Beating the Odds:

Analyses of 2007 DSTP

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Executive Summary

This study was designed to identify K-12 schools in Delaware that are beating the odds, that is, outperforming expectations given the composition of their student body, and to learn what actions they are taking to achieve their success. This third stage repeats the identification process used with the 2007 Delaware State Testing Program (DSTP) data, relying on cluster analyses of Delaware public and charter schools' percentages of white students and students from low-income families. It also examines the stability of the school clusters and sample of identified schools from one year to the next.

- Three clusters were identified at the elementary, middle, and high school levels:
  - a high cluster that includes high percentages of white students and low percentages of students from low-income families,
  - a middle cluster that includes moderate percentages of both, and,
  - a low cluster that includes low percentages of white students and high percentages of students from low-income families.
- DSTP reading and mathematics NCE (normal curve equivalent) scores were used to calculate means for each cluster of schools at each level; schools that scored at least 3 NCEs higher than their respective means were identified as *exceeding expectations.*
- 19 schools were identified as a result of this process
  - 12 elementary schools,
  - 3 middle schools, and,
  - 4 high schools.
- Analyses of the 2006 and 2007 clusters' demographics provided moderate support for their stability in terms of their distribution and central tendency. Three clusters were identified each year, and the elementary and high school clusters were generally stable. The middle school clusters showed more variability across the two years.
- Comparisons of the schools identified as "beating the odds" in 2006 and 2007 revealed that a majority of schools identified in one year were not identified in a second year. This could occur because of differences in student populations and/or differences in their performance from one year to the next. Requiring schools to meet the criteria for multiple years would likely increase the reliability of the identification process.

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Introduction

This report documents the third stage of the *Beating the Odds Study***.** This study was designed to identify public and charter K-12 schools in Delaware that are "beating the odds," that is, outperforming expectations given the composition of their student bodies, and to learn what actions they are taking to achieve their success. Two research questions were identified to guide the study:

1. What Delaware schools are performing at a higher level on the Delaware State Testing Program (DSTP) than would be expected given their student demographic characteristics?

2. What actions are these schools taking that contribute to their higher level of student performance?

The first question was answered in an earlier report, *Beating the Odds: A Study of Delaware Schools* (Buttram, 2007). This report identified 29 schools that performed better than expected given their student populations based on analyses of 2006 DSTP scores. Sixteen of the 29 were elementary schools, 6 were middle schools, and 7 were high schools; these schools served students primarily from low-, middle-, or high-SES families.

Stage two of the study answered the second question above (Buttram, 2008). Surveys and interviews were conducted in a small sample of elementary schools identified in the first stage to determine what actions they were taking to achieve these higher patterns of student performance. Eight strategies were identified across the four schools, including setting specific goals by grade level for student performance on the state test, building a common language and framework for instruction, requiring quarterly assessments across all schools, conducting quarterly promotion and review meetings with teachers, expecting principals to conduct weekly walk throughs in all classrooms, supporting professional learning communities at each grade, providing instructional interventions to support struggling students, and scheduling "Data Day" at the end of each school year. These strategies, most likely, could not have been taken without strong school and district leadership.

The third stage of the study replicated the first stage, substituting the 2007 DSTP achievement scores for the 2006 DSTP scores. This replication was conducted to identify a second sample of schools "beating the odds" as well as to determine the stability of the school clusters and the sample of identified schools. Student populations in particular schools may change from one year to the next and so it is important to see if these movements significantly alter membership in the three clusters.

Methodology and Findings

This stage of the study relied on data available from the Delaware Department of Education public web site (http://www.doe.K12.de.us). The following information was downloaded: race/ethnicity and low income percentages for each of the 202 schools in the state as well as their 2007 DSTP grade-level normal curve equivalents (NCEs) in English/language arts and mathematics for grades 2-5 in elementary schools, grades 6-8 in middle schools, and grades 9-10 in high schools.

Identification of Clusters

The first task was to group the schools based on the demographic characteristics of their student populations. Similar to the procedures used in the first study (of 2006 DSTP scores), schools were grouped by the percentages of white students and the percentage of students from low-income families. Three clusters were identified at each school level using Cluster.xla (Cinquegrani, 2008); these clusters are presented in Table 1. Graphic representations are included in Appendix A.

