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ABSTRACT

This paper revisited the findings of a study of school effectiveness changes by J. Gray and others (1995) and compared them to findings from two other studies, one by J. Freeman and C. Teddlie (1996) and the other conducted for this report. In the study by Gray and others, the researchers used data from three cohorts of secondary school students in Great Britain. The outcome measure was a national examination. Complete data were obtained for 7,829 students from 30 different schools. In the study by Freeman and Teddlie, the school effectiveness indicator was established by using a regression model using a composite student achievement score as a criterion variable and two predictor variables, student socioeconomic status and community type. Data were obtained for 634 students. In the current study, Scholastic Assessment Test scores from each school were used as indicators of school effectiveness. There were many differences among these studies, but some conclusions can be drawn from the results. The range of percentages for schools that change, as predicted by Gray and others, one-fifth to one-fourth, with roughly half improving and half declining, was similar to that found for the other two studies, strengthening the notion that in a given set of schools, it is predictable how many will be changing. Differences do suggest that the criteria and methods for establishing school effectiveness indicators will result in unlike results. All three studies suggest that less than 20% of schools will improve over time, and it would be rare that a school would move from the bottom quarter to the top over a 3-year period. All three studies also suggest that 20% of schools decline over time. A close look at the school effectiveness indicators suggests that, while the majority of schools remain stable in effectiveness levels over time, this is not a linear process but one that had fluctuations over time. The study also suggests that the schools in Alabama, although involved in a statewide accountability program, were not improving at a greater rate than schools in the other studies that were not involved in an accountability/improvement program. An appendix contains an excerpt from the Alabama Administrative Code. (Contains 63 references.) (SLD)

The Impact of Unlike Indicators on the Level of School Effectiveness Status over Time: Comparisons of Schools in Two States

By

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Introduction

For the past ten years or so, the research areas of school effectiveness and school improvement have been engaged in a slow, but deliberate process of merging their divergent philosophies and methodologies (e.g., Freeman, 1997; Gray, Jesson, Goldstein, Hedger, & Rasbash, 1995; Gray, Hopkins, Reynolds, Wilcox, Farrell, & Jesson, 1999; Reynolds, Hopkins, & Stoll, 1993). Stability, or how constant the measures of school effectiveness are across different points in time (Crone, Lang, Franklin, & Halbrook, 1994), is one aspect of school effectiveness research that is antithetical to school improvement research. In an attempt to explore school improvement from the perspective of school effectiveness, Gray et al. (1995) set about to answer the question, how much do schools change in terms of their effectiveness over a number of years? The results will be presented later in this paper; along with the results of two other recent studies to determine if change occurs consistently over time, or more appropriately, can we anticipate change?

In this effort to merge the disciplines of school effectiveness research and school improvement research, a major effort must be made to reconcile the issue of stability vs. change. Gray et al. (1995) had this in mind when they sought to determine the degree of change in effectiveness levels over time. They found that roughly two-thirds of the schools failed to change, while one-third changed (either improving or declining) in terms of effectiveness.

Purpose of the Study

The intent of this paper is to revisit the Gray et al. (1995) study, take the findings, and compare them to the results of school change in two other venues. One of the

suggestions from the original study was that this degree of change over time might be impacted by the method of measuring the levels of effectiveness. In order to examine this idea, the two other studies in this paper will be presented, despite the fact that both of these studies differ in terms of sample size, school configuration, and methodology. Regardless of these differences, the present study will partially replicate the Gray et al. (1995) study to determine the degree of change in effectiveness levels over time using these differences as a type of independent variable, although we are not seeking to obtain any statistical significance, or hypothesis-testing results. It is simply the purpose of this study to compare these results for differences in degree of change in effectiveness over time, as measured by two different indicators of effectiveness.

Significance of the Study

It is the intent of the present study to partially replicate the Gray et al. (1995) study seeking to measure the degree of change in effectiveness levels over time, using divergent designs. By doing this, we hope to build upon the previous study and begin to answer some of the questions raised by the researchers in that study. Therefore, it is our belief that the significance of the present study lies in the fact that it is another step toward the merger of school effectiveness and school improvement research disciplines. By measuring school improvement in terms of school effectiveness indicators, we hope to help alleviate the contradiction concerning stability vs. change in the field.

Background Literature

Beginning in the 1950s, and increasingly in the 1960s, federal funding of public education increased dramatically. With this increase in federal support, policymakers increased the emphasis on evaluating the product of education. The first major effort by

the federal government to evaluate public education came in the Coleman Report (Coleman, Campbell, Hobson, McPartland, Mood, Weinfeld, & York, 1966), the results of which were interpreted erroneously, suggested that public schools did not affect the educational success of students. Jencks and his colleagues (1972) followed these findings and added to the controversy by reporting that schools do not have as much impact on students' cognitive achievement as family characteristics and social class. These findings were interpreted to mean that school reform in curriculum, instruction, and financial expenditures would not favorably affect the achievement of students as measured by objective tests (Jencks et al. 1972).

