

**POVERTY AND PRIVILEGE (CIRCA 1990): AN ELEVEN YEAR PERSPECTIVE ON  
TWO DIFFERENTIAL ACHIEVEMENT PREDICTORS**

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Abstract

Two characteristics of school districts (poverty and privilege), derived empirically from 1990 community demographics, are described as distinctly different characteristics of a school district. They are used to predict school district pass rates for 604 (of 608) Ohio public school districts on the Ninth Grade Proficiency Tests over an eleven-year period. Mean pass rate differences for these same school districts are also compared by high, middle, and low groups within poverty and within privilege over the eleven year period. The descriptions briefly note two time related trends. The first trend shows that proficiency test differences between groups of school districts within poverty and between groups of school districts within privilege diminish from 1990 to 1995. Similar conclusions are associated with the use of privilege and poverty as predictors of school district proficiency performance. A second trend from 1996 to 1998 shows the negative effects of poverty increasing while the positive effects of privilege are decreasing. A third trend for 1999 and 2000 is discussed within the context of state legislation that made public previous proficiency tests.

The statistical effects of poverty on school district mean pass rates are on the average four times greater than the effects of privilege over the period from 1990 to 1999, while during this same period poverty predicts school district performance about twice as well as privilege.

Running Head: long term effects of poverty and privilege

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Socioeconomic status, SES, generally refers to income, educational level, and occupation. An SES continuum assumes relatively high income, relatively high education, and a professional occupation at the high end and the logical opposite at the low end, relatively low income, relatively “low” education, and an unprofessional occupation. The term poverty is frequently used interchangeably with low SES. Contemporary efforts to define high and low SES are somewhat problematic inasmuch as direct quantification of SES is not achieved. Rather “indicators” of high and low SES are generally used to qualitatively define an individual as high, middle, or low SES, with the indicators frequently varying from study to study. When considering the relationship between SES and achievement research studies typically refer to high SES as associated with high achievement and low SES or “poverty” being associated with poor achievement.

While children of poverty like children of low SES have little access to books, writing materials, computers, and other tangible supports for education, certain contemporary social science researchers argue that poverty and low SES are distinctly different. Children of poverty in addition to the missing tangibles must regularly deal with *undesirable events* such as home evictions (for some families every two to three months), physical illness, chronic dental problems, chronic pain, criminal assault, teenage pregnancy, child neglect, child abuse and ever present *undesirable conditions* such as easy access to drugs, inadequate housing, inadequate clothing, inadequate diet, poor health care, environmental toxins, missing siblings and parents (either dead, incarcerated, or just plain missing), meager wages or living on welfare (McLloyd 1997, 1998; Payne & Biddle 1999; Roscigno & Ainsworth-Darnell 1999; Kozol 1991). Payne & Biddle (1999) note that it is difficult

to find even a single study where poverty was examined by itself as an indicator of home disadvantage with regard to achievement.

It would seem logical to consider high SES as representing the high end of a privilege continuum and high poverty as representing the high end of a poverty continuum, two continua rather than a single continuum. A continuum implies quantification in terms of determining points from one end to the other end of the continuum, but researchers have not yet come up with a reasonable way to quantify either extreme variation in or extreme variation in poverty privilege. At best, indicators are used to suggest membership in qualitatively different groups.

In several studies of Ohio school districts indexes<sup>1</sup> of poverty and privilege have been developed. Each index has a continuum associated with it. The indexes are derived from community demographics and implicitly describe the collective children associated with the given school district. As such the index of privilege may be thought of as an *index of child privilege* and the index of poverty may be thought of as an *index of child poverty*. The two indexes together describe the general SES of the community served by a school district<sup>2</sup>.

The objective of this study is to describe the association that privilege and poverty, as determined by 1990 demographics, have with school district achievement, as measured by the Ohio Ninth Grade Proficiency Tests over the eleven-year period from 1990 to 2000. In the discussion to follow: the assumptions and procedures associated with the determination of child poverty and child privilege are discussed; school district groupings by poverty and privilege are described within the context of a collection of demographic variables; effects of poverty and privilege associated with school district performance differences are summarized yearly, from 1990 to 2000, for proficiency differences between high, middle, and low poverty groups and for proficiency differences between high, middle, and low privilege groups; the

predictability of Ohio proficiency performance is described yearly using poverty as a predictor and then using privilege as a predictor; finally certain conclusions regarding the differences between privilege and poverty are summarized.

## **Methods**

### **Some Descriptions of and Indicators Defining Privilege and Poverty**

Researchers looking at achievement have consistently identified several variables as indicators of “SES” and have demonstrated that these variables are related to achievement performance. These variables generally include parental education, family income, marital status, and indicators of “poverty” such as welfare support (Cooley 1993; Downey 1995a; Dubrow 1994; George 1993; Kennedy 1986; McLanahan and Sandefur 1994; Meneghan 1996; Payne & Biddle 1999; Roscigno 1995, 1998, 1999; Zill 1996). Based on these findings and other study analyses six demographic variables were selected as general indicators of SES<sup>1,3</sup>.

Two of the variables, percentage of community adults with a four year college degree or higher (an indicator of privilege) and percentage of community adults not completing high school (an indicator of poverty), represent the two educational extremes that one would expect in a community. Most studies tend to use one or the other, but not both.

The percentage of single parent households (an indicator of poverty) was also selected for inclusion. Some researchers suggest that percentage of single parent-female households is a good indicator of poverty, research with Ohio school districts suggests that percentage of single parent-female heads of households is a better predictor of school district achievement than percentage of single parent-male heads of household, but simply the percentage of single parent households is a better predictor than either of the gendered figures. Gender of parent is not a major concern since the basis for including this indicator is that it represents family turmoil and disruption, suggesting an unbalanced socialization environment and most likely restricted financial resources (see Roscigno & Ainsworth-Darnell 1999; Hetherington, Cox & Cox 1978; Sandefur, McLanahan, and Wojtkiewicz 1992).

To represent income two indicators were used average household income (privilege) and percentage of school children receiving welfare support (poverty). Since high income is associated with privilege - it is reasonable to assume that relatively high average household income is suggestive of community privilege. The greater the percentage of school age children receiving welfare the greater the associated poverty in the school district.

The sixth and final indicator was suggested by Cooley (1993) and George (1993). The final indicator is the percentage of school age children attending the public school. This indicator when relatively low suggests that a relatively large percentage of children are attending private schools (an indicator of privilege).

These six "variables" are based on 1989 and 1990 data from the United States census and from annual 1990 information reported by Ohio school districts to the Ohio Department of Education. These "variables" are neither educational nor psychological measures. Rather, they are mostly frequency counts and better referred to as count variables (with the exception of average income) represented as proportions of the community adult population or proportions of the school district population.