Table 1
Percent of White and Low-Income Students at Each School Level and Cluster (2007)

School Level/SES Cluster	Number of Schools	Percent of White Students		Percent of Students from Low-Income Families	
		Range	Mean	Range	Mean
Elementary					
High	44	58.7-87.6	72.2	0-48.8	23.9
Middle	52	14.0-70.9	49.7	25.0-62.4	44.3
Low	29	0-35.1	19.5	50-87.6	67.9
Middle					
High	7	67.5-88.2	78.6	5.5-20.5	13.7
Middle	19	55.8-82.0	67.0	18.5-49.4	32.7
Low	17	1.0-54.6	33.9	33.8-87.6	53.5
High					
High	10	66.8-83.8	75.0	2.7-26.7	15.4
Middle	14	52.8-74.5	62.5	20.9-50.1	28.3
Low	10	30.2-56.4	42.2	31.0-43.6	38.8

The table is divided into three major groupings of data. The second column presents the number of schools in each cluster by school level. The third and fourth columns report the range and mean percent of white students in each cluster while the fifth and sixth columns present the range and mean percent of students from low-income families in each cluster. Each row represents a different SES cluster for each school level. For example, the high-SES elementary cluster includes 44 schools. These schools have a large percentage of white students (ranging from a low of 58.7 percent to a high of 87.6 percent) with a mean of 72.2 percent. Similarly, the high-SES elementary cluster has a

smaller percentage of students from low-income families (ranging from zero to a high of 44.8 percent) with a mean of 23.9 percent.

As might be expected, the three resulting clusters loosely reflected traditional SES pairings. That is, one cluster was comprised of high percentages of white students and modest percentages of low-income students (labeled high); a second cluster was made up of moderate percentages of white students and low-income students (labeled middle); and a third cluster included low percentages of white students and high percentages of students from low-income families (labeled low). Examination of the means reported in Table 1 confirms that the mean percentage of white students decreased from the high to the middle to the low cluster and that the mean percentage of students from low-income families increased from the high to the middle to the low cluster.

As the table illustrates, the size (i.e., number of schools) and range of the three clusters varied from one school level to the next. The middle cluster was the largest in size for all three school levels. The range of students' backgrounds was most restricted for the high school cluster, i.e., there were fewer students from low-income families enrolled in high schools. This restriction in range may be attributed to the reluctance of high school students to report eligibility for free lunch as well as the dropout rate for high school students from low-income families. Appendix B lists all of the schools by school level and cluster.

Analysis of DSTP Scores

Once the above clusters (or comparison bands) were established, each cluster's mean performance on the DSTP in English/language arts and mathematics was established for each school level. Rather than determine the percentage that reached proficiency or percentiles, these analyses calculated the mean normal curve equivalents (NCEs). Mean NCEs were selected because they provide a more complete measure of the entire grade's performance than the percentage that reached proficiency. NCEs, unlike percentiles, are an equal-interval scale and so can be directly compared. In Title I evaluations (which rely heavily on analyses of NCEs), differences of 3 NCEs are commonly accepted as significant. Table 2 reports the mean NCEs for reading and mathematics for each cluster by school level.

Table 2
Mean DSTP Reading and Mathematics NCEs by Cluster and School Level

School Level/ Cluster	Mean Reading NCE			Mean Math NCE		
	High	Middle	Low	High	Middle	Low
Elementary						
2nd	54.5	55.5	50.1	50.6	51.8	45.8
3rd	58.3	58.4	53.5	58.5	57.0	49.7
4th	62.9	63.5	61.7	60.5	60.3	57.5
5th	63.5	60.5	58.5	60.3	59.3	56.2
Middle						
6th	56.0	54.8	52.9	54.0	53.9	51.6
7th	65.5	60.4	56.8	59.4	54.2	49.7
8th	58.8	57.1	54.8	58.2	56.4	50.7
High						
9th	62.9	57.1	53.0	65.5	59.2	56.5
10th	60.3	57.9	53.5	61.0	56.4	52.1

The data in Table 2 are organized into two major groupings of data. The second through fourth columns report the mean reading NCE for each SES cluster, the last three present the mean mathematics NCE for each SES cluster. Each row of the table represents a different grade level. To illustrate, the mean reading NCEs for the sixth grade decreased from the high-SES cluster (56.0) to the middle-SES cluster (54.8) to the low-SES cluster (52.9). The sixth grade mean math NCEs showed a similar pattern decreasing from the high-SES cluster (54.0) to the middle-SES cluster (53.9) to the low-SES cluster (51.6).