The Coleman and Jencks Reports were troubling to educational policymakers who had a personal stake in governmental funding of public education. They feared that Congress might react to these findings by asking, "why spend billions of dollars on public education if schools do not make a measurable difference in the academic performance of its students?" In responding to the Coleman and Jencks Reports, a cadre of researchers harshly criticized their research methods. By correcting these methodological problems, they hoped to prove that schools could make a difference in a student's academic performance (e.g., Edmonds, 1979; Reynolds, 1976; Weber, 1971). Four major studies were conducted in the United States and Great Britain that disputed the findings of Coleman and Jencks (and a similar report in Great Britain, known as the Plowden Report), by concluding that certain school effects did have a measurable impact on student achievement (Brookover, Beady, Flood, Schweitzer, & Wisenbaker, 1979; Mortimore, Sammons, Stoll, Lewis, & Ecob, 1988; Rutter, Maughn, Mortimore, & Ousten, with Smith, 1979; Teddlie, Falkowski, Stringfield, Desselle, & Garvue, 1984).

These "responsive" studies laid the foundation in the late 1970s and early 1980s for what became known as school effectiveness research.

School Effectiveness Research

The emphasis of early school effectiveness research was to identify the characteristics of an effective school. Edmonds (1979) summarized these characteristics as: (a) strong educational leadership; (b) high expectations for student achievement; (c) an emphasis on basic skills; (d) a safe and orderly climate; and (e) frequent evaluations of pupils' progress. This emphasis on listing effective school characteristics caused the simultaneous development of school improvement research. Early school improvement research sought to use the characteristics of effective schools, such as the Five-Factor Model of Edmonds, by transplanting them to ineffective schools. The results were mixed due in some cases to a lack of consideration of what Elmore (1978) and McLaughlin (1978) called "mutual adaptation." Mutual adaptation occurs when the interaction between a given environment and a plan to produce change in that environment results in a program outcome that differs from the one originally intended (Purkey & Smith, 1983).

Since most of the early school effectiveness research was carried out in low-SES, inner-city schools, Edmonds called for the creation of 'effective schools for the urban poor' in those specific environments (Edmonds, 1979). It was at this point that school improvement studies (e.g., Clark & McCarthy, 1983; McCormack-Larkin, 1985; McCormack-Larkin & Kritek, 1982; Taylor, 1990) began to flourish and surpass school effectiveness research in the U.S. However, the equity orientation in school effectiveness research, with its emphasis on school improvement and its obvious sampling biases led to criticism from the traditional educational scientific community (e.g., Cuban, 1983, 1984;

Firestone & Herriott, 1982; Good & Brophy, 1986; Purkey & Smith, 1983; Rowan, 1984; Rowan, Bossert, & Dwyer, 1983). This criticism resulted in a figurative wedge being driven between the school effectiveness and school improvement areas of research in the U.S. (Teddlie, 1994).

By the late 1980s a shift toward an "efficiency model" of school effectiveness began to develop centering on the issue of context (Wimpelberg, Teddlie, & Stringfield, 1989). With the emergence of the efficiency model, school effects began to be examined across a variety of context variables, such as the socioeconomic status (SES) of the students attending schools, grade levels of schools, and urbanicity of schools (Teddlie, 1994). Other context differences studied include the following: size of school and district, school governance sector (public/private), subject matter context, and administrative context (voluntary/ nonvoluntary orientation toward change) (Levine & Lezotte, 1990; Wimpelberg et al. 1989).

School effectiveness research within the efficiency model has shown that schools are social systems and are bound together by a complex array of contextual variables (Teddlie & Stringfield, 1993). What works in one school may not work in another school and unless school improvement or reform efforts allow for this fact, attempts at transplanting standardized school improvement plans have very little chance of success. Despite these findings concerning contextual factors in schools, government officials at the state and national levels began to insist that the characteristics of effective schools be incorporated into school improvement programs. By 1989, the U.S. General Accounting Office (GAO) issued a report that showed that more than 50% of American schools had undertaken school improvement efforts (GAO, 1989), which were primarily based on the

Five-Factor Model (Edmonds, 1979). This is a direct result of the Hawkins-Stafford Elementary and Secondary School Improvement Amendments of 1988 (Public Law 100-297), which specifically mandated that the characteristics identified in the Five-Factor Model must be stressed in any improvement programs funded with Chapter 1 and 2 monies (Teddlie & Stringfield, 1993).

With a general public perception that schools are not adequately preparing students for life, educational reform has developed into a major "industry," with new ideas arising from many areas. Restructuring, site-based management, outcomes-based education, magnet schools, redesign, total quality management, charter schools, vouchers, etc., have all been touted as the reform that will improve education in America. In Education Week, a national newspaper dedicated to educational issues, a series of articles detailed efforts to reform education. Included in that issue was a compilation of 36 organizations, foundations, and companies that promote, and often sell, school improvement (School reform networks at a glance, Nov. 2, 1994, pp. 34-41).

School Improvement Research

Reynolds and his colleagues (1993) found that most of the commonalties between school effectiveness and school improvement research are found in practice and not theory. While over half of U.S. schools have introduced some form of school improvement based on some aspect of school effectiveness research (General Accounting Office, 1989; Taylor, 1990), most schools base their practices on the "five factor" models of Edmonds (1979) and Lezotte (1989), rather than the studies of Teddlie and Stringfield (1993) and Mortimore et al. (1988), which have demonstrated that a one-size-fits-all

approach to school improvement will usually not be successful because each school has different needs in different contexts.