Poverty and privilege, have been used to successfully study and understand differential school district performance on the Ohio Ninth Grade Proficiency Test<sup>1</sup>. Although the indexes are derived<sup>4</sup> from 1990 information they have been used to systematically study school district performance on proficiency tests from 1990, the inception of proficiency testing in Ohio, to 1999.

Each index has a mean of .50 and range from an approximate low of 0 to an approximate high of 1.00. An poverty value and a privilege value have been determined for every public school district in Ohio, 604 districts. There is a slight tendency for high privilege to be associated

with low poverty and low privilege to be associated with high poverty, but there are many exceptions to this trend<sup>5</sup>. The districts have also been grouped into high (highest 10%), middle (middle 80%), and low (lowest 10%) groups based on their privilege values and based on their poverty values. Index groups and indicators in Table 1 describe the school districts.

The indicators associated with privilege in Table 1 are % Bachelor - percent of community adults with a Bachelor degree, % dropout - percent of community adults who did not complete high school, average family income, %public - percentage of school age children who are attending public schools. Table 1 demonstrates that the high privilege school districts have relatively high values associated with these indicators, with the exception of % of adult high school dropouts, which is relatively low. The low privilege school districts have relatively low values associated with these indicators, with the exception of % of adult high school dropouts, which is high. Poverty is associated with %dropout, % 1 parent - percent of total households having school aged children and headed by a single parent, %ADC- representing the percentage of school age children qualifying for welfare. The high poverty school districts have relatively high values on all of the poverty indicators and the low poverty school districts have relatively low values on the poverty indicators - which can be verified by the entries in Table 1.

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Table 1 Descriptors of Poverty and Privilege Groups by Demographic Indicators - about here

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There are additional count variables included in Table 1 that are not directly associated with school district achievement and are not used to define the poverty and privilege. These count variables help to show some of the similarities of the poverty and privilege groups. Included are %2 parent - the percent of total households having school aged children

and having two parents, ppe - the per-pupil expenditure of a school district, %minority - the percent of school age children who are non-white, % high school - the percent of community adults having a high school diploma with no additional college experience, % household children 5-17 - the percentage of households with school age children, ave # preschool children - the average number of pre-school children per household, ave # school age children - the average number of school age children per household, ADM - the average daily attendance of the school district. The inclusion of these indicators in the table should provide some additional clarification of the characteristics of different subgroups represented in Table 1<sup>6</sup>.

High poverty, based on the indicators defining it, is associated with the previously mentioned **undesirable events** such as home evictions (for some families every two to three months), physical illness, criminal assault, teenage pregnancy, child neglect, child abuse and ever present **undesirable conditions** such as easy access to drugs, inadequate housing, poor health care, dangerous neighborhoods, and even environmental toxins. This index suggests the extent to which the presence of the above noted undesirable events and conditions exist within a community. Every school district in Ohio has “pockets of poverty”. Poverty at a community level is a long term condition which carries with it immense ramifications for the emotional and physical health of the school children coming from such conditions. The children collectively associated with high poverty have values, customs, survival skills, beliefs, fears, and experiences that are radically different from those children associated with middle and low poverty. These values associated with high poverty are not consistent with the those values, customs, survival skills, beliefs, fears, and experiences that most public schools associate with students who are generally successful achievers. From the perspective of a school district, a high poverty value is generally

indicative of the extent to which the children of the community will have difficulty with measures of school achievement. The higher the poverty value for a school district the lower the aggregate achievement of the school district.

High privilege values signify a community with access to some combination of valued commodities such as wealth, power, and social status. High privilege suggests “connections with and access to important decision makers”, a good working knowledge of advocacy (and possibly implicit intimidation). The children collectively associated with high privilege have learned academic survival skills as well as customs and values from parents who have experienced economic success and, for the most part, academic success; financial access to those “tangibles” assumed to be important for scholastic success (computers and reading materials) and freedom from fear and freedom from want. Many of these “gifts” of privilege are consistent with the expectations of public schools, and represent a general positive outlook on life in general and education in particular.

### **The School Districts, Proficiency Tests, and Interruptions**

Each public school district in the state of Ohio receives a yearly “score” for each subtest of the Ninth Grade Proficiency Tests. This score represents the percentage of students attempting the subtest who pass it on their first testing. The Ohio Ninth Grade Proficiency Tests were initially administered in 1990 and had four subtests: Writing, Reading, Math, and Citizenship. In 1996 a fifth subtest was added, Science. The school districts used in this study are the 604 school districts that participated in the testing program for all eleven-years. There were approximately six additional school districts that did not participate for the full eleven-years of testing. These school districts either merged with other school districts or emerged as new school districts during the eleven-year span from 1990 to 2000.

Annually the Ohio Department of Education reports proficiency test performance results by school district. Each year the proficiency test items changed. No two proficiency subtests are directly comparable, either within test year or across test years. Because of this it is unreasonable to make comparison of pass rates between various subtests in a given year or even across years. However, the differences between pass rates may be adjusted so that it is possible to determine if the difference between pass rates of two groups, say high poverty and low poverty on a math subtest, are comparable from one test year to another. The procedure for making such adjustments and comparisons involves a statistic called an effectiveness proportion. The effectiveness proportion is discussed in greater detail in the sections to follow.

The figures presented in the discussions to follow will have baselines representing the years from 1990 to 2000. In 1995 the state allowed eighth grade students to take the Ninth Grade Proficiency Tests along with the ninth graders. The scoring procedures for the proficiency tests also were modified after 1995. By 1997 most students taking the Ohio Ninth Grade Proficiency Tests for the first time were eighth graders. While there are anomalies associated with the Ohio Ninth Grade Proficiency Tests this change in years of schooling for those taking the tests as well as the changes in scoring make 1995 a year that is associated with major procedural interruptions. To represent this procedural interruption a solid vertical line associated with 1995 has been placed in all figures. A second major procedural interruption occurred after the 1998 administration of the Ninth Grade Proficiencies. This second interruption was legislation making the statements (items) of the proficiency tests available to the public, and of course to all school districts. Arguably, for many school districts business as usual changed when the previous tests became available for "use" in the schools. A vertical line has been placed between 1998 and 1999 to call attention to

this second major interruption. The reduction of differences between school districts was immediate noticeable in 1999 and even more apparent in 2000.