Similar to the sixth grade reading and math NCE averages, the mean DSTP NCE scores decreased from the high-SES cluster to the middle-SES cluster to the low-SES cluster for all of the grades tested with four exceptions. Reading scores at the second, third, and fourth grade and mathematics scores at the second grade were consistently close between the high- and middle-SES clusters. Overall, the pattern of decreasing scores from the high-SES to the middle-SES to the low-SES cluster in reading and mathematics within a grade reinforces the validity of the cluster analysis.

Identification of Schools "Beating the Odds"

The next step was to identify schools with students from low-income families that scored 3 NCEs higher than the mean NCE for their particular cluster in both reading and mathematics in a majority of the grades tested at that particular school. Gains of this magnitude are generally considered significant and noteworthy. The number of schools varied by school level (see Table 3 below).

Table 3
Number of Schools That Outperformed Expectations

School Level	Scored 3 NCEs Above Mean	
	Number[a]	Percent
Elementary	13	10.4
Middle	2	4.7
High	3	8.8
Total	18	8.2

[a] The number of schools is based on the number with K-5 enrollments, 6-8 enrollments, and 9-12 enrollments that were included in the cluster analyses. Schools were counted more than once if they had enrollments across these grade ranges.

There were 13 schools at the elementary level that outperformed expectations, two at the middle school level, and three at the high school level. There were many more elementary schools that scored 3 NCEs above the mean than middle or high schools. As students grow older, the number of outliers decreased.

Tables 4, 5, and 6 present the scores of Delaware elementary, middle, and high schools that outscored the mean NCEs of their particular cluster. Each table is organized by cluster. The first row for each cluster lists the average percentage of white students (W), the average percentage of students from low-income families (L), and the mean reading (R) and mathematics (M) NCE scores for the students from low-income families at each grade level; these numbers are shaded green. Individual school data for each cluster for students from low-income families are summarized in subsequent rows. The table also indicates the percentages of white students (W) and the percentages of students from low-income families (L) for each school; these percentages are shaded yellow. For example, for the elementary high-SES cluster for second grade, the mean NCE for reading is 54.5 and 50.6 for math for students from low-income families. Lord Baltimore Elementary in the Indian River School District, a school in the high-SES cluster, had 92.1 percent white students and 21.1 percent students from low-income families. Second grade students from low-income families at this school scored 59.4 in reading and 58.3 in math, both much higher than the means for their cluster.

As summarized below in Table 4, 13 elementary schools across the state outperformed their cluster means in the majority of grades tested in the school. At the elementary school level, two schools were “beating the odds” in the high-SES cluster, seven in the middle-SES cluster, and four in the low-SES cluster. The Indian River School District had six elementary schools which could be described as “beating the odds.” The Christina School District had three, and Capital, Milford, Red Clay, and Smyrna each had one. The Indian River School District was also the only district to have schools in all three clusters to outscore expectations at the elementary level.

Table 4
Elementary Schools Identified as "Beating the Odds"

School	District	W/L	2R	3R	4R	5R	2M	3M	4M	5M
Mean-High		**72.2/23.9**	**54.5**	**58.3**	**62.9**	**63.5**	**50.6**	**58.5**	**60.5**	**60.3**
Lord Baltimore	Indian River	92.1/21.1	59.4	66.3	67.2	69.3	58.3	71.8	71.7	66.5
Clayton	Smyrna	83.4/20.4	57.6	61.2	69.4		53.7	61.1	68.6	
Mean - Mid		**49.7/44.3**	**55.5**	**58.4**	**63.5**	**60.5**	**51.8**	**57.0**	**60.3**	**59.3**
Henry Braden	Christina	49.8/31.7	62.2	63.5	62.4		63.6	60.4	62.5	
Robert Gallaher	Christina	45.3/39.6	57.4	64.4	69.6		59.0	65.0	70.0	
Thurgood Marshall	Christina	47.6/25.4	58.6	63.6	66.9		44.3	60.8	60.0	
East Millsboro	Indian River	59.7/52.6	68.8	62.2	68.7	66.6	63.8	64.0	73.3	67.6
Georgetown	Indian River	48.4/62.4	62.9	59.0	67.8	59.5	62.8	63.7	64.1	58.3
Long Neck	Indian River	70.9/55.1	61.1	68.2	73.9	69.3	71.0	71.2	67.4	70.9
Benjamin Banneker	Milford	60.1/41.6	58.3	63.0	65.4	67.9	58.8	63.2	65.1	65.7
Mean-Low		**19.5/67.9**	**50.1**	**53.5**	**61.7**	**58.5**	**45.8**	**49.7**	**57.5**	**56.2**
South Dover	Capital	48.4/52.7	56.1	54.7	65.7		51.8	53.7	63.3	
Frankford	Indian River	33.6/75.5	56.5	58.8	62.0	64.0	56.6	63.9	70.0	68.5
North Georgetown	Indian River	35.1/66.9	56.1	62.5	69.7	60.9	49.8	58.9	62.9	64.9
Marbrook	Red Clay	31.6/61.9	44.8	57.4	65.1	71.3	49.9	57.7	64.4	71.8