Thousands of school improvement programs have been aimed at improving the schools, the teachers, and the students, and have been attempted by the federal, state, and local governments as well as private interests in the U.S. With so many agencies attempting so many approaches to school improvement, it is easy to understand why a complete survey of the literature would be so difficult. To expedite this venture, an outline by Sashkin and Egermeier (1992) will be utilized to identify three broad perspectives on school improvement in the U.S. They based their work on research of Chin and Benne (1969) and House (1981). The following describes the three perspectives.

The rational-scientific perspective dominated attempts to improve schools from the 1950s to the 1970s. This perspective assumed that if people were given the necessary information to improve schools, that they would use that information.

The political perspective was best described by "strong external policy controls derived through processes of bargaining and political compromise among power groups," and was found in many autocratic, state level reform initiatives of the early 1980s (Sashkin & Egermeier, 1992, p. 2). Four instruments used by states to effect change were mandates, inducements, capacity building, and system changing (McDonnell & Elmore, 1987).

A change in meanings and values within the organization that is undergoing change describes the cultural perspective. These cultural changes result in a

"transformation" of the organization and are necessary because the status quo is preventing the school from improving (Moorman & Egermeier, 1992).

Sashkin and Egermeier (1992) posit that four operational strategies are used to implement one or more of these perspectives. These strategies are fix the parts, fix the people, fix the school, or fix the system.

Fix the parts implies that some part of the educational process is defective and can be identified and replaced with an innovation that will produce better results. This strategy is primarily based on the rational-scientific perspective. Many projects have been undertaken, particularly those that are federally funded, to study the processes by which school personnel receive information pertaining to new programs and how they adopt programs and practices that effect improvement.

Many studies reflected positively on those attempts to improve, while many studies showed that those efforts to improve made little or no difference, and that often innovations were adapted or changed, or improvements disappeared when the money ran out (McLaughlin, 1990). In summary, the "fix the parts" strategy has proven that even if an innovation is successfully transferred into schools, improvement may not be the result (Sashkin & Egermeier, 1992).

Fix the people is a strategy that is based on the idea that knowledge and skill improvement of teachers and administrators will allow them to better perform their roles and consequently better effect improvement in the schools (Sashkin & Egermeier, 1992). This strategy incorporates the rational-scientific perspective, but also incorporates the cultural perspective.

While most of the research in this area centered on developing the staff, rather than determining whether the school improved as a result of the "developed" staff (Freeman, 1997), other researchers took different approaches to the analysis of staff development. Fullan (1990) sought to link staff development to institutional development and identified several approaches to staff development. Levine and Lezotte (1990) concluded that practice-oriented staff development was more effective than "one shot" inservice training programs. And, Stedman (1987) found several common elements in staff development at unusually effective schools.

The fix the school strategy centered on developing the ability of the organizations' capacities to solve their problems. This concept arose from the field of practice known as "organizational development," or OD. With OD efforts are aimed at assisting members of organizations recognize problems confronting the whole organization rather than dealing with problems that affect parts of the organization (Sashkin & Egermeier, 1992).

Fullan, Miles, and Taylor (1981) reviewed OD practices in schools and recommended that this approach should only be used when a school or district meets certain "readiness criteria." A variety of OD-based school improvement models have been implemented since that review, some of which have been successful (Freeman, 1997).

The last strategy, fix the system, focuses on restructuring or comprehensive school change. Comprehensive restructuring encompasses the first three strategies and includes the community, the school district, state education agencies, professional development institutions, and also federal agencies (Sashkin & Egermeier, 1992). The

term restructuring might be a poor choice to describe this strategy because the word means so many different things to different people. However, research doesn't give a clear indication of the effectiveness of this approach (McDonnell, 1990).

There are at least two components that seem to appear in the restructuring literature. First, restructuring means that a coherent system exists to push authority down to the lowest level (Bailey, 1992). Second, restructuring involves a basic change in accountability, and this in turn relates to a set of changes in the "governance" of schools (Murphy, 1990).

Merging the Two Disciplines

The reviews of the school effectiveness research literature and the school improvement research literature indicate that the two fields have developed from different places both methodologically and theoretically (Gray, Reynolds, Fitz-Gibbon, & Jesson, 1996). Table 1 provides a generalization of the contrasts between school effectiveness and school improvement, as proposed by Reynolds et al. (1993).