### **Effectiveness Proportions and Major Points**

An *Effectiveness Proportion* is used extensively in this study. It ranges from 0 to 1.00. An *Effectiveness Proportion* may be compared, contrasted, and manipulated quantitatively. In the discussion to follow an *Effectiveness Proportion* is generally used to represent the extent to which poverty and privilege are associated with school district Ninth Grade Proficiency Performance in any given year. The greater the proportion, the stronger the association of the index, poverty or privilege, with proficiency performance. A general “rule of thumb”<sup>7</sup> can be used for evaluating these proportions. A proportion of .10 or less is trivial and probably of little consequence for interpretation. A proportion greater than .10 but less than .25 is a medium size proportion suggesting a meaningful association. A proportion greater than .25 is a large proportion and implies that there is a strong meaningful association between the index used and school district performance on the proficiency tests. Proportions exceeding .36 are very large and not at all common and represent a very strong relationship. In the discussion to follow the proportions are used to graphically represent poverty and privilege trends with regard to proficiency performance over an eleven-year period, from 1990 to 2000. Two dotted horizontal lines have been placed in the three figures to follow. These are demarcations separating the proportion areas of the associated figure into trivial, small, medium, and large proportions.

In the discussion to follow two aspects of poverty and privilege are addressed. One aspect discusses differences between the mean achievement<sup>8</sup> (mean pass rate) for Ohio school districts as they are classified into high, medium, and low poverty schools and then for the

school districts as they are classified into high, middle, and low privilege schools. An effectiveness proportion will be associated with the difference between mean pass rates for two groupings, such as high poverty versus low poverty. The greater the associated effectiveness proportion the greater the difference in pass rates. These are the six groupings as described in Table 1, the schools are classified according to poverty and then re-classified according to privilege. The second aspect discusses how well individual school districts' achievement performances (pass rates) can be predicted, across all school districts in the state, on the basis of their poverty and privilege index values<sup>9</sup>. An effectiveness proportion will be associated with each index for each year. The greater the effectiveness proportion the greater the accuracy of the index for predicting general school district pass rates for the proficiency subtests within the given year.

In the discussion to follow there are three figures and a table. The discussion is systematic, drawing conclusions and making *Major Points*. Generally in research, writing major conclusions from a discussion represents major points of information and they usually follow from the discussion. In the "spirit" of enhancing the readability of this manuscript each conclusion is presented before its associated discussion and is noted as a *Major Point*. It is possible to quickly peruse the *Major Points* and skip the discussion leading to the points or use each *Major Point* as an advanced organizer for the discussion following it.

### **Mean Difference Effectiveness Proportion (MDE-proportion)**

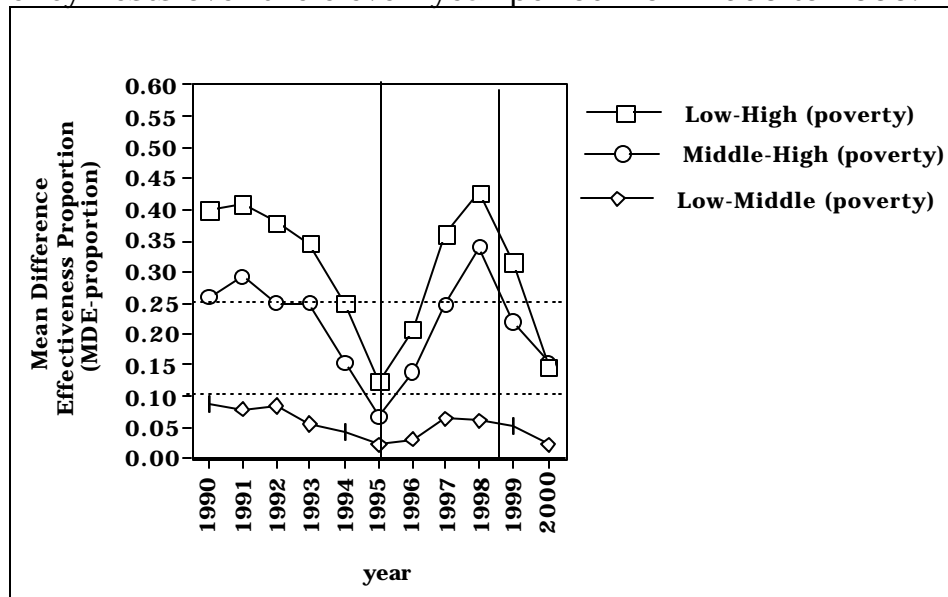
As previously noted in the discussion of Table 1 each school district was placed into a privilege group and also into a poverty group. Group placements were determined as high, middle, or low depending on the school district's associated values on privilege and on poverty, respectively. The discussion in this section will focus on differences between mean proficiency test pass rate for the three poverty subgroups

and also the difference for mean pass rate between the three privilege subgroups.

When comparing subgroup means across proficiency subtests within year for a particular index either privilege or poverty there are three subgroup comparisons: high with low; high with middle; middle with low. A *Mean Difference Effectiveness Proportion*, henceforth MDE-proportion, has been computed for each of the three comparisons. The MDE-proportion<sup>10</sup> represents the extremeness associated with the differences between the means of two subgroups across all proficiency subtests for a given year. It is a proportion and the greater its magnitude the greater the difference between the means associated with the two subgroups defining the difference, and the greater the effect<sup>11</sup> of the grouping characteristic, poverty or privilege, on the proficiency performances of the school districts defined by the subgroups. An MDE-proportion of zero would signify that for every proficiency subtest in the associated year the two subgroup associated with the proportion had identical means and that the basis for the grouping, either poverty or privilege, had no effect on the school districts' proficiency test performance. An MDE-proportion of one would signify that the two subgroups associated with the proportion had maximally different means and that the basis for the grouping, poverty or privilege, had a major effect on differential school district proficiency performance.

**Poverty MDE- proportions.** In Figure 1 the three sets of MDE-proportions have been plotted by year for the proficiency differences between: high poverty and low poverty school districts; high poverty and middle poverty school districts; middle poverty and low poverty school districts.

**Figure 1** Three sets of poverty MDE-proportions representing poverty subgroup mean pass rate differences on the Ohio Ninth Grade Proficiency Tests over the eleven-year period from 1990 to 2000.



**Major Point #1:** *High poverty school districts have substantially lower mean pass rates than either middle or low poverty school districts. Furthermore, low poverty school districts and middle poverty school districts tend to have similar mean pass rates.*

In Figure 1 the greatest MDE-proportions are associated with the mean differences in pass rates between high and low poverty groups. Although not explicitly shown there is a poverty trend that holds across all eleven-years, the high poverty group always has the lowest mean pass rate on every subtest. The smallest MDE-proportions are associated with the differences between middle and low poverty groups. The three sets of MDE-proportions show similar trends, decreasing from 1990 to 1995 and then increase from 1996 to 1998. The three sets of lines, representing the three sets of group comparisons, are delineated from each other by the general magnitude of their MDE-proportions.