Table 5
Middle Schools Identified as "Beating the Odds"

School[a]	District	W/L	6R	7R	8R	6M	7M	8M
Mean-High		**78.6/13.7**	**56.0**	**65.5**	**58.8**	**54.0**	**59.4**	**58.2**
Sussex Academy of Arts and Sciences	Charter	87.3/10.8		69.9			67.5	
Mean-Low		**33.9/53.5**	**52.9**	**56.8**	**54.8**	**51.6**	**49.7**	**50.7**
Thomas A. Edison Charter School	Charter	1.0/87.6	52.5	67.1	58.5	51.1	64.4	59.7

[a] No middle school in the middle cluster scored 3 NCEs above the mean.

Table 6
High Schools Identified as "Beating the Odds"

School	District	W/L	9R	10R	9R	9M
Mean - High		**75.0/15.4**	**62.9**	**60.3**	**65.5**	**61.0**
Sussex Technical High School	Sussex Tech	78.6/18.5	72.0	65.0	70.3	63.9
Mean-Mid		**62.5/28.3**	**57.1**	**57.9**	**59.2**	**56.4**
St. Georges Technical High School	NCCVT	61.5/21.4	67.0		66.7	
Mean - Low		**42.2/38.8**	**53.0**	**53.5**	**56.5**	**52.1**
Howard High School of Technology	NCCVT	30.2/42.8	60.0	59.0	59.0	56.2

Table 5 indicates that only two middle schools scored 3 NCEs above their respective cluster means. Sussex Academy of Arts and Sciences outscored the means in the high-SES cluster and Thomas A. Edison Charter School in the low-SES cluster. No schools met the criteria in the middle-SES cluster. These were the only two charters to outperform expectations across all three school levels.

Three high schools exceeded expectations (see Table 6). One school outperformed in each of the three SES clusters, Sussex Technical High School in the high-SES cluster, St. Georges Technical High School in the middle-SES cluster, and Howard High School of Technology in the low-SES cluster. All three of these schools are from vocational-technical school districts.

None of the Delaware districts had schools identified as "beating the odds" at all three school levels. Several districts had multiple schools within a level, including Christina (elementary), Indian River (elementary), and NCCVT (high school). Indian River and

NCCVT also had schools in different clusters within a single school level that outperformed expectations.

Stability of Clusters and Identified Schools

As noted in the beginning of the report, the stability of the clusters and sample of identified schools was of great interest to both the researcher and the Delaware State Board of Education which funded this study. We were particularly interested in determining whether the clusters remained relatively stable from one year to the next, and whether the same schools were identified as "beating the odds" from one year to the next. To address the former, we looked at the absolute number and proportion of schools included in each cluster for the past two years, 2006 and 2007. We also compared the demographic characteristics of the schools (i.e., percent of white students, percent of students from low-income families) included in the cluster analyses at all three levels (i.e., elementary, middle, and high school) for both years to see if the clusters remained fairly stable. To respond to the latter, we compared the schools identified each year to see whether they matched. The results of these analyses are reported below.

Table 7 presents the number of schools included in the cluster analyses for each school level. The total number of elementary schools included in the sample increased by almost 25 percent (from 97 to 127) while the total number of schools in the middle and high school clusters differed by only one or two schools (respectively 41 to 43 and 33 to 34). The increase in the former was most likely due to the availability of data from many more schools on the state database, especially those with relatively small numbers of students in early elementary grades and from low-income families.