Despite the differences between the two fields, recently researchers from both disciplines have called for a synthesis of school effectiveness and school improvement research. For example, Mortimore (1991) called for transferring the "energy, knowledge, and skills of school effectiveness research to the study of school improvement" (p. 223). Stoll and Fink (1992) stated, "it is only when school effectiveness research is merged with what is known about school improvement, planned change, and staff development, that schools and teachers can be empowered and supported in their growth toward effectiveness" (p. 104). In addition, Murphy (1992) has called for change that will realize the potential of conventional school improvement and also the more radical

Table 1
The Separate Traditions of School Effectiveness and School Improvement (Reynolds et al., 1993, p. 44)

SCHOOL EFFECTIVENESS	SCHOOL IMPROVEMENT IN THE 1980s
Focus on schools	Focus on individual teachers or groups of teachers
Focus on school organization	Focus on school processes
Data driven, with emphasis on outcomes	Rare empirical evaluation of effects of changes
Quantitative in orientation	Qualitative in orientation
Lack of knowledge about how to implement change strategies	Concerned with change in schools exclusively
More concerned with change in pupil outcomes	More concerned with the journey of school improvement than its destination
More concerned with schools at a point in time	More concern with schools as changing
Based on research knowledge	Focus on practitioner knowledge

restructuring of the entire educational system, including its power relations, and the teaching-learning processes in schools. Furthermore, the international journal, School Effectiveness and School Improvement, in its mission statement argued for "empirical rationality" in assessing the validity of models in both school effectiveness and school improvement (Creemers & Reynolds, 1990).

With this increased emphasis on attempting to combine school effectiveness and school improvement research, Reynolds et al. (1993) have developed a series of suggestions that would facilitate this merger.

1. Develop more case studies in school effectiveness research so that the transfer of knowledge to the school improvement community (with its emphasis on qualitative data) will be more relevant.
2. School effectiveness research should put more emphasis on process factors such as attitudes, values, relationships, and climate, which are needed by school improvement research.
3. School effectiveness research tends to take "snapshots" of schools rather than taking moving pictures of schools over time. School improvement research needs to know how schools became effective or ineffective to know how to replicate the process.
4. More emphasis should be placed on studying the variable of principal leadership outside the U.S.
5. Most school effectiveness research neglected the potential impact of other layers above the school level. There is evidence in school improvement research that these other layers may be crucial to generating improvement.
6. School effectiveness research should attempt to isolate direction and strength of the influences that link school process variables together.
7. School effectiveness research should attempt to determine which process variables are causes of school effectiveness. For example, does high

teacher expectation cause improved student performance or does high student performance cause higher teacher expectations.

8. Dated school effectiveness research from the 1980s may not be sufficient to address school improvement schemes of the 1990s. Therefore, it is important to make sure that the factors that identified effectiveness in the past are still relevant today.
9. Context research in school effectiveness has only been utilized a short time. At the present stage, the results are not specific enough to assist school improvement research in determining what will work indifferent schools.
10. The knowledge required of improvers of ineffective schools is not found in school effectiveness research. Assuming that what works in an effective school will work in an ineffective school is not sufficient.
11. School improvement research needs to address the impact of innovations upon student performance or outcomes. Without these data understanding the causal relationships between school processes and outcomes is impossible.
12. School improvement strategies need to move away from whole-school programs, bases on evidence from school effectiveness research that indicates that schools can have differential effects on students (Nuttall, Goldstein, Prosser, & Rasbash, 1989). School improvement programs should vary within the school in terms of their content, their focus, and their targeted population.

13. School improvement researchers need to concentrate on why changes occurred more than on how much change occurred.
14. School improvement researchers need to address the class level and the school level. Many school improvement programs disregard the nature of instructional practices altogether.

With this list of criteria for merging the two disciplines firmly planted in the literature today, various researchers have begun the task of meeting these criteria. Gray et al. (1995) has made one such attempt, where they sought to explore an aspect of school improvement from the perspective of school effectiveness. They attempted to answer the question, how much do schools change in terms of their effectiveness over a number of years? The answer to this question can facilitate a better framework for studying the mechanisms or processes of school improvement.

The reason that there are so few of these studies is the contrary positions that the two disciplines have regarding stability of effectiveness indicators. School effectiveness research has sought to strengthen their findings by initiating multiple years of data collection for the purpose of replication. If a lack of stability in those indicators is detected, the validity of the school effectiveness study is threatened. On the other hand, instability is necessary for school improvement research to take place. Improvement can only occur where change is present. The only way to approach this situation, then, is to develop an orientation toward change.

Since much of the early school effectiveness research indicates a high level of stability over time, the degree of change was not readily apparent. So, Gray et al. (1995) set about to determine how much schools change over time in regard to their school

effectiveness indicators. In that study, Gray and his colleagues (1995) found that when looking at a school's level of effectiveness in Year 1, and then again in Year 3 (see the methodology section for a detailed description of the methods employed in this study) around 68% of the schools were similarly categorized (see Table 2). In other words, in roughly two of three schools, there was no change in effectiveness levels over the three-year period. Likewise, roughly one third of the schools experienced a measurable change in effectiveness levels, that is, they either improved over time, or they declined in their level of effectiveness. The results indicate that roughly half (18% of the schools) of the changers improved and half (15% of the schools) declined in their effectiveness level.

Of course, Gray et al. (1995) were aware that the framework for reporting these changes in effectiveness levels was what they called "rule-of-thumb." However, when taking a more detailed look at individual schools in the study, only one of the 30 schools had improved consistently over the three-year period. Since only three years of data were used in the study, the results indicate that these were linear trends. The researchers cautioned against assuming non-linearity from just three years, but by the same token, non-linearity could not be ruled out.