After 1998 all MDE-proportions decrease relative to the other post-1995 proportions. Referring to Figure 1 it is clear that for 2000 the MDE-proportion for the middle- low poverty group comparison is almost zero, suggesting that the difference between low and middle poverty proficiency pass rates is practically zero, identical pass rates. It is also apparent in Figure 1 that the differences between the high poverty school districts and the middle and low school districts has been reduced to an MDE-proportion of approximately .15, the second smallest MDE-proportion associated with poverty over the eleven years of testing. One possible explanation for this is that the available previous proficiency tests (public availability mandated by the Ohio legislators in 1998) were used to supplement school curriculum and as a consequence the differences between the three poverty groups were diminished.

The low-high MDE-proportions, associated with the differences between the low and high poverty school districts, are, with the exception of 1995, either in the “high” or “very high” range, according to the previously mentioned rule of thumb for interpreting effectiveness proportions. This indicates that the high poverty school districts have a substantially lower mean pass rate than the low poverty schools. The middle-high MDE-proportions are, with the exception of 1995, 1996 and 2000, all within the “large range” indicating that the pass rate of the high poverty school districts is substantially lower than the pass rate for the middle poverty schools. The low-middle MDE-proportions are in the small range, indicating that the difference in pass rates between the low and middle poverty groups are trivial.

Generally, the differences represented in Figure 1 suggests that the high poverty school districts have lower pass rates than either the middle or low poverty school districts and that low poverty school districts and middle poverty schools have similar pass rates.

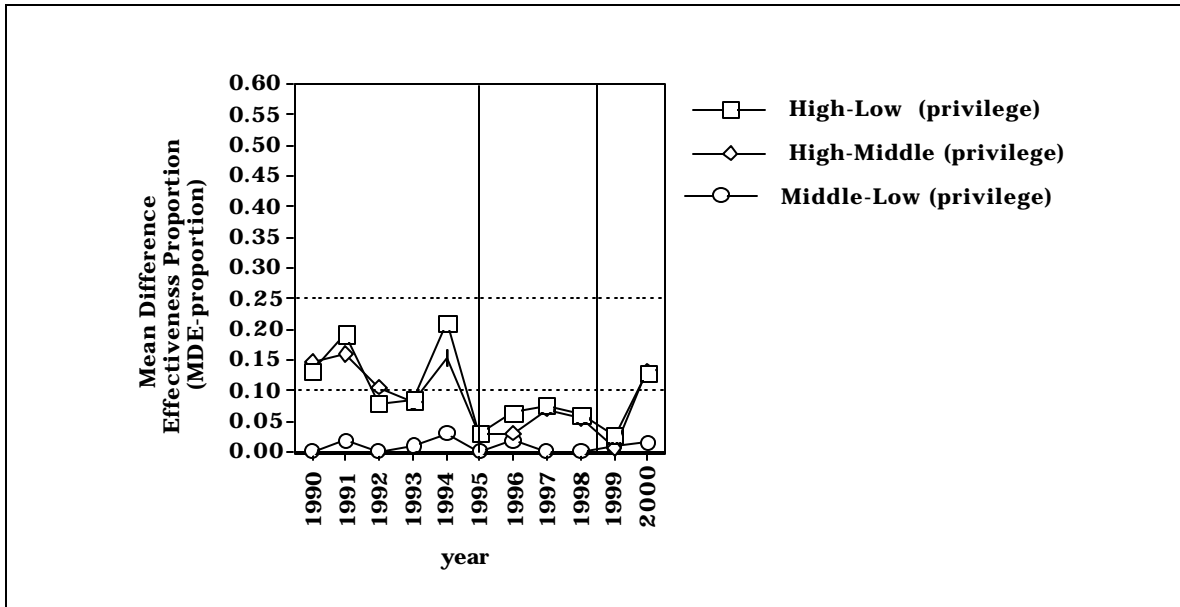
**Major Point #2:** *“Making public” previous proficiency test, after the 1998 testing, is associated with reduced MDE-proportions for the poverty groups i.e. appearing to making the poverty groups mean pass rates more similar.*

There is a second trend in Figure 1. Looking at the years from 1990 to 1995 it is apparent the association between poverty groups and school district performance becomes less for each subsequent year, MDE-proportion gets smaller each year. This trend is logical since it is generally true that the greater the time between two measures the weaker the empirical association between the measures. However, the trend showing a growing increase of the magnitude of the MDE-proportion associated with the high poverty group after 1995 was quite unexpected. This would suggest that the mean pass rate for the high poverty group is becoming smaller relative to the mean pass rates of the middle and low poverty groups. The 1998 MDE-proportion is the greatest proportion over the first nine years of proficiency testing. There is a dramatic drop in the MDE-proportion for 1999 and 2000, after the proficiency tests were “made public”. The reduction in the proportions for 1999 and 2000 indicate that the mean pass rates for the three poverty groups are becoming more similar. Specifically the middle-low MDE-proportion is almost zero suggesting that the middle and low poverty groups have very similar mean pass rates. The reduction of the high-low and high-middle MDE-proportions for 1999 and 2000 suggests that the high poverty group mean pass rate is becoming more similar to the middle and low poverty groups’ pass rates.

**Privilege Mean Difference Proportions.** In Figure 2 the three sets of MDE-proportions have been plotted by year for the proficiency

differences between: high privilege and low privilege school districts; high privilege and middle privilege school districts; middle privilege and low privilege school districts.

**Figure 2** Three sets of privilege MDE-proportions representing privilege subgroup mean pass rate differences on the Ohio Ninth Grade Proficiency Tests over the eleven-year period from 1990 to 2000



**Major Point #3:** *High privilege school districts tend to have higher pass rates than the middle and low privilege school districts. Furthermore, the low privilege school districts and the middle privilege school districts have similar mean passing rates over the eleven-year period.*

Although it is not apparent in Figure 2, the high privilege school districts, without exception, have the highest pass rates on all proficiency subtests over the eleven-year period. The MDE-proportions associated with the differences between middle-low privilege subgroup

mean pass rates are so small that they effectively suggest no differences between the middle and low privilege subgroups. However, the MDE-proportions associated with the high privilege subgroup comparisons, with both middle and low privilege subgroups, indicate that the school districts associated with high privilege tend to have highest relative passing rates.