Table 7
Numbers of Schools Identified Each Year

School Level	2006		2007	
	Number	Percent	Number	Percent
Elementary	31	32.0	46	36.2
High SES	41	42.3	52	40.9
Middle SES	25	25.8	29	22.8
Low SES				
Middle	13	31.7	7	16.3
High SES	23	56.1	19	44.2
Middle SES	5	12.2	17	39.5
Low SES				
High	9	27.3	10	29.4
High SES	16	48.5	14	41.2
Middle SES	8	24.2	10	29.4
Low SES				

Although the distribution of schools varied from year to year for each school level, χ^2 statistical analyses (Siegel, 1956) indicated that these differences were not significant for either the elementary or the high school levels. The middle school clusters did change significantly ($\chi^2 = 8.68$, df = 2, $p<.05$). In examining Table 7, it is readily apparent that substantially fewer middle schools were included in the high-SES cluster and more middle schools in the low-SES cluster in 2007 compared to 2006.

The analyses next examined the differences in the means for the two school years, comparing the percentage of white students as well as the percentage of students from low-income families. Because schools did not always remain in the same cluster from one year to the next, these analyses were conducted at the aggregate school level rather than by individual SES cluster. By analyzing the data at the school level, we can determine if the percentages of white students or students from low-income families changed significantly across the entire sample. t-tests for paired samples (SPSS, 2006) were calculated to determine if significant differences existed between the two years of data by school level. These analyses are summarized in Table 8 below.

Table 8
Comparisons of Mean Percent of White Students and Students from Low-Income Families in 2006 and 2007

School Level/ Cluster	Comparison of Percent of White Students				Comparison of Percent of Students from Low-Income Families			
	2006 Mean	2007 Mean	t-test	Sig	2006 Mean	2007 Mean	t-test	Sig
Elementary	51.6	43.6	-1.273	.206	45.4	43.6	-2.793	.006
Middle	56.8	56.0	-2.178	.036	40.0	38.6	-1.537	.133
High	62.1	59.7	-3.612	.001	29.4	28.9	-.426	.673

The pattern of changes was not consistent across the three school levels. The percentage of white students did not change significantly at the elementary level, but did for the middle and high school levels. The percentage of white students decreased slightly at the middle school level and decreased almost three times as much at the high school level. The percentage of students from low-income families did not change significantly at the middle school and high school levels, but did decrease significantly at the elementary school level. Determining the factors that contributed to these changes in the samples is beyond the scope of this study.

The third set of analyses examined the clusters' ranges for the two annual sets of data. In particular, we looked at the differences in the ranges between the 2006 vs. 2007 percentage of white students as well as the 2006 vs. 2007 percentage of low-income students in each SES cluster by school level. Table 9 summarizes these data, including both the range and mean for each cluster for each school level.

Table 9
Percent of White and Low-Income Students at Each Grade Level by School Year

School Level/ Cluster	2006 White Percent		2007 White Percent		2006 Low-Income Percent		2007 Low-Income Percent	
	Range	Mean	Range	Mean	Range	Mean	Range	Mean
Elementary								
High	61.4-90.4	74.8	58.7-87.6	72.2	2.9-39.4	22.8	0-48.8	23.9
Middle	31.8-75.7	52.8	14.0-70.9	49.7	25.3-66.3	48.2	25.0-62.4	44.3
Low	0-35.5	19.4	0-35.1	19.5	51.5-84.0	65.1	50.0-87.6	67.9
Middle								
High	63.6-88.5	73.7	67.5-88.2	78.6	5.7-29.8	19.6	5.5-20.5	13.7
Middle	31.9-78.5	53.6	55.8-82.0	67.0	33.3-59.0	46.2	18.5-49.4	32.7
Low	0.4-29.4	9.7	1.0-54.6	33.9	69.6-84.0	75.9	33.8-87.6	53.5
High								
High	64.8-81.5	74.3	66.8-83.8	75.0	0-26.8	14.8	2.7-26.7	15.4
Middle	56.2-80.0	66.3	52.8-74.5	62.5	22.9-47.3	33.4	20.9-50.1	28.3
Low	35.2-50.1	41.9	30.2-56.4	42.2	36.2-41.0	39.1	31.0-43.6	38.8

This table organizes the data into four major groups. The second and third major columns report the 2006 and 2007 data for white students. The fourth and fifth columns summarize the 2006 and 2007 data for students from low-income families. Each row represents a different cluster within a school level. For example, the elementary high-SES cluster's percentage of white students ranged from 61.4 - 90.4 percent in 2006 and 58.7 - 87.6 percent in 2007; these ranges are very close from one year to the next. The mean percentages for this cluster for the two years also are very close, 74.8 and 72.2. This pattern suggests that significant differences did not exist in the demographic composition of the elementary high-SES cluster from one year to the next.