Other findings from the Gray et al. (1995) study related to the issues of change in effectiveness levels over time are as follows:

1. Based on the evidence presented in the study, there appears to be only a small portion of schools in any area that will change (improving or declining) significantly. They noted that this number should be between one-fifth and one-fourth of the schools (which the present paper seeks to replicate, using other methods for measuring effectiveness levels). How much of this change

can be attributed to actual improvement in the school and how much is attributable to changes in pupil population (higher achieving students), is not answered by this study, but is a question that should be answered in further studies.

2. Changes in effectiveness levels are likely to appear modest, so researchers need to be aware of the sizes of changes that occur, and the potential significance in educational terms. For instance, consistent improvement over five years could turn an ineffective school into a relatively effective one.
3. With only three years' data the researchers refrained from speaking of trends. Each additional year's results will bring this to light more clearly. Also, the data were presented as a linear process, when in fact other studies (Gray et al., 1999) have indicated that change may be inconsistent over time. Fast improvement in the first years of an improvement project may slow down in later years, or reverse itself. It is important to understand that each school has its own unique "natural history" of change.
4. The extent to which changes in effectiveness are dependent on the outcome measures used needs to be examined. (This paper seeks to address this point by noting the levels of change in two other venues that use differing measures for effectiveness levels.) The fear is that aggregate measures may mask significant improvement in a particular subject area of the school, while showing the school, overall declined in effectiveness. The researchers also remind us that improvements in exam scores may not go hand-in-hand with

other kinds of change (see the discussion in this paper about high-stakes testing, as detailed by the American Educational Research Association).

5. The last thing detailed by Gray et al. (1995) was that we need to begin investigating the causes of change in particular schools, relative to other schools' levels of effectiveness. The correlates of improvement (changes in effectiveness) must be employed, rather than the correlates of effectiveness that dominate the school effectiveness literature. They referred back to the classic work of Purkey and Smith (1983) that asked such questions as "Were different strategies needed for low-achieving schools to raise their level of effectiveness, and for high-achieving schools that were beginning to decline in effectiveness?" And "what is needed to maintain a school's success once it is deemed to be academically effective?" In school improvement research, sites that are deemed to be ineffective are just as interesting as sites of highly effective schools.

Methodology

The methodology used to provide a comparison of school effectiveness levels required the establishment of an acceptable school effectiveness indicator in each study. Although school effectiveness research has developed an extensive literature base over the past 25 years, the main problem for researchers has remained the lack of a universally accepted method of classifying schools based on the criterion of effectiveness (Good & Brophy, 1986; Levine & Lezotte, 1990; Purkey & Smith, 1983; Rowan et al., 1983). The most widely utilized technique, the regression model resulting in school effectiveness indicators (SEI) is based on residual scores, has shown problems in terms of stability of

effectiveness measures over time (Mandeville & Anderson, 1987; Purkey & Smith, 1983; Rowan et al., 1983). However, for more than 20 years, since Dyer, Linn, and Patton (1969) attempted to control for student context and demographic variables, the regression model has been the most frequently used technique for establishing SEIs (Lang, 1991; Mandeville & Heidari, 1988).

In the U.K., these regression-based SEIs are known as "value-added" scores (Fitz-Gibbon, 1996). While some advocate the use of more advanced multilevel models for the generation of SEIs, such as utilized by Gray et al. (1995), research shows that multilevel models (focusing on the school level) and regression models (with the school as the unit of analysis) yield similar statistics (Kennedy, Teddlie, & Stringfield, 1993; Fitz-Gibbon, 1996).

Of some concern in the present study is the issue of consistency of school effectiveness indicators. When the model used as a school effectiveness indicator changes, often the classification of the school changes as well. For example, if the student achievement measurement used as the criterion variable in a regression model is based on reading scores, the school effectiveness classification may be different from the classification based on mathematics scores (Witte & Walsh, 1990). Therefore, Purkey and Smith (1983) felt that using only one subject area or grade level as the measure of student achievement gave a very limited view of a school's effectiveness. Mandeville and Anderson (1987) reported finding no "appreciably higher" consistency of scores with a combined reading-mathematics score, but stated that a composite should provide increased reliability. Crone, Lang, Teddlie, & Franklin, (1995), using a combined language arts/mathematics score as the criterion variable in the regression model, found

agreement between quantitative and qualitative results, further supporting the idea that a combination score provided for higher reliability in measuring effectiveness.

The main thrust of this study was to replicate a procedure conducted by Gray and his colleagues (1995) and Freeman and Teddlie (1996) to study changes in schools' effectiveness over time. They grouped schools' residuals into the top quarter, middle half, and bottom quarter (see Table 2). Regarding the charts, Gray et al. (1995) put their information "in a form that can be readily grasped by the non-statistical reader" (p. 108). That statement seemed very applicable for this study also.

The methodologies employed by the three studies used for comparison in this paper will be presented first, followed by a more specific description of how the comparisons are made.

