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AUTHOR	Cook, Bryan G.; And Others
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ABSTRACT

This paper presents findings of research that examined the effects of two recent educational reforms--restructuring to produce effective schools and mainstreaming students with disabilities into general classes. Specifically, the relationship between general- and special-education achievement to school-environment quality indicators in 56 southern California schools was explored. Applying a theory of instructional tolerance that focuses on a microeconomic model of resource allocation, it was predicted that the school-level joint outcomes of general- and special-education achievement would diverge and relate differentially to indicators associated with greater school effectiveness. Data were obtained through a survey of 1,943 elementary teachers and 923 junior high teachers, an analysis of Basic Academic Skills Samples (BASS) test scores of special-education students, and an analysis of general-education students' California Assessment Program (CAP) scores. Results suggest that effective-schools research failed to produce unambiguous quality indicators nor descriptions of new technology. The data showed inverse relationships between changes in general- and special-education students' achievement in the sample schools, and inconsistent and differential relationships between school-environment quality indicators and the achievement change of the two groups of students. Additional resources and/or new instructional technologies are needed if general- and special-needs students are to be merged. Two figures and five tables are included. Contains 71 references. (LMI)

Are Recent Reforms Effective For All Students?

Bryan G. Cook, Melvyn I. Semmel, and Michael M. Gerber

Community and Organization Research Institute

Special Education Research Laboratory

University of California, Santa Barbara

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Requests for reprints should be sent to B. G. Cook, Center for the Advanced Studies of Individual Differences, c/o Community & Organization Research Institute (CORI), 2201 North Hall, University of California, Santa Barbara, 93106.

Abstract

This research examines the effects of two recent educational reforms--restructuring to produce effective schools and mainstreaming students with disabilities into general classes--by relating school level general and special education achievement with school environment "quality indicators" (e.g., academic emphasis) in 56 Southern California schools. Applying a theory of instructional tolerance that focuses on a microeconomic model of resource allocation, the authors predicted that the school level joint outcomes of general and special education achievement would diverge and relate differentially to indicators associated with greater school effectiveness. Results were interpreted to show inverse relationships between changes in general and special education students' achievement in sample schools, and inconsistent and differential relationships between school environment quality indicators and the achievement change of the two groups of students.

The Education for All Handicapped Act of 1975 (Public Law 94-142) acknowledged that quality of education depends at least partially on the milieu in which it takes place, and therefore asserted that students with disabilities be provided an individualized education in the least restrictive environment appropriate. Mainstreaming advocates (see Gartner & Lipsky, 1987; Lilly, 1988; Reynolds, Wang, & Walberg, 1987; Will, 1986) interpreted this to mean that the general class was the most appropriate placement for all individuals with mild disabilities. Although such sentiments have supported an increase in mainstreamed placements (Schnaiberg, 1994), the lack of empirical research justifying the general efficacy of mainstreaming created controversy regarding those practices (see Kauffman, 1989; Kauffman, Gerber, & Semmel, 1988; McKinney & Hocutt, 1988; Semmel, Abernathy, Butera & Lesar, 1991). A broader examination of the contemporary educational environment of schools, including consideration of policy trends and educational theory, will advance the debate regarding the appropriateness and efficacy of mainstreaming students with mild disabilities.

Recent reforms in general education aimed to reverse the nation's declining economy by seeking ways to produce higher academic achievement for all students despite constrained revenues (e.g., see National Commission on Excellence in Education, 1983). Faced with funding shortages (Alexander, 1992; Rasell & Mishel, 1990) and demands for academic excellence (Clark & Astuto, 1986), many schools implemented changes suggested by the effective schools research literature (see Hawley & Rosenholtz, 1984; Purkey & Smith, 1983; 1985). Some interpreters of effective schools research identified certain environmental characteristics, or quality indicators, of schools with high achievement means (e.g.,

academic emphasis) as replicable and prescriptive for an effective instructional climate. However, by concentrating solely on school achievement means, this body of influential research largely ignored student variance and the possibility that some students may respond differently to similar instructional variables (see Cuban, 1983; Long, 1985; Purkey & Smith, 1983).

The recommendations for reform in both the effective schools research literature and the national reports prefacing the reform movement disregarded the existence of students with special needs (Gartner & Lipsky, 1989; Gerber & Semmel, in press; Lilly, 1987; Purkey & Smith, 1985; Sapon-Shevin, 1987; Wang, Reynolds, & Walberg, 1988). The diverse educational traits and needs among the lowest achieving students ran counter to the emergent consensus that a uniform emphasis on core academics, high expectations, and rigorous standards would be universally effective (McDill, Natriello & Pallas, 1985). Observers became, "concerned over the tunnel vision that accompanies the single-minded quest for higher test scores" (Cuban, 1983, p. 696). Critics (Apple, 1988; Levin, 1987; Sapon-Shevin, 1987; Shepard, 1987; Tanner, 1989; Toch, 1984; Yudof, 1984) suggested that the drive for excellence would result in neglect and discrimination of students who lacked adequate resources to meet heightened demands. Effective schools research suggested potential ways to raise mean achievement inexpensively (Eubanks & Levine, 1983; Purkey & Smith, 1983). However, it was reported to be effective only for students who already performed above average; the lowest achievers were not successful in the new environments of academic press (Alexander & Pallas, 1984; Odden & Marsh, 1987).