Of the 18 comparisons, 13 (72.2 percent) had differences in ranges less than 10 percent; the remaining five had much larger differences (shaded in yellow). One of the five clusters with large differences (i.e., greater than 10 percentage points) was the elementary middle-SES white cluster. Although the range expanded by almost 13 percentage points, the two means were fairly close. This suggests that the elementary cluster grew in size, but not in central tendency. The other four clusters with large differences were from the middle schools, both in terms of the percentage of white students and the percentage of students from low-income families in the middle- and low-SES clusters. In contrast to the elementary school cluster, the two sets of means differed substantially. Although the number of middle schools increased by only two, the distribution and central tendency of these middle school clusters changed markedly.

In order to answer the second question (i.e., Are the same schools identified from one year to the next?), the last set of analyses compared the two sets of schools to determine which schools were identified both years versus only one year (see Table 10).

Table 10
Distribution of Schools Identified as "Beating the Odds" in 2006 and 2007

School Level	Identified Both Years		Identified Only in One Year	
	Number	Percent	Number	Percent
Elementary	7	31.8	15	68.2
Middle	1	14.2	6	85.8
High	2	25.0	6	75.0

Schools were not consistently identified as "beating the odds" from one year to the next. Seven elementary schools were identified both years (31.8 percent), one middle school (14.2 percent), and two high schools (25.0 percent). This fluctuation suggests that the identification process is not as strong as it needs to be. Schools that are identified as "beating the odds" should maintain high levels of performance from one year to the next.

When all of the above analyses are considered, the stability of the clusters and sample of identified schools analyses received mixed support (see Table 11).

Table 11
Stability of Clusters and Identified Schools

School Level	Cluster Stability			Identification of Schools
	Absolute Number/ Proportion	Comparison of Means	Comparison of Ranges	
Elementary	Number increased, proportions did not differ significantly across clusters	No significant change in white percent means, significant change in low-income percent means	Middle cluster white percent range increased; no other differences	31.8 % identified both years, 68.2 % not identified both years
Middle	Minimal change in number, significant change in distribution across clusters, particularly for low-SES cluster	Significant change in white percent means, no significant change in low-income percent means	Middle and low cluster, percent of white and low-income ranges changed markedly	14.2 % identified both years, 85.8 % not identified both years
High	Minimal change in numbers and in proportions across clusters	Significant change in white percent means, no significant change in low-income percent means	No significant changes	25.0 % identified both years, 75.0 % not identified both years

The elementary and high school clusters exhibited the most stability of the three clusters from one year to the next. In terms of the elementary clusters, this is most likely due to its

overall size. It is not clear why the high school clusters were so much more stable than the middle school clusters, given their relatively small numbers. The factors that contributed to the lack of stability in the middle school sample are beyond the scope of this study.

The inconsistent identification of "beating the odds" schools from one year to the next was disappointing. In a few cases, schools that were identified in one year missed being identified in the second year by low performance in a single subject and grade.

Analyzing multiple years of data to define and establish the school clusters will most likely increase the reliability of the clusters from one year to the next as well as the identification process. In terms of the former, adding more data points will certainly help stabilize the middle and high school clusters given their relatively small sample sizes. In addition, requiring schools to be identified over multiple years should increase both the validity and reliability of the identification process.

Overall, the findings suggest that the basic analysis scheme is sound. Student achievement increases from the low- to the high-SES cluster in the majority of school levels. Additional years of data should be included in establishing membership in each cluster; by increasing the data points, the influence of relatively small sample sizes and year-to-year fluctuations in each of the clusters will be reduced. Once this change is made, the three clusters at each school level will likely stabilize. In addition, schools that are consistently identified as "beating the odds" across multiple years will be more worthy of study to determine the specific strategies that produce high records of achievement.

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Author Note

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Appendix A

Cluster Analyses

Figure 1
Elementary School Cluster