**Major Point #4:** *“Making public” previous proficiency tests, after 1998, is associated with a large increase in the high-low and high-middle privilege MDE-proportions for the year 2000. This suggests that high privilege school districts have increased their average pass rates relative to the middle and low privilege schools. The MDE-proportion for the middle-low privilege differences is very low and unchanged, suggesting no advantage for either of these two groups.*

The years of 1999 and 2000 show very little change in the differences between middle and low privilege school districts. However, the high privilege school districts experience a substantial growth in average percent pass relative to the middle and low privilege school districts, as is shown by the elevated MDE-proportion for the year 2000. It is possible that the high privilege schools were able to use the previous proficiency tests more effectively than the middle and low privilege schools.

After excluding 1999 and 2000, Figure 2 indicates that with the exception of 1990, 1991, and 1994 the MDE-proportions associated with the differences between the high privilege school districts and the low and middle privilege school districts are in the trivial range. However,

with the exception of 1992, the largest mean differences are associated with the differences between the high and low privilege schools.

The privilege MDE-proportions for 1995 through 1998 are smaller than the MDE-proportions before 1995. While the trend for the MDE-proportions suggests that the proportions are getting smaller with the passage of time.

**Major Point #5:** *The association between poverty and proficiency performance has become stronger with the passage of time, with the high-low poverty effectiveness proportion of 1999 exceeding the high-low poverty effectiveness proportion of 1990. The association between privilege and proficiency performance has become weaker with the passage of time, with all high-low privilege effectiveness proportions prior to 1995 exceeding all high-low privilege effectiveness proportions after 1995, with the exception of 2000.*

When comparing Figures 1 and 2 there is a common trend before 1995 and a different common trend after 1995, and still another trend for 1999 to 2000. From 1990 to 1995 there is a general reduction of MDE-proportions, with several exceptions. From 1996 to 1998 there is relatively growth in the magnitude of the high-low poverty MDE-proportions, eventually becoming larger in magnitude than the effectiveness proportions prior to 1995. However, from 1996 to 1998 there is a much smaller growth trend for the high-low privilege MDE-proportions. Unlike the poverty growth trend the privilege growth trend tends to have MDE-proportions that are relatively smaller than those in the years prior to 1995. The trend for 1999 and 2000 most likely

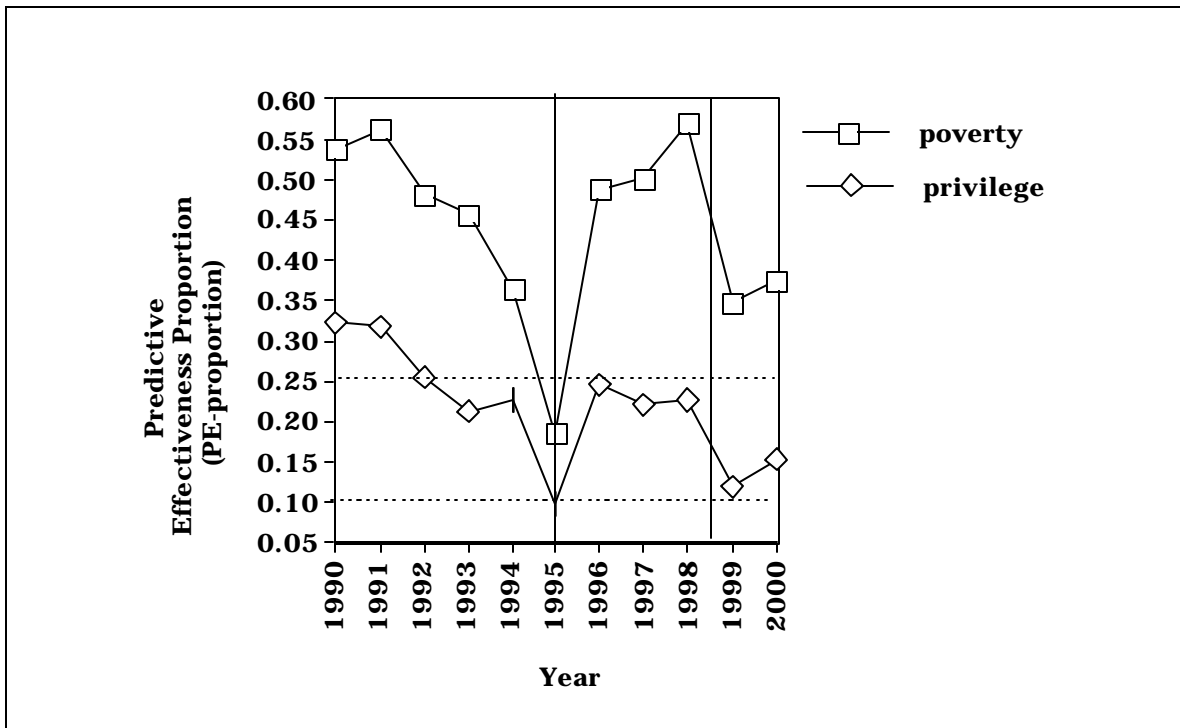
represent an influence of the use of previous proficiency tests as part of the curriculum.

**Predictive Effectiveness Proportion: PE-proportions**

For each indicator a *Predictive Effectiveness Proportion*, henceforth PE-proportion, was determined<sup>12</sup> by year as a summary representing how well the actual poverty and privilege values predicted the four, or five depending on the year, proficiency subtests for all 604 school districts. The resulting PE-proportions reflect the accuracy of prediction associated with the index, poverty or privilege, used to make the predictions for a given year. As with the MDE-proportion the higher the PE-proportion the more accurate the associated predictions. The highest possible value is 1.00 representing perfect prediction, implying a strong linear relationship between the associated indicator, poverty or privilege, and proficiency performance across all subtests for all 604 public school districts for the given year. The lowest possible value is 0 representing no predictive accuracy and implying no linear relationship between the associated index and proficiency subtest performance across all 604 public school districts.

The PE-proportions for each year, 1990 through 2000, were determined for poverty and privilege and have been plotted in Figure 3.

Figure 3. *Predictive Effectiveness Proportions* for poverty and privilege over an eleven-year period.



**Major Point #6:** *For every year poverty is a better predictor of Ohio Ninth Grade Proficiency performance than privilege.*

With the exception of 1995 all poverty PE-proportions are in the large range. The privilege PE-proportions fall within the trivial, medium, and large ranges. One trend represented in Figure 3 is that for every test year the poverty PE-proportion is greater than the privilege PE-proportion.