Contemporaneously, the inclusion of students with disabilities in general classes found increasing support among both educational researchers and practitioners (Wang, Rubenstein & Reynolds, 1985). The lack of proven efficacy (Semmel, Gottlieb & Robinson, 1979) and legacy of racial prejudice (Dunn, 1968) in separate special services encouraged political movement to reform special education (e.g., Will, 1986). Increasingly, special education was viewed as too costly (see Chaikind, Danielson & Brauen, 1993) and unwarranted in that it represented, in the words of Gartner and Lipsky (1987), an "arbitrary decision ... that is both segregated and second class" (p. 368; see also Reynolds, et al., 1987). Kauffman (1989) summarized that the fundamental position of mainstreaming proponents was that schools can optimally serve the rights and potentials of students with mild disabilities by improving the education of all. All students deserved uniform treatment within the same pedagogical environment.

Yet general education teachers were not prepared to effectively instruct students with special needs (Kearney & Durand, 1992). Teachers felt that general classes inadequately addressed the needs of students with disabilities (Coates, 1989; Semmel, et al., 1991). Schumm and Vaughn (1991; 1992) found that general educators desired adaptations for students with disabilities, but viewed them infeasible. While 98% of general teachers rated their planning skills for general students as good or excellent, only 39% did for mainstreamed special education students. Zigmond and Baker (1990) attempted to improve typically unresponsive general class environments by implementing curriculum-based measurement and extensive staff in-services. In this and other case studies of supposedly exemplary full inclusion programs Zigmond and Baker (in press) found that instruction

continued to provide little individualization, failing to meet expectations that achievement would improve for students with learning disabilities.

Successive waves of inclusionary reform forged educational policy with image, fanaticism (Kauffman, 1993), and indiscriminate advocacy (MacMillan, Semmel & Gerber, 1994). The drive for policy changes and reallocation of special education resources (to those most likely to attain academic excellence; see Sapon-Shevin, 1987) obfuscated dissent based on historical experience (Kauffman & Pullen, 1989) and superseded a sufficient empirical determination of the effects of educating students with disabilities in contemporary general classes (McKinney & Hocutt, 1988).

Tolerance theory (Gerber & Semmel, 1985; Gerber, 1988) posits that teachers and schools cannot provide optimal learning conditions for each individual given limited instructional resources and students with varied instructional needs. Teachers can effectively reach students within a restricted span of variance through homogeneous instruction (Gerber & Semmel, 1984; 1985). However, students who fall outside this "tolerance" will be relatively underachieving under the same instructional conditions. Even in exemplary classrooms some students remain relatively less "tolerated". Instruction engages a range of some rather than other students because of their relative responsiveness to any given teacher's specific configuration of motivation and relevant knowledge, experience, and skills (Gerber, 1988; 1989).

School policies, implemented through principals, interact with teachers' allocation of instructional efforts to ultimately determine classroom tolerance. A microeconomic model of differential resource allocation is therefore useful for

predicting how finite instructional resources may necessarily produce trade-offs in achievement among subgroups of students (Brown & Saks, 1980; 1987; Gerber & Semmel, 1985). Students within an instructional tolerance can receive a relatively large proportion of the limited instructional resources embodied by the teacher's knowledge and skill, in which case they also receive increased learning opportunities. Conversely, students who are allocated less instructional effort will, in general, obtain sub-optimal learning opportunities. Semmel (1986) applied tolerance theory at the school level, implying that pervasive school climates dictate preferences for resource allocation in classrooms. Schools with student variance and limited resources can foster increased mean achievement (excellence) or decreased achievement variance (equity), but in the absence of a technological innovation which better utilizes given resources, they cannot simultaneously do both (Brown & Saks, 1980; Gerber & Semmel, 1985).

Recent demands for academic improvement within American schools pressed educators to value excellence. Principals (Gamoran, 1988) and teachers often preferred to allocate instructional resources to higher achieving students, as prescribed in the effective schools literature, because such allocation of effort resulted more readily in discernible increases in mean student achievement. Unless the environmental variables associated with the effective schools literature provided new instructional technologies that used existing resources more efficiently, such a shift in instructional emphasis may have excluded the lowest achieving students from tolerance, with the effect of decreasing their academic performance. Gersten, Walker, and Darch (1988) found that these "effective" practices, while perhaps

raising mean achievement, resulted in teachers being less tolerant of non-modal students.

The purpose of the present investigation was to determine the predictive efficacy of tolerance theory on the relative academic performance of students with mild disabilities at the school level, given the recent context mainstreaming and effective schools reforms. We predicted that changes in achievement for students in general and special education in the same schools would diverge over time, as schools have not typically received recent increases in resources or instructional technology and have experienced increasing variance, accelerated in the general classroom by inclusionary practices. We further predicted that schools seeking to be "effective" in terms of raising mean achievement would not be equally effective with their lowest achieving students (i.e., those with disabilities). Specifically, we proposed that indicators of effective school environments as denoted by extant research do not represent an advance in instructional technology. Rather, they signify a trivial adjustment of the allocation of resources within schools that effectively reduce the instructional tolerance for learners at the low end of the achievement distribution. Thus, we predicted that these quality indicators relate differentially to school level general versus special education achievement change.