Gray et al. (1995)

In this study, the researchers used data from three cohorts of secondary students in Great Britain. The student outcome measure was based on a national exam (GCSE) taken by all students aged 16 and above in a variety of different subjects. The students attended 30 different schools of varying organizational and governance types. Complete data were obtained on 7829 pupils, including test scores, prior attainment, pupils' gender, and school contextual data. A series of multi-level analyses utilizing a linear model that included the listed variables was developed. This analysis provided estimates of school-level residuals over the three-year period. These residuals were grouped into the top quarter, the middle half, and the bottom half for Years 1 and 3. The result is presented in Table 2.

Freeman and Teddlie (1996)

In this study, the school effectiveness indicator was established by using a regression model using a composite student achievement score (SIP Scores), as the criterion variable, and two predictor variables (Student SES and community type). The result of the regression model was a set of actual and predicted scores for each school. The difference between these two scores, the residual, was assigned and used to compare schools. The schools examined in this study numbered 634. Similarly to the Gray et al. (1995), the schools, based on their school effectiveness level were grouped into top quarter, middle half, and bottom quarter in Years 1 and 3. The results are presented in Table 2.

Present Study

Alabama does not have a composite score across grade level and subject area, so SAT average scores were used from each school as effectiveness indicators for this study. The state also uses these scores to evaluate each school and classifies each school as being academic clear, academic caution, or academic alert, based on a score derived from the SATs. The definition of each of these terms and how they are determined are included later in the paper.

The average SAT scores for all elementary schools, as reported by the Alabama State Department of Education at their web site, were tabulated and examined to determine which schools had improved, remained stable, or had declined from Year 1 to Year 3. Additionally, average SAT scores were used for comparison because there seems to be some agreement among researchers that increased reliability of a school's

effectiveness will result from using multiple scores (Purkey & Smith, 1983; Mandeville & Anderson, 1987).

All elementary schools that had an SAT score for 1997 and 1999 were imported into SPSS and divided into top quarter, middle half, and bottom quarter, for both years, in a similar way that the other two studies had done. Scores from 593 elementary schools were used in this study.

A matrix was constructed similar to Gray et al. (1995) and Freeman and Teddlie (1996) and was used to list each school's ranking for Year 1 and its ranking for Year 3 (see Table 2). Cells 2, 3, and 6 identified those schools that improved, while cells 4, 7, and 8 identified those schools that declined in their scores. Cells 1, 5, and 9 identified those schools that were stable. Schools that had scores in the middle half in Year 1 and again in Year 3 were considered stable even though their average SAT scores might have increased or decreased.

Since Alabama is in the midst of an educational reform effort to force schools to improve or face various negative sanctions, it seemed to be an opportune time to examine the specific indicators of effectiveness that are being used by the Alabama State Department of Education. By using a similar analysis process to that of Gray et al. (1995), and Freeman and Teddlie (1996), we can determine the degree of change in Alabama schools. This will give the percentage of schools that are improving, declining, and remaining stable based on the SAT average scores.

Since this study examines change that is assessed by "high-stakes" testing, it is appropriate to consider some of the problems associated with this type of assessment and

the accountability policies that result. The Alabama accountability program, with its definitions and policies, is included in Appendix A.

Accountability

Reform efforts seem to be a constant in educational circles, and in order to have reform, evaluation of practices and products must occur. The underlying assumption of that premise is that the product of educational practices can be quantified and assessed accurately.

In response to public and policy demands for accountability, numerous efforts have been directed toward identifying desirable "effects" and then finding something to cause those effects. Increasingly, then, we see that standards and performance indicators are turned into restrictive evaluation measures that often have no regard for the diverse contextual realities in which our schools exist. Accountability in these circumstances assumes that one set of standards can be equitably applied to everyone, regardless of context.

Einstein is credited with saying, "No problem can be solved from the; same consciousness that created it." If that statement is true, then educators must develop new ways of viewing and understanding our problems. Our old models assume that schools function within stable environments in which our students can be evaluated by the same set of prescriptive standards.

Linn (2000) suggests several reasons for the great appeal of assessment through high stakes testing and the accountability policies that often result. Those reasons are: testing and assessment are cheap, can be externally mandated, can be rapidly implemented, and results are visible. He also contends that research supports the notion

that test scores will increase in the first few years of a program with or without improvement in broader constructs.

AERA, in its position statement on high stakes testing (2000), points out that many policymakers support high-stakes testing with the intention of improving education. These supporters of high-stakes testing hope that setting higher standards will inspire greater effort by everyone involved in the educational process. The policy statement also points out that with these tests there is potential for serious harm. It is easy to understand how high test scores, rather than learning become the overriding goal of classroom instruction.

As we examine Alabama's SAT scores, it is perhaps fitting to note that, like many other states that use this norm referenced test, some of the material that is tested is not included in the mandated state curriculum. Hence, teachers must take classroom time to cover non-required material to be tested by the SAT, because administrators, parents, students, community leaders, and perhaps the teachers themselves, are all going to judge that teacher's ability to teach based on that score.

Results

Freeman and Teddlie (1996) noted "it is the fact that there were so many dissimilarities between the studies that makes the similarities in results ...interesting" (p. 18). Even though this study is somewhat similar to Freeman and Teddlie's study, and very different from the Gray study, the results are interestingly similar. To summarize the three studies, there are differences in sample sizes, basis for SEI, statistical analyses, and school configuration.

