficult for teachers to know *a priori* which teaching methods will yield optimal results (Brophy, 1986). Third, job performance is monitored indirectly. Teachers' preparation and skill, embodied in teacher certification, are designed to obligate them to monitor their own work in a way that is consistent with student learning (Shedd & Bacharach, 1991).

In organizations where job performance requires relatively little discretion, such as assembly line work, solutions to problems are more certain and job performance can be monitored directly. Here, old-fashioned management techniques based on external control of employees, tight authority relations, and low employee job security may be adequate. By contrast, because teaching requires substantial discretion, the use of old-fashioned management techniques to manage teachers will be suboptimal. Although teachers may give "a fair day's work for a fair day's pay," old-style management techniques will fail to exhaust potential teacher effort and initiative; there remains some effort that teachers exert at their own discretion (cf. Bailey, 1992).

When managing high-discretion employees such as teachers, policies emphasizing the development of effective employment relations such as involvement in decision making, high job satisfaction, and employment security are superior because they tap what Bailey (1992) calls "discretionary effort"—effort that teachers freely choose to give. Following Bailey's logic, discretionary effort results in exemplary teacher job performance such as better quality decision making, strong commitment to implementing decisions, heightened organizational loyalty, reduced absenteeism, and organizational citizenship behaviors (see also Cohen, 1993). Aggregated at the school district level, exemplary teacher behaviors yield increased school district productivity (cf. Organ, 1988).

#### LIMITATIONS

This study's results should be considered preliminary for several reasons. First, the data were cross-sectional. The usual criticisms of such data apply, such as the changing effects of variables over time. Second, although the Pennsylvania data used to test the model included sizable districts, such as those with more than 12,000 students, data were not available on the Philadelphia and Pittsburgh school districts. It should also be recognized, however, that the inclusion of Philadelphia and Pittsburgh could have confounded tests of the ER model because of the idiosyncratic nature of employment relations systems in these especially large districts. Third, although the present study used the school district as the unit of analysis, this was not the only possible unit of analysis for research on employment relations in educational organizations. We used

the school district as the unit of analysis because the policies, practices, and actions that govern employment relations are formulated and implemented at the school district level and because of the availability of district-level data. However, employment relations also may be affected by factors operating at the school level such as the principal-teacher relationship (Johnson, 1983). Fourth, the data did not exhaust all possible indicators of employment relations quality. Data were unavailable to measure other indicators such as grievances or teacher organizational commitment. A final limitation was that we hypothesized and tested only direct relationships between ER variables and school district performance. Future researchers may want to follow the work of Miller and Monge (1986) in exploring the complexities of relationships among involvement, job satisfaction, and productivity in the organizational context of schools.

#### MANAGERIAL AND PUBLIC POLICY IMPLICATIONS

Our study has managerial implications for school administrators because it suggests that public education may be improved by training school administrators to manage effectively the employment relations system within their school districts. But how do school administrators accomplish these improvements? One answer, suggested by the results in Table 4, is that teacher performance evaluation and professional development programs are managerial "levers" for administrators to use in improving teacher involvement, job satisfaction, and turnover intentions. Therefore, in conjunction with reform programs focusing on curricula and school funding, training administrators to manage employment relations more effectively could be a relatively inexpensive component of an overall scheme for reforming public education.

Finally, we argued earlier that the current public policy debate concerning how to reform public education should be guided by empirical research on the determinants of educational productivity. By investigating how educational productivity is affected by intraorganizational dynamics within public school districts, the present study demonstrated that the ER model can be a valuable tool for understanding determinants of educational productivity that have not been studied in previous research. Such an understanding is critical for developing policies for reforming public schools, which is necessary for improving the basic skill level of the American workforce.

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