Method

Participants

The School Environments Project (SEP) at UC Santa Barbara (Semmel & Gerber, co-directors) received permission to conduct teacher surveys in 215 elementary schools and 39 junior high schools, from a stratified random sample of

1,126 urban and suburban schools originally contacted in two Southern California counties.

Teachers. Surveys examining school environment were mailed to all teachers at the 254 schools that agreed to participate in the initial stage of SEP. Future analysis and participation in the study included only those elementary schools with survey return rates of 75% or greater (n = 107 schools, n = 1,943 teachers; mean return rate = 87.35%, *SD* = 8.72). All 39 schools (n = 923 teachers) in the junior high school sample were considered for future participation in the study, regardless of return rate (mean return rate = 50.63%, *SD* = 17.49). See Table 1 for a summary of reported characteristics of the preliminary teacher samples.

Insert Table 1 about here

Schools. Principals from the 107 elementary and 39 junior high schools participating in the initial teacher survey phase received invitations to participate in the second phase of the project, special education student testing. Thirty-three elementary schools and 24 junior high schools comprised the second phase sample of schools by agreeing to participate in special education student testing. See Table 2 for a description of sample schools.

Insert Table 2 about here

Special Education Students. We asked the 57 second phase sample schools to extend invitations to participate to their students with "learning handicaps". This

umbrella term used in California includes students with learning disabilities, communicative, emotional, or conduct disorders, or educable mental retardation. Students whose parents returned the authorization for testing comprised the school samples. In the 33 elementary schools, 279 students were tested in the 1990-91 school year, 186 in the 1991-92 year. In the junior high sample of 24 schools, 197 students were tested during the 1991-92 year, 183 students during 1992-93. Attrition was primarily due to graduation and student migration. The majority of sample students attended resource room/ pullout placements, many were in special day class placements, and a small number of students attended general classrooms on a full-time basis (see Tables 3 for a description of special education student samples). Teacher contract disputes (see Baker, 1992) limited student testing to 23 junior high schools in the second year of testing.

Insert Table 3 about here

General Education Students. The California Assessment Program (CAP), the state-wide testing system, made school level results publicly available for all sample schools. The CAP annually tested specific grade levels -- grades 3 and 6 in elementary schools, grade 8 in junior high schools -- to track school level academic progress. We chose to use grade 3 test scores to represent elementary school achievement as this grade level corresponded closely with our sample of students in special education. The CAP testing sample typically excluded students with disabilities (California State Department of Education, 1976; 1990). Participation

rates in grades tested approached 100% as CAP testing was mandatory for students in general education.

Instrumentation

The SEP research team employed three primary instruments to attain school level measurements of presence of effective quality indicators, general education student achievement change, and special education student achievement change.

Teacher Perception of School Environment Survey (TPSE). The TPSE assesses each school's implementation of quality indicators associated with high achieving schools in the effective schools research. The survey asks teachers to choose the most appropriate response to 44 substantive items relating to a broad range of components comprising school climate such as: cohesion, problem solving interactions, instructional monitoring and feedback, parental support, and academic emphasis and expectations. The TPSE is revised from an instrument previously developed, piloted and used in research (see Semmel & Larson, 1988). A number of items reflect content regarding prominent quality indicators (see Hawley & Rosenholtz, 1984; Purkey & Smith, 1983; 1985). Piloting of the instrument showed measures of each quality indicator to be internally reliable. The survey contains 30 items on a dichotomous scale and 14 on a four point scale.

Basic Academic Skills Samples (BASS). The BASS test is a standardized curriculum based measurement instrument that tests fluency in its reading section. Three cloze sample reading passages containing pre-primer to second grade vocabulary make up the reading portion of the test (see Espin, Deno, Maruyama, & Cohen, 1989). A key word is left blank approximately every sentence, requiring the student to circle the appropriate answer from three given choices. Blanks omit

words from various parts of speech (nouns, verbs, adjectives, prepositions) and all three choices for a given blank correspond to the matching part of speech.

California Assessment Program (CAP) School-wide Achievement Scores. Begun in 1972 and discontinued in 1992, the CAP allowed California to assess their own instructional goals, rather than rely on mass marketed material. The reading section consisted of multiple choice items assessing word identification (grade 3 only), vocabulary, comprehension, and study skills (Alexander, 1986). The California State Department of Education (1976; 1977) reported the tests as both reliable and valid. The CAP tests utilized matrix sampling, randomly giving students various sub-tests of a larger pool of tested items, and combining scores to generate school means.

Procedure

All teachers in potential sample schools were mailed TPSE surveys upon the principal's agreement to participate in this first phase of the study. Phone calls and repeat mailings to schools with low return rates followed initial mailings after one month's time.

Trained Field Associates administered the BASS test at each school to students with learning handicaps who received parental permission to participate in special education testing. Test instructions were scripted to secure uniformity. Testing of the three reading samples lasted exactly one-minute each. For a comprehensive summary of data collection and encoding procedures see Semmel and Gerber (1994). We obtained special education student reading scores by calculating the mean number of correct responses on the three tests. School scores were then calculated using the mean of student scores within a school. The school level mean

BASS score in the elementary sample was 3.51 (*SD* = 1.36) in the first year of testing (1990-91), and 3.98 (*SD* = 1.55) in 1991-92. In the junior high sample school BASS reading means were 5.95 (*SD* = 2.26) and 5.95 (*SD* = 2.02) in the academic years 1991-92 and 1992-93, respectively. The second year of junior high school testing (and hence school change measures as well) included only 23 schools. The differences between the two years of testing served as the measures of school level special education performance change.