**Major Point #7:** *Poverty as a predictor, in the high PE-proportion range, becomes stronger with the passage of time after 1995 through 1998. Privilege as a predictor is stable, in the middle PE-proportion range, from 1991 to 1998, with the exception of 1995.*

TA second trend is that the general predictability of the proficiency tests decreases from 1990 to 1995 for both poverty and privilege. There is a substantial increase associated with poverty from 1996 through 1998, with the 1998 PE-proportion being the largest proportion over the eleven years of testing. While there is a small increase in the privilege PE-proportion for 1996 there is a drop in 1997 that remains unchanged for 1998. Effectively, with the exception of 1995 the privilege PE-proportion starts out as a large proportion in 1990 and 1991 and then drops into the middle range and remains stable from 1992 to 1998, and drops into the low middle range after 1998.

**Major Point #8:** *The benefits associated with "making the proficiency tests public" are not spread in any orderly manner across all school districts.*

After "the tests were made public" in 1998 the predictability associated with both indexes dropped sharply in 1999 and 2000. This suggests, like the reduction in MDE-proportions, that the benefits of the use of previous tests are not spread across all of the school districts in any "orderly" manner. In particular as suggested by Figures 1 and 2 the the pass rates within the high poverty group are increasing relative to the middle and low poverty groups and the pass rates within the high privilege group are also increasing relative to the middle and low privilege groups.

**Ratios of Effectiveness Proportions.** The strongest effects associated with privilege and poverty tend to be associated with extreme performance of the school districts. Poverty tends to be associated with extreme low performance, while privilege tends to be associated with high performance.

It is informative to form the ratio of effectiveness proportions, by year, of the high-low poverty MDE-proportion, represented in Figure 1, to the low-high privilege MDE-proportion, represented in Figure 2. For any given year the ratio indicates how much greater the poverty effect is relative to the privilege effect. The ratio by year is reported in the second column of Table 2. The PE-proportions are also represented as ratios, poverty to privilege, in the third column of Table 2.

Table 2. Ratio of high-low poverty MDE-proportion to high-low privilege MDE-proportion and ratio of poverty PE-proportion to privilege PE-proportion.

Year	Ratio of Effectiveness Proportions poverty/privilege	
	MDE-proportion	PE-proportion
1990	3.04	1.66
1991	2.13	1.77
1992	4.80	1.90
1993	4.08	2.15
1994	1.19	1.60
1995	3.84	1.88
1996	3.19	1.98
1997	4.80	2.27
1998	5.00	2.52
1999	5.00	2.88
2000	1.15	2.48
average 1990-1998	3.84	1.90
average 1999-2000	3.07	2.68

**Major Point #9:** *The differences between high and low poverty school district mean pass rates are, on the average from 1990 to 1998, approximately four times greater than the differences between high and low privilege school district mean pass rates. Poverty as a predictor of differential school district performance on the proficiency test is, on the average from 1990 to*

*1998, approximately twice as good a predictor as privilege.*

From the figures and previous Major Points it follows that poverty has a greater general effect on school district pass rates than does privilege, but just how much greater is shown by the ratios in Table 2. For 1998 and 1999 the low-high privilege MDE-proportions are so small that when expressed as a ratio to the low-high poverty MDE-proportions their ratios is greater than 100. For these years the ratio is arbitrarily set to five, reflecting a large ratio relative to the other ratios - but not distorting the average ratio. The poverty MDE-proportions, with the exception of 1994 and 2000, are between two and five times greater than the privilege MDE-proportion associated with the same year. Poverty PE-effectiveness, third column, is between 1.7 and 2.9 times greater than privilege PE-effectiveness.

### **Summary & Conclusions**

The preceding discussion addresses poverty and privilege from a research perspective, as constructs that help to predict and understand differential school district performance on the Ohio Ninth Grade Proficiency Tests. As suspected, and emphasized by many newspaper writers, high privilege is associated with high percent pass rates on the proficiencies and high poverty is associated with extreme low percent pass rates on the proficiencies. Over the nine year period from 1990 to 1998 the difference in pass rates between high poverty schools and low poverty schools are, on the average, approximately four times greater than the differences in pass rates between high privilege schools and low privilege schools. It may be a surprise that the effects of poverty are substantially stronger than the effects of privilege. For many it also may come as a surprise that low privilege is not associated with extreme low pass rates and low poverty is not associated with extreme high pass

rates. While each index is distinct in terms of how it predicts proficiency performance, collectively privilege and poverty are excellent predictors of school district achievement. Poverty and privilege are different constructs, as suggested in the introductory parts of this manuscript and by the demographic variables in Table 1, and by the effectiveness proportions represented in Figures 1,2, and 3..

The discussion of the different figures referred to two different interruptions during the eleven years of proficiency testing. The first interruption in 1995 was not discussed in detail. What is clear from the figures is that from 1990 to 1995 proficiency performance differences were being reduced between poverty groups and also between privilege groups. This reduction of performance differences could be viewed as evidence of growing equity in Ohio school districts. It could reflect the effects of a changing curriculum that was adapting to proficiency objectives. The proficiency tests underwent substantial change and modification in content, scoring, and passing thresholds during the first six years. A major change in test population from ninth graders to eight graders was also initiated in 1995. The trends after 1995 are very clear. The differences in pass rates between poverty groups became larger and larger, with the major difference occurring between the high poverty group and the other two poverty groups. Essentially the pass rate for the high poverty groups was diminishing relative to the other two poverty groups, i.e. a substantial growth of inequity disfavoring the high poverty schools. At the same time there was a very small increase in the passing rates for the high privilege schools relative to the middle and low privilege schools, also representing an inequity that favored the high privilege schools. The trends associated with the predictions represented in Figure 3 lead to the same conclusions. It appears as though 1995 marked a change from growing equity in Ohio schools to growing inequity. A clear explanation for this change in trend is not apparent.

The statistical procedures used in this study provided perspectives that treat poverty and privilege as distinct. However, poverty and privilege exist together in every public school district in Ohio. It is the mix of poverty and privilege that ultimately determines how difficult it is to teach the children of a given community<sup>13</sup>. When we see that poverty is a consistently good predictor of school district performance, and when we keep in mind that poverty primarily predicts lower performance, we are forced to come to one logical conclusion - a conclusion missed by most newspaper writers and many contemporary critics of proficiency testing. That point is that the collective children from poverty, as represented in each school district by the poverty index, **regardless of the school district that they are** in, are doing more poorly on proficiency tests than the other children in Ohio. Many “pockets of poverty” are hidden by larger “pockets of privilege” and simply aren’t recognized by a public that focuses solely on the very visible high privilege and high poverty school districts. The pedagogy used in Ohio schools is not, in general, serving the children of poverty<sup>14</sup>. But, the discussion of poverty in the early part of this manuscript certainly implies that the children of poverty live lives of high risk - not just high risk of poor achievement, but also high risk of not reaching functional adulthood. Indeed, should the schools be held accountable for solving the problems of child poverty or should this be a responsibility of society in general?

A second major interruption in 1998 is associated with radical changes in the poverty, privilege, proficiency trends for the 1999 and 2000 testing years, showing that something did happen in the high poverty and high privilege groups. In particular the mean pass rates for the high poverty school districts increased relative to the middle and low poverty schools. However, the mean pass rates for the high privilege schools also increased relative to the middle and low privilege schools.

Also as suggested by Figure 3 the predictability of school district differences based on poverty and privilege “dropped” quite dramatically after 1998. This too, suggests that privilege and poverty differences from one school district to another are not explaining proficiency performance differences as well as they did prior to 1999. It is likely that not all school districts have profited from “public exposure”; that the high poverty and high privilege groups have profited the most with the high privilege group showing the greatest gains. While this is certainly “good news” the effectiveness proportions associated with poverty are still quite substantial and the question of whether it is possible to determine an effective pedagogy for children of poverty remains.

Unfortunately Ohio no longer gives an annual Ninth Grade Proficiency Test, so it won't be possible to determine if the general “drop” in effectiveness proportions, growth of equity, after 1998 will persist or if the effectiveness proportions will begin to rise again, growth of inequity.

## **Epilog**

The fact that “1990 poverty” persists as an excellent predictor of school district performance even after “public exposure of the proficiency tests” is evidence that the school district curriculum efforts have had relatively little impact on the collective children of poverty over a whole generation of school children. Even a small degree of poverty in a school district has a negative effect on the aggregate school district proficiency performance.

Poverty and privilege are measuring distinctly different aspects of a community, representing complementary constructs. When attempting to explain differential aggregate school district achievement community demographics are of immense importance. Using privilege and ignoring poverty, or assuming poverty to be the opposite of privilege will provide an incomplete spectrum of the effects of community demographics on

school district achievement; so also will the use of poverty, ignoring privilege, or assuming privilege to be the opposite of poverty. There is much to be learned by studying the effects of either privilege or poverty on a school district, but one must be clear with the definition of indicators of either poverty or privilege and one must be clear in terms of understanding what is being studied when using either poverty or privilege.

To be sure, knowing that a community has a lot of “big houses” will allow us to predict relatively high performance on proficiency tests, possibly helping us to understand the basis for high achievement. But knowing that a community does not have a lot of “big houses” will not allow us to predict low performance, or even help us to understand the basis for low performance on proficiency tests.

As I have observed and listened to parents, teachers, children, and administrators in proficiency testing environments I frequently reflect on a metaphor based on old cowboy movies. A stagecoach is hurtling down the dusty, bumpy trail with the driver madly (insanely) whipping the horses, trying to go faster and faster - inevitably - the stagecoach speeds up, faster and faster, only to either crash or violently roll over in a reckless cloud of dirt. When I think of this metaphor I’m never sure who the driver represents (legislators, parents, teachers, or administrators), who the horses represent (parents, teachers, administrators, or children), or whether or not there are survivors. One thing is always clear - they are running from something - but I’m never sure what it is.

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### **END NOTES**

<sup>1</sup> In a series of AERA papers (Hofmann 1996, 1997, 1998, 1999) an extensive collection of community demographics and school variables were studied in terms of their capacity to predict school district

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performance on the Ohio Proficiency tests. Three grade levels of proficiencies were used, 4,6, and 9. Over time the demographic variables were reduced to six variables. A confirmatory factor solution was developed using maximum likelihood factor analysis. Factor scores were used to represent two constructs that defined the six demographic variables.

<sup>2</sup> It is important to refrain from making generalizations to individual children on the basis of the indexes since the actual sampling unit used to determine each index is the community served by the school district - or more generally the school district. Attempting to make generalizations to specific individuals can result paradoxical conclusions. For instance, there are some school districts in Ohio that are high poverty and high privilege, but one would never expect to encounter a child that would qualify as high privilege and high poverty. The SES of a school district is defined by the “mixture” of district poverty and district privilege.

<sup>3</sup> These demographic variables are excellent, independent ( are associated with good prediction with the other five variables held constant)predictors of school district performance on the Ohio Ninth Grade Proficiency Tests (see Hofmann 1996, 1997, 1998, 1999)

<sup>4</sup> The indexes were derived using confirmatory maximum-likelihood factor analysis (EQS). They were specifically computed as a two factor oblique maximum - likelihood regression estimate factor scores, see Hofmann 1998. Each set of factor scores was transformed to have a mean of 50 and standard deviation of 8.55. This effectively scaled the two data sets so that for the two sets the lowest factor score was approximately 0 and the highest factor score was approximately 100.

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<sup>5</sup> The Pearson correlation between poverty and privilege is  $-.33$  and is statistically significant. This is not a particularly strong relationship. The exploratory maximum likelihood solution defined a correlation of  $-.45$  between the two factors. The confirmatory solution defined a correlation of  $-.36$  between the factors.

<sup>6</sup> Care was taken not to include these variables in analyses. Their inclusion with the variables would have resulted in linearly dependent variables, matrix singularity, and, ultimately, degenerate (potentially error laden) statistical solutions.

<sup>7</sup> Following Cohen (1988, p.25) and Rosenthal (1991, p. 20) the magnitude of effectiveness proportions may be qualified by ranges. Rosenthal derives an effect size correlation from Cohen's effect size index (see later footnote 10) and the effectiveness is derived from pooled squared "Rosenthal correlations". Cohen suggests that a correlation of  $.30$  is a medium size effect size correlation. Squaring  $.30$  results in a squared correlation, proportion, of  $.09$ . Cohen would suggest that a squared correlation less than  $.09$  is probably small. Here a squared correlation, effectiveness proportion, less than  $.10$  is referred to as trivial. Rosenthal and Cohen would suggest that an effect size of  $.36$  or greater is an extremely large effect size. For this study an effectiveness proportion of  $.25$  is somewhat arbitrarily selected as the upper limit for a medium sized effectiveness proportion and is substantially more conservative than the Rosenthal and Cohen  $.36^2$ , which would suggest a squared correlation or proportion of  $.13$ .

<sup>8</sup> This will involve the use of least square means and least square standard deviations. The poverty least square means and standard deviations will have privilege covaried out, held constant, and the least

square means and standard deviations for privilege will have poverty covaried out, held constant.

<sup>9</sup> This will involve ordinary least squares analyses using partial correlations, representing the relationship between poverty and achievement with privilege held constant and then the relationship between privilege and achievement with poverty held constant.

<sup>10</sup> Each pair of means was compared using a covariance analysis. When considering poverty groups privilege values were used as covariates and when considering privilege groups poverty values were used as *covariates*. Following the analysis *least square* means and standard deviations were determined. The differences between the *least square* means of two groups were converted to effect following Cohen's (1988) pooled variance approach for his *d*. Specifically:  $d = (\text{least square Mean}_{\text{group 1}} - \text{least square Mean}_{\text{group 2}}) / ((\text{least square Variance}_{\text{group 1}} + \text{least square Variance}_{\text{group 2}}) / 2)^{1/2}$ . When dealing with poverty group 1 will refer to the lower of the two poverty groups since the mean of the lower named group will always be larger than the mean of the higher named group. In this study group 1 will refer to the lowest poverty group and group 2 will be the highest poverty group. So when making comparisons, the lower poverty group will always be represented by group 1 and the higher poverty group will be represented by group 2. Rosenthal's (1991) effect size correlation, represents the correlation between the two poverty groups, a dichotomous variable, since the effect size is computed from the comparison of the two *least square* poverty group means, and a continuous measure represented by the mean proficiency score associated with each school district in the two poverty groups. This correlation is computed as,  $r = d / [d^2 + 4]^{1/2}$  (Rosenthal

1991). When computing mean differences by privilege group the higher named group will have the greatest mean so when computing an effect size group 1 will be associated with the higher named group and group 2 will be associated with the lower named group.

When considering the statistical manipulation of effect size correlations, computing average  $Z$ s, each correlation should be converted to a normal curve  $Z$  score as was done when computing *Predictive Effectiveness Proportions*. This is accomplished using the same Fisher formula reported in the footnotes for computing a PED. The major difference is that with the PED a partial correlation,  $p$  was used and here a correlation,  $r$ , representing effect size is used.

$$Z = 1/2[\log_e (1+r) - \log_e (1-r)]$$

The effect size correlations are average across all subtests for a given year and the average is then transformed back to an  $r$ :

$$r = (e^{2z} - 1)/(e^{2z} + 1)$$

This  $r$  is then squared to form the *Mean Difference Effectiveness Proportion*. The proportion generally represents the proportion of the variance of the subtests that can be predicted on the basis of subgroup membership.

<sup>11</sup> The term “effect” is used in the general sense of an ANOVA effect, to imply an association with a magnitude of difference between two means. The intention here is not to imply cause and effect and in the final sections a cautionary note is provided to remind the reader of the dangers of such thinking especially when using indicators.

<sup>12</sup> For each subtest a partial correlation was determined for poverty and a partial correlation was determined for privilege. The partial correlation represents the correlation between one index and a proficiency subtest

with the effects of the other index held constant. For example the partial correlation between poverty and Math would represent the correlation between poverty and Math with the effects of privilege held constant for all school districts.

All partial correlations were converted to  $Z$  using the Fisher (1970, p 212)  $r$  to  $Z$  transformation. This was accomplished using the following equation, where  $p$  is a partial correlation.

$$Z = 1/2[\log_e (1+p) - \log_e (1-p)].$$

The  $Z$  values associated with poverty were averaged and the  $Z$  values associated with privilege were averaged. The two average  $Z$  values were each transformed back to an average partial correlation using the following equation.

$$p = (e^{2z} - 1)/(e^{2z} + 1)$$

The partial correlation for poverty was squared to provide a general estimate of the average proportion of variation of the subtests that was associated with poverty, with privilege held constant – The *Predictive Effectiveness* based on the collection of subtests representing the yearly Ninth Grade Proficiency Tests.

Although not reported in the text all partial correlations associated with poverty were negative and all partial correlations associated with privilege were positive.

<sup>13</sup> Cooley's use of the term "difficulty of the educational task" when he refers to demographic characteristics of certain schools as being indicative of how difficult it is to teach the children of a school district. Hofmann's Index of Difficulty of the Education Task (DOT index) provides a quantitative value, based on poverty and privilege, for every public school district in Ohio that indicates how difficult it is to teach the

children within the community served by the school district. It also provides a basis for comparing one school district to another to determine which has the more difficult population to teach.

<sup>14</sup> M.K. Lorenz, a Miami University doctoral student in Educational Leadership is completing a dissertation, May 2001, that was a study of “proficiency” teachers, teachers who teach children the year that the children take a proficiency test, in several different schools. Her schools varied in terms of school district success on the proficiency tests. It came as a distinct surprise when she determined that the teaching methods and curriculum were very similar across all the school districts that she studied. The major differences between the school districts, based on teacher perspective, were parental involvement, student “attitude”, and teacher expectations.

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Table 1 Descriptors of Poverty and Privilege Groups by Demographic Indicators

	Child Poverty						Child Privilege					
	Low (n=60)		Middle (n=484)		High (n=60)		Low (n=60)		Middle (n=484)		High (n=60)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
% <b>Bachelor</b> privilege	24	17	12	08	09	05	06	02	11	05	38	11
<b>Ave Income</b> privilege	\$34174	\$15681	\$24954	\$5631	\$20191	\$2456	\$20488	\$1714	\$24071	\$2897	\$41517	\$14960
% <b>Public</b> privilege	90	07	89	08	92	07	97	04	90	07	79	07
% <b>dropout</b> privilege-poverty	14	06	23	07	34	07	34	08	24	06	11	04
% <b>single paren</b> poverty-	07	02	13	04	23	07	14	05	14	06	10	04
% <b>ADC</b> poverty	02	02	08	06	27	10	17	10	09	08	02	03
ppe	\$3796	\$949	\$3478	\$784	\$3722	\$630	\$3235	\$508	\$3413	\$566	\$4747	\$1327
%High School	37	14	42	08	38	06	44	07	43	07	24	07
% 2 parents	79	12	74	12	61	15	72	13	73	14	72	13
% household children 5-17	34	5	33	05	31	06	34	04	33	05	20	06
% minority	03	03	04	07	19	25	02	04	06	12	07	10
ave # preschool children	.11	.05	.11	.05	.12	.06	.13	.08	.12	.04	.08	.02
ave #school age children	1.80	.15	1.71	.11	1.65	.09	1.69	.12	1.71	.12	1.75	.09
ADM	1983	1934	2427	1989	3818	4687	1574	863	2497	2469	3574	2592
Child Poverty	.39	.02	.49	.05	.68	.07	.55	.08	.50	.08	.42	.05
Child Privilege	.57	.13	.50	.08	.46	.06	.40	.12	.49	.05	.70	.06