Table 2 compiles the resulting change from the three studies. In each box, the top score is from the Gray et al. (1995) study; the middle is the Freeman and Teddlie (1996) score, and is indicated by italics; and the bottom score is from the present study and is indicated by bold numbers. Cells 1, 5, and 9 indicate the percentages of schools that did not change in their levels of effectiveness over time. These schools are considered to be stable. Cells 4, 7, and 8 represent the schools that improved in their levels of effectiveness, while cells 2, 3, and 6 represent the schools that declined.

By examining the stable school percentages as represented in cells 1, 5, and 9, we find that Gray et al. (1995) found that 68% of the schools did not change. Freeman and Teddlie (1996) found around 64% of the schools in that study had failed to change, but the present study found that 77% of the schools had not changed in their levels of effectiveness. These findings reveal that the predictions made by Gray et al. (1995), that in any set of schools only one-fifth to one-fourth of the schools will have changed in their levels of effectiveness over time, were true for this study also. All three of the studies had results that fell roughly within the predicted range.

It is interesting that the number of schools that remained stable in the present study was 13% more than in the Freeman and Teddlie (1996) study. While it is difficult to say whether this difference is significant, it does raise the issue of consistency of SEIs. Since the present study results were based on averages of raw test data, it raises the question of whether this SEI is more or less valid than regression-based SEIs. The literature tells us that the regression model is an acceptable method of establishing SEIs.

Table 2

Comparative changes among schools in three studies

Score from year one	Score from year three		
	Top Quarter	Middle Half	Bottom Quarter
	Gray et al. (1995)		
Top Quarter	15%	6%	0%
Middle Quarter	9%	35%	9%
Bottom Quarter	0%	9%	18%
	Freeman and Teddlie (1996)		
Top Quarter	15.62%	8.04%	1.42%
Middle Quarter	8.83%	32.81%	8.20%
Bottom Quarter	0.63%	9.15%	15.30%
	Present Study		
Top Quarter	19%	7%	<1%
Middle Quarter	6%	38%	5%
Bottom Quarter	<1%	6%	20%

These results may reveal that using average raw scores as SEIs is less valid and should be avoided in classifying schools in high-stakes accountability programs, such as found in the state of Alabama.

Cells 4, 7, and 8 indicate the percentage of schools that improved in their levels of effectiveness over time. Gray et al. (1995) found that 18% of the schools in their study had improved, while Freeman and Teddlie (1996) found 18.6% had improved. The present study found that roughly 12% of the schools had improved. The first two studies were almost identical in the percentage of schools that improved, while the present study had 6% fewer schools that improved.

Cells 2, 3, and 6 indicate the percentage of schools that had declined in effectiveness levels over time. Gray et al. (1995) found that 15% of their schools declined, while Freeman and Teddlie (1996) found roughly 17% had declined, and the present study had 13% of the schools that declined in effectiveness levels over time.

In terms of movement or change in effectiveness status, the results again are very similar, with the present study indicating fewer schools were improving than in the other two studies. Again, this may be attributable to the fact that the SEI used in the present study may be less valid than the other two studies. Of course, the minor differences in the change in effectiveness levels over time may be more attributable to other variables besides any specific school improvement efforts in the individual schools.

Conclusions

The present study sought to partially replicate earlier studies that explored the degree of change in school effectiveness levels over time. The following conclusions can be made from the results.

1) The range of percentages for schools that change, as predicted by Gray et al. (1995), one-fifth to one-fourth, with roughly half improving and half declining, are similarly found in the other two studies. This strengthens the

notion that given a set of schools, it is predictable how many schools will be changing.

2) The differences found in the present study, while not necessarily significant, may indicate that the criteria and methods for establishing SEIs will result in unlike results. Further analysis of Alabama's test scores, where the same data are analyzed by different methods will bring about a clearer picture in this area.

3) All three studies reveal that less than 20% of schools improve over time, and it is very rare that a school would move from the bottom quarter to the top quarter, over a three-year period. This indicates that in reference to school effectiveness research, ineffective schools will take at a minimum, more than three years to become effective. Therefore, any school improvement project should not expect to see immediate results. Unfortunately, many projects are disposed after the first year or two, if the school shows no sign of improvement.

4) All three studies reveal that less than 20% of schools decline over time, and it is rare that a school would move from the top quarter to the bottom quarter, over a three-year period. This indicates that schools decline at roughly the same rate as schools improve.

5) While roughly 65% to 75% of the schools in all three studies remained stable in their effectiveness levels over time, a closer look at SEIs indicate that this is not a linear process. Some schools improved the second year and declined by the third year. This means that the effects of school improvement efforts may

not be consistent. It may indicate that school improvement efforts may have to adjust as a school makes its way up the effectiveness scale. If adjustments are not made, a school may begin to decline.

6) The present study indicates that the schools in Alabama, although involved in a statewide accountability program involving a high-stakes school improvement mandate, are not improving at any greater rate than the other studies that were not involved in such a program. This lends more credence to the notion that regarding school improvement efforts, one size does not fit all.

Appendix A
From the Alabama Administrative Code,
Education Accountability, Chapter 290-4-1

Education Accountability.