Correspondence with the California Assessment Program (CAP) provided school level general education achievement data for third and eighth grade students in sample elementary and junior high schools, respectively. The state of California discontinued the CAP testing for the 1990-91 school year and renewed it in only secondary schools the following year, before discontinuing it entirely in 1992-93. School achievement change was therefore calculated from the academic years 1988-89 (mean reading score = 269.09; *SD* = 42.37) to 1989-90 (mean reading score = 272.03; *SD* = 42.62) for elementary schools, and 1989-90 (mean reading score = 232.50; *SD* = 47.64) to 1991-92 (mean reading score = 218.50; *SD* = 41.89) for junior high schools. These measures of general education achievement change were most proximal in time to our measures of special education students' performance.

Principal Components Analysis. After data entry and checking, two principal components analyses were employed to separately reduce the elementary and junior high school TPSE data sets. These analyses were conducted on surveys from schools with a return rate greater than 75% in the initial elementary sample (n = 107 schools; n = 1,943 teachers) and all surveys (n = 39 schools; n = 923 teachers) in

the initial junior high sample. Using eigen values greater than 1.0 as an extraction criterion and a varimax rotation to maximize orthogonality, both the elementary and junior high sample items reduced to similar structures consisting of 10 components or factors. An a priori decision was made to eliminate factors composed of only one item. In each sample four items with component loadings less than .50 were included in the factors, based on their conceptual and mathematical fit with the other items comprising the respective factor. The factor structures were consistent with models of effective school indicators as described in extant literature (e.g., Hawley & Rosenholtz, 1984; Purkey & Smith, 1983; 1985; also see Cook, 1994 for complete factor compositions and loadings). Tables 4 and 5 include the names of the elementary and junior high school factor structures, respectively. Factor scores were determined using unit weighting, or assigning equal weighting to each item composing a particular factor. Individual standardized scores from each item comprising a factor were added together, and that sum divided by the number of items in that factor. School means for each factor were then derived by averaging teachers' factor scores within each school, representing the degree to which teachers perceived their schools as possessing environmental indicators characteristic of effective schools.

Data Analysis

A chi-square test was used to determine if the frequency of sample schools in which general and special education achievement progressed in disparate directions differed from what would be expected by chance. Simple regression equations were used to examine the relation between school level general (as measured by the CAP) and special education (as measured by the BASS) achievement change, as

well as the relation between these outcomes and individual quality indicators (as measured by the TPSE). This procedure yielded an equation from which we estimated variance explained (r^2), and the slope (i.e., direction and magnitude) of change, in each group's achievement over time. We also conducted ANOVAs to determined the statistical significance of the variance explained by each simple regression equation. Differences between estimated slopes of general and special education achievement change in relation to individual quality indicators were compared using a one-tailed t-test, as we predicted that quality indicators would relate positively to CAP change and negatively to BASS change. Achievement change scores were standardized for this final analysis to meet the assumption of homogeneity of variance (see Shavelson, 1988, p. 578-581).

Results

The initial analysis compared general and special education achievement change at the school level, using separate simple regression equations and a chi-square test to analyze both samples. The subsequent analysis examined and compared the relationships of school level general and special education achievement change to individual school level quality indicators associated with effective schools research, by reporting the results of a series of simple regression equations and t-tests.

Comparison of General and Special Education Achievement Change

Figure 1 presents the simple regression equation relating school level general and special education achievement change in elementary schools that accounted for 18% of total variance, achieving statistical significance [$F(1, 32) = 6.78$, $p < .05$]. As predicted, within-school changes in general and special education achievement

related inversely in our sample of elementary schools. Although for schools in our junior high sample regression estimates were not statistically significant [$R^2 = .08$, $F(1, 22) = 1.99$, $p = .17$], the inverse relation of achievement change for the two groups of students was also as predicted (see Figure 2).

The majority of schools appeared in either the upper-left or lower-right quadrant of the Cartesian graphs representing the school level changes of joint outcomes, indicating that in most sample schools one group of students increased in achievement while the other group decreased. Results of a chi-square analysis indicated that the 21 of 33 elementary sample schools that experienced a divergence in outcomes of the two sub-groups of students was not significantly different than would be expected from chance [X^2 (1, $n = 33$) = 2.45, $p = .16$]. The frequency of sample junior high schools in which school level CAP and BASS performance progressed in different directions (17 of 23) was significantly different than would be expected from chance [X^2 (1, $n = 23$) = 5.26, $p < .01$].

Insert Figures 1 & 2 about here

Achievement Change in Relation to Quality Indicators

School level general education achievement change was regressed on each quality indicator, as displayed in the first columns of Tables 4 and 5. One of the quality indicators, Frequency of Professional Interaction, significantly predicted school level general education achievement change in the elementary sample, explaining 12% of total variance [$F(1, 32) = 4.32$, $p < .05$]. This quality indicator reflected a positive relation (slope) with general education achievement change.

However, it related inversely with school level special education achievement change, accounting for 3% of total variance in school level BASS performance change. In the junior high sample no quality indicator significantly predicted school level general education achievement change.

School level special education achievement change was also regressed on each quality indicator (see Tables 4 and 5, second columns). No quality indicator significantly predicted special education achievement change in the elementary sample. The quality indicator Academic Emphasis significantly predicted special education achievement change [$F(1, 22) = 13.90$, $p < .01$] in the sample of junior high schools. Measured Academic Emphasis accounted for 40% of the total variance in school level BASS change, relating inversely to special education performance change. The same quality indicator was not similarly predictive of general education achievement change, accounting for 4% of total variance and relating positively to school level CAP change.

Insert Table 4 about here

The prediction line slopes of four elementary quality indicators significantly differed when their relations to school level general and special education achievement change were compared. The quality indicators Principal's Valuation of Teaching Staff [$t(62) = 1.78$, $p < .05$], Administrative Feedback & Teacher Recognition [$t(62) = 1.99$, $p < .05$], Frequency of Professional Interaction [$t(62) = 3.50$, $p < .001$], and Instructional Resources [$t(62) = 1.68$, $p < .05$] each related positively with general achievement change, and negatively to special education

achievement change. The quality indicators Academic Emphasis [t (43) = 7.41, p < .001] and Recognition of Exemplary Teaching [t (43) = 2.66, p < .01] also showed statistically significant differences between the prediction function slopes relating to CAP and BASS change in the junior high school sample. Both quality indicators related to school level general achievement change positively, special education achievement change negatively.

Insert Table 5 about here

Discussion

Edmonds (1982) stated that implementation of frequently noted features of effective schools would enable schools to improve the achievement of all students. Will (1986) also implied that the coinciding effective schools research and mainstreaming reforms facilitated one another. However, results in the present study were consistent with our predictions based on tolerance theory that school level general and special education achievement progresses in opposite directions; and indicators of environmental quality, thought to be associated with effective schools, do not similarly relate to achievement for students in general and special education. These results support previous claims that effective schools research variables do not constitute a new instructional technology and therefore do not promote greater acceptance of variance (e.g., Kauffman, et al., 1988) or enable achievement gains for all students (see Gerber & Semmel, 1985).

Comparison of General and Special Education Achievement Change

The comparisons between general and special achievement change (see Figures 1 and 2) constituted evidence supporting the microeconomic theory of differential outcomes at the school level of analysis. The inverse relations of general and special education achievement change in both school samples replicated the theoretical joint outcome possibilities of two students with different abilities posited by Brown and Saks (1980) and Gerber and Semmel (1985). The comparisons of change in general and special education achievement further showed that the relative magnitude of change typically corresponded inversely with one another at the school level, lending further credence to the school level effects of microeconomic resource allocation predicted by tolerance theory.

A total of 38 of the 56 sample schools produced achievement gains in some students while simultaneously effecting a decrease in achievement outcomes of students with different learning traits. General and special education achievement progressed in similar directions in only 18 sample schools. Achievement gains or losses in these schools were typically of a small magnitude. Tolerance theory would posit that those schools that experienced achievement increases for both groups of students (11 schools) likely benefited from an atypical increase in resources or used present resources more efficiently. Similarly, those schools in which both groups of students decreased in achievement (7 schools) may have lost resources or used them less efficiently than in the previous year.

Achievement Change in Relation to Quality Indicators

Simple regression equations were used to investigate the effects of quality indicators on the achievement changes of general and special education students in

schools (see Tables 4 and 5). Many of the quality indicators associated with effective school climates did significantly and positively relate to general education achievement status (one year) in sample schools (see Cook, 1994), as reported in the effective schools literature. However, they did not predict general education achievement change as effectively or in a consistently positive relation, replicating the results of Brookover and Lezotte (1979). This was particularly evident in the junior high school sample, a realm of schooling infrequently addressed by effective schools research (see Cuban, 1983, Purkey & Smith, 1983). These findings suggest that variables espoused in effective schools research may not serve as constructive agents of change as well as they reflect the status quo of high achieving schools.

The only quality indicator that significantly predicted general education achievement change (Frequency of Professional Interaction in the elementary sample) was not significant at a more stringent alpha level ($p < .01$). This is noteworthy because a small series of simple regression analyses was carried out (10 in each sample), increasing the risk of Type I error. Nonetheless, it is meaningful that this quality indicator related positively to general education achievement change, but related insignificantly and inversely with special education achievement change.

The only significant predictor of special education achievement change in either sample was Academic Emphasis (in the junior high sample), which did exceed a more stringent alpha level ($p < .01$). Every standard deviation increase of teacher perceived Academic Emphasis corresponded with a 4.39 point *decrease* in BASS reading performance (bear in mind that mean BASS achievement at the junior high

school level was 5.95 in each year of testing). As the theoretically driven prediction suggested, when junior high sample teachers reported a school environment of high academic emphasis a proportion of the lowest achieving students markedly decreased in achievement, as the focus of instruction likely excluded them from tolerance (also see Biemiller, 1993). These results lend credence to findings that the most "effective" teachers were least tolerant of, or effective with, deviant children (see Gersten, et al., 1988).

Moreover, the null hypothesis that the observed difference between the two regression prediction functions (slopes) relating each quality indicator to CAP and BASS change resulted from chance was rejected for six quality indicators, including both quality indicators that related significantly to the achievement change of either group of students. Three quality indicators, Frequency of Professional Interaction in the elementary sample, and Recognition of Exemplary Teaching and Academic Emphasis in the junior high sample, differentially related to general and special education achievement change at a more stringent significance level ($p <$ .01). These results dispute the assumption that it is possible to improve the education of all students, including those with mild disabilities, by implementing variables associated with exceptional schools and high mean achievement. Many of these variables, including the only quality indicators we found to significantly relate to change in student achievement outcomes, fostered a significant divergence in the school level achievement of general and special education students in sample schools. As predicted, each of these quality indicators related positively to general education achievement change and negatively to special education change.

Implications of Instructional Theory and Recent Reforms

The application of a theory of tolerance based on the microeconomic allocation of instructional resources, and the recognition that schools, as well as classrooms, act as producers of joint outcomes, yield a disconcerting prediction about the likely effects of recent educational reforms. Teachers can effectively instruct an expanded proportion of students by increasing resources, or freeing existing resources through a new technology (Gerber, 1988). Many schools have attempted to improve the quality of their environments consistent with recommendations drawn from the effective schools research. Reformers expected that this effort would expand instructional tolerance and provide achievement gains for all learners, despite existent conditions of constrained resources (Monk, 1982) and rising student variance (Fuchs, Fuchs, & Bishop, 1992) accelerated in general classes by inclusionary policies (Semmel, Gerber, & MacMillan, 1994). The results of this study suggest that effective schools research did not yield unambiguous quality indicators nor descriptions of new technology. Therefore, implementation of features thought to enhance achievement for all may not inevitably produce higher levels of achievement for students with significant individual differences, and may in fact produce greater variance among school level achievement.

Educational reform will do well in the future to overcome the simplistic notion that significantly increased achievement for all can be attained without additional resources and/ or powerful new instructional technologies. Merging general and special students under present conditions will not accomplish the worthy goals of school reform (Lieberman, 1985). For many students with special needs, the contemporary general class may be a non-productive environment that

cannot safeguard scarce instructional resources. To best recognize and address the needs of all students, diversity will have to be truly celebrated (Kauffman, 1993), education that truly addresses the unique needs of students with disabilities expanded (Gerber, 1989; Semmel, 1986), and new constructive pedagogy derived to meet an unprecedented range of learning styles. Truly effective educational reforms must enhance the educational opportunities of all students.

Further research with an increased longitudinal span and a more comprehensive sample would be of great value in validating a tolerance theory of school instruction and its implications for school reform. Continuing research regarding instructional technologies is an essential component of providing each individual with an appropriate education, that may, or may not, take place in the general class.

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Table 1

Reported Characteristics of Teacher Perception of School Environment (TPSE) Survey Respondents

Measure	Elementary Teachers[a] n	(%)	Junior High Teachers[b] n	(%)
Gender				
Female	1702	(87.60)	595	(64.46)
Male	213	(10.96)	302	(32.72)
Unreported	28	(1.44)	26	(2.82)
Ethnic Group				
African American	69	(3.55)	49	(5.31)
Asian	113	(5.82)	36	(3.90)
Caucasian	1465	(75.40)	627	(67.93)
Spanish Speaking	150	(7.72)	53	(5.74)
Other / Unreported	146	(7.51)	158	(17.12)
Grade Level Taught				
Primary Elementary[c]	630	(32.42)		
Intermediate Elementary[d]	383	(19.71)		
Upper Elementary[e]	701	(36.08)		
Seventh			82	(8.88)
Eighth			109	(11.81)
Sixth, Seventh, and Eighth			193	(20.91)
Seventh and Eighth			232	(25.14)
Other / Unreported	229	(11.79)	307	(33.26)
Position				
Bilingual	280	(14.41)	57	(6.18)
General Education	1304	(67.11)	687	(74.43)
Special Education	171	(8.80)	93	(10.08)
Other / Unreported	188	(9.68)	86	(9.32)
Years of Teaching Experience	Mean = 16.78 (*SD* = 17.06)		Mean = 14.83 (*SD* = 9.23)	
Years of Experience at Site	Mean = 10.01 (*SD* = 17.17)		Mean = 7.18 (*SD* = 7.27)	

[a]n = 1,943 teachers. [b]n = 923 teachers. [c]Kindergarten - Grade 2.

[d]Grade 3 - Grade 4. [e]Grade 5 and above.

Table 2

Reported Characteristics of Sample Schools

Measure	Elementary Schools Year 1 Mean (*SD*) n = 33	Elementary Schools Year 2 Mean (*SD*) n = 33	Junior High Schools Year 1 Mean (*SD*) n = 24	Junior High Schools Year 2 Mean (*SD*) n = 23
Average Daily Attendance[a]	508.26 (191.01)	532.43 (217.35)	853.03 (374.94)	1091.81 (492.25)
Average Class Size[a]	29.75 (1.34)	29.43 (1.89)	31.46 (3.26)	33.22 (3.09)
Students with Mild Handicaps[a]	28.69 (16.92)	30.00 (15.38)	52.82 (25.70)	69.22 (34.54)
Statewide Reading Achievement Percentile Rank[b]	43.69 (27.76)	47.90 (28.39)	33.25 (25.33)	33.33 (25.29)
Statewide Socio-economic Status Percentile Rank[b]	49.69 (24.81)	53.06 (25.26)	36.08 (28.17)	36.50 (26.38)
Attendance of Students with Limited English Proficiency Statewide Percentile Rank[b]	63.00 (24.14)	61.39 (26.27)	76.16 (18.72)	76.29 (20.24)

[a]collected by the School Environment Project (SEP) in academic years 1990-91 and 1991-92 in elementary schools; 1991-92 and 1992-3 in junior high schools.

[b]obtained through correspondence with the California Assessment Program (CAP) representing the academic years 1988-89 and 1989-90 in elementary schools; 1989-90 and 1991-92 in junior high schools.

Table 3

Reported Characteristics of Sample Students with Mild Handicaps

Measure	Elementary Schools Year 1 Mean (*SD*) n = 279	Elementary Schools Year 2 Mean (*SD*) n = 186	Junior High Schools Year 1 Mean (*SD*) n = 197	Junior High Schools Year 2 Mean (*SD*) n = 183
Grade Level	3.45 (1.46)	4.06 (1.36)	7.09 (0.86)	7.25 (0.80)
Students per School	8.42 (4.67)	5.63 (3.27)	8.20 (3.79)	7.91 (5.19)
Classtype				
General[a]				
n =	16	14	26	25
% =	5.73	7.53	13.20	13.66
RSP[b]				
n =	192	127	97	82
% =	68.82	68.28	49.24	44.81
SDC[c]				
n =	41	34	72	75
% =	14.70	18.28	36.55	40.98
Unreported				
n =	30	11	2	1
% =	10.75	5.91	1.02	0.55

[a]students are enrolled in the general class on a full-time basis. [b]students are enrolled in a pull-out resource room program. [c]students are enrolled in a special day class.

Table 4

Simple Regressions Describing Relation of Elementary Quality Indicators to Student Achievement Change Outcomes

Quality Indicators	CAP Reading Change[a] r^2	CAP Reading Change[a] slope (std.value)	BASS Reading Change[a] r^2	BASS Reading Change[a] slope (std.value)
Principal's Valuation of Teaching Staff[b]	.02	10.65 (.14)	.01	-0.42 (-.11)
Administrative Feedback & Teacher Recognition[b]	.06	14.15 (.22)	<.01	-0.22 (-.08)
Parent Support of School Goals & Teacher Efforts	<.01	-1.36 (-.02)	.02	0.39 (.14)
Frequency of Professional Interaction[b]	.12*	23.02 (.35)	.03	-0.54 (-.17)
Monitoring of Academic Performance	.02	15.51 (.14)	<.01	0.33 (.06)
Instructional Resources[b]	.07	16.31 (.25)	<.01	-0.01 (-.00)
Academic Emphasis	.01	9.85 (.11)	.04	0.98 (.21)
School Cohesion	.02	10.00 (.15)	<.01	-0.00 (-.00)
Academic Expectations	<.01	-2.62 (-.04)	.02	0.39 (.12)
Responsibility for Discipline	.04	9.65 (.20)	<.01	-0.13 (-.05)

Note. CAP is an abbreviation of California Assessment Program. BASS is an abbreviation of Basic Academic Skills Sample.

[a]n = 33 schools. [b]denotes a significantly different slope between CAP and BASS change ($p < .05$).

* $p < .05$.

Table 5

Simple Regressions Describing Relation of Junior High Quality Indicators to Student Achievement Change Outcomes

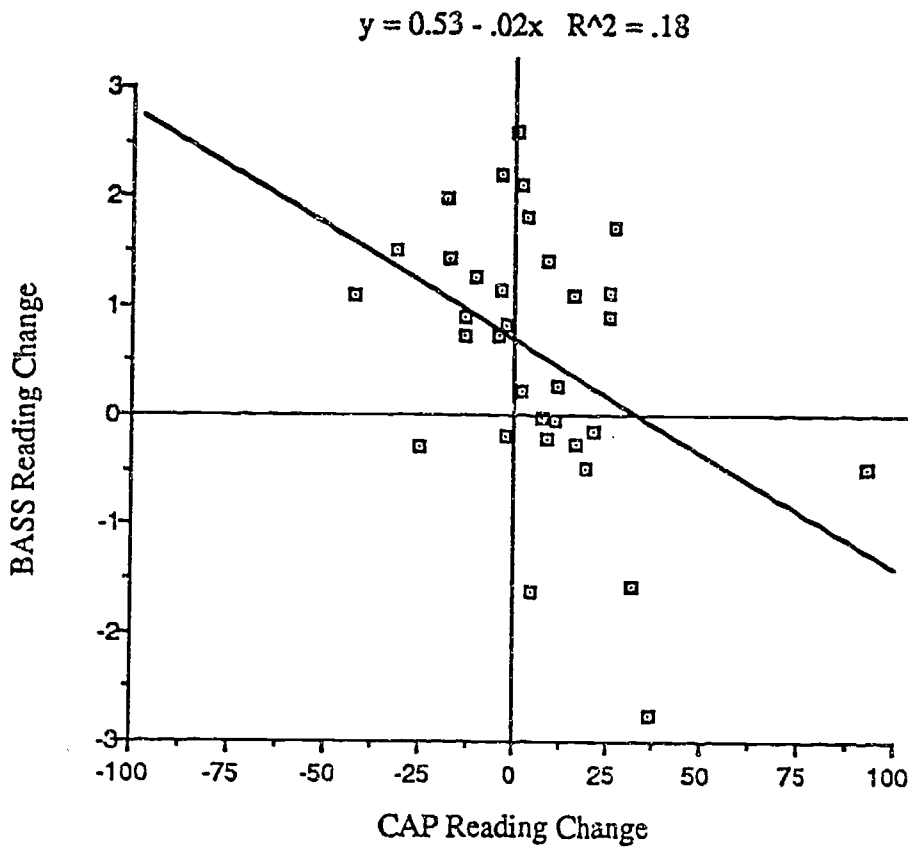
Quality Indicators	CAP Reading Change[a] r^2	CAP Reading Change[a] slope (std.value)	BASS Reading Change[a] r^2	BASS Reading Change[a] slope (std.value)
Principal's Valuation of Teaching Staff	.03	-9.41 (-.18)	<.01	0.05 (.01)
Parental Support of School Goals & Teacher Efforts	.03	-7.09 (-.17)	<.01	-0.06 (-.02)
Problem Solving & Professional Interaction	.05	-10.28 (-.19)	<.01	-0.18 (-.06)
School Cohesion	.07	-10.50 (-.26)	.01	-0.20 (-.07)
Instructional Resources	.01	-6.17 (-.11)	.01	-0.42 (-.10)
Academic Emphasis[c]	.04	19.38 (.20)	.40**	-4.39 (-.63)
Monitoring of Academic Performance	<.01	-1.39 (-.02)	.04	-1.25 (-.20)
Recognition of Exemplary Teaching[c]	.07	13.58 (.26)	.03	-0.71 (-.18)
Organizational Structure	<.01	-3.42 (-.06)	<.01	0.30 (.08)
Academic Expectations	.01	-4.65 (-.11)	<.01	-0.25 (-.08)

Note. CAP is an abbreviation of California Assessment Program. BASS is an abbreviation of Basic Academic Skills Sample.

[a]n = 24 schools. [b]n = 23 schools. [c]denotes significantly different slope between CAP and BASS change ($p < .05$).

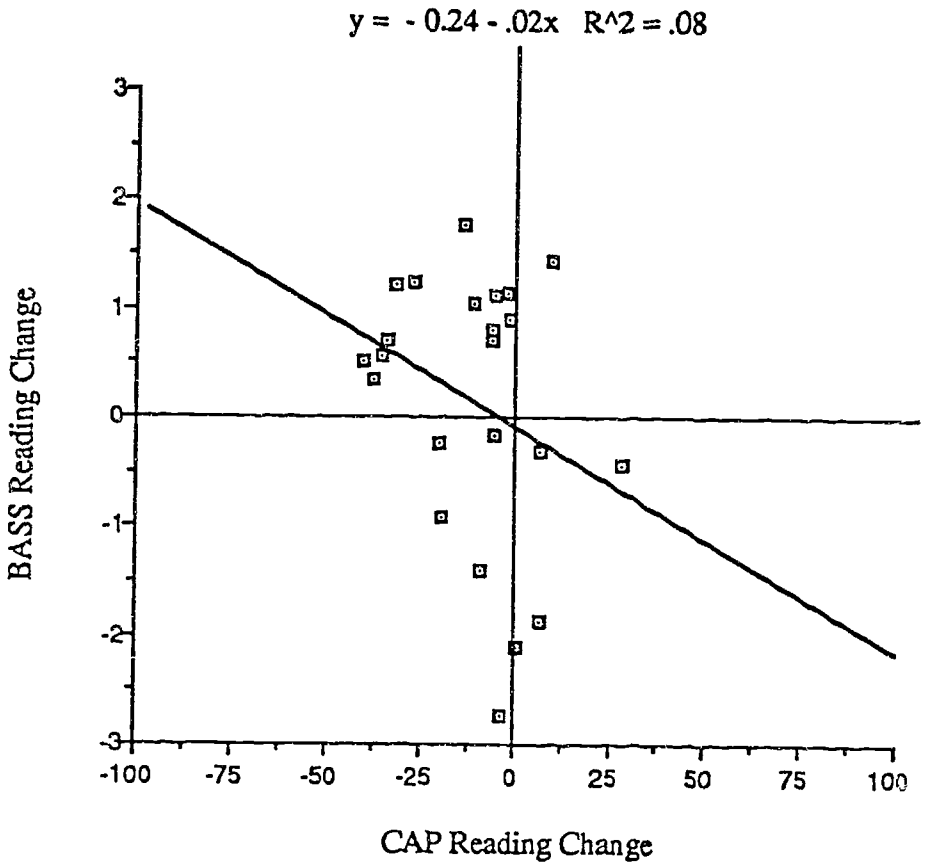
** $p < .01$.

Figure 1. Simple Regression of Elementary General (CAP) and Special (BASS) Education Reading Achievement Change.



Note. CAP is an abbreviation of California Assessment Program. BASS is an abbreviation of Basic Academic Skills Sample.

Figure 2. Simple Regression of Junior High General (CAP) and Special (BASS) Education Reading Achievement Change.



Note. CAP is an abbreviation of California Assessment Program. BASS is an abbreviation of Basic Academic Skills Sample.