(1) The State Superintendent of Education is authorized to carry out the review, examination and supervisory responsibilities as prescribed in the Code of Ala. 1975, and to require reasonable and appropriate reports and to conduct hearings for the purpose of ensuring that due process requirements are met.

(2) Academic Assistance Program.

(a) Academic Alert - Local Schools. Local superintendents and local boards shall commit the resources necessary to improve the instructional program for schools on Academic Alert and shall budget to those schools all funds earned by the schools in the cost calculations of the foundation program.

1. Phase 1 (Self-study). Following the spring 1996 administration of a nationally normed achievement test and thereafter, the State Department of Education (SDE) will identify every school in Alabama with a majority of its students scoring in Stanines 1, 2, and 3 and notify said schools that they are being placed on Academic Alert. Schools placed on Academic Alert shall engage in a self-study to examine the reasons for low student achievement and shall develop a school plan for improvement. The SDE will assist local schools on Academic Alert in developing improvement plans and will also offer staff development.

2. Phase 2 (Outside Academic Improvement Teams). Following the spring 1997 administration of a nationally normed achievement test and thereafter, the SDE will identify the schools on Academic Alert from the previous year that have shown insufficient improvement in student achievement and place an Academic Improvement Team in each affected school. These teams of practicing professionals from outside the school shall visit each school on Academic Alert; conduct a study for improvement; consult with faculty, staff, and the community; analyze causes of poor student achievement; and make specific recommendations for improvement of student academic performance.

3. Phase 3 (Intervention). Following the spring 1998 administration of a nationally normed achievement test and thereafter, the SDE will identify the schools on Academic Alert from the previous two years that have shown insufficient improvement, and the State Superintendent of Education will appoint a person or persons from outside the school to run the day-to-day operations of the school. In considering intervention, the State Superintendent shall include factors such as dropout rates, attendance rates, special education enrollment, and other data necessary to properly interpret student achievement in each school.

(b) Academic Alert - Local School Systems. Following the spring 1996 administration of a nationally normed achievement test and thereafter, the SDE will identify every school system in Alabama with either a majority of its schools scoring Academic Alert or a majority of the students within a school system in which the students are scoring in Stanines 1, 2, and 3 and notify said school systems that they are being placed on Academic Alert. School systems placed on Academic Alert will follow the same procedures and be subject to the same accountability measures as identified in paragrap nd (a) 1., 2., and 3. for individual schools on Academic Alert.

(c) Academic Caution - Local Schools and Local School Systems.

1. Following the spring 1996 administration of a nationally normed achievement test and thereafter, the SDE will identify every school in Alabama that has not been placed on Academic Alert but has a majority of its students scoring in Stanines 1, 2, 3, and 4 and every school system in Alabama that has not been placed on Academic Alert but has either a majority

of its schools scoring Academic Alert or Academic Caution or a majority of the students within a school system in which the students are scoring in Stanines 1, 2, 3, and 4 and notify said schools and school systems that they are being identified as an Academic Caution school or school system. Schools and school systems classified in Academic Caution must show annual improvement on a nationally normed achievement test. If insufficient improvement is demonstrated between the first and second administration and thereafter, the school and/or system shall be governed by the sanctions for schools and systems on Academic Alert. The SDE will offer services to these schools and school systems regarding staff development and academic improvement.

2. The State Superintendent of Education shall have the authority to investigate the progress of schools and/or school systems within the category of Academic Caution which have demonstrated insufficient improvement and make a determination regarding placement in Academic Alert or Academic Caution.

(d) Academic Clear - Local Schools and Local School Systems. Following the spring 1996 administration of a nationally normed achievement test and thereafter, the SDE will identify every school in Alabama with a majority of its students scoring in Stanines 5-9 and notify said schools that they are being identified as an Academic Clear school. Each school system with a majority of the system's students scoring in Stanines 5-9 shall be declared an Academic Clear system. The SDE will offer services to these schools and school systems regarding staff development and academic improvement.

(e) All references to achievement/improvement relative to scores and status on norm-referenced test results shall be as follows:

1. Academic Alert Schools and School Systems. Schools and/or school systems scoring in Academic Alert that show a decrease of at least five in the percent of students scoring in Stanines 1, 2, and 3 will be considered to have made sufficient yearly progress or improvement as required by Act 95-313. School systems in Academic Alert by virtue of a majority of schools scoring in Academic Alert will follow Rules 290-4-1-.01(2)(e)(1) and (f) (1-4).

2. Academic Caution Schools and School Systems. Schools and/or school systems scoring in Academic Caution that show a decrease of at least two in the percent of students scoring in Stanines 1, 2, 3, and 4 will be considered to have made sufficient yearly progress or improvement. Schools and/or school systems achieving this standard remain in Academic Caution unless the percent of students scoring in Stanines 1, 2, 3, and 4 moves them to Academic Clear. Schools and/or school systems failing to make sufficient progress will be placed in Academic Alert Phase 1. School systems in Academic Caution by virtue of a majority of schools scoring in Academic Alert or Academic Caution will follow Rules 290-4-1-.01(2)(e)(2) and (f) (1-4).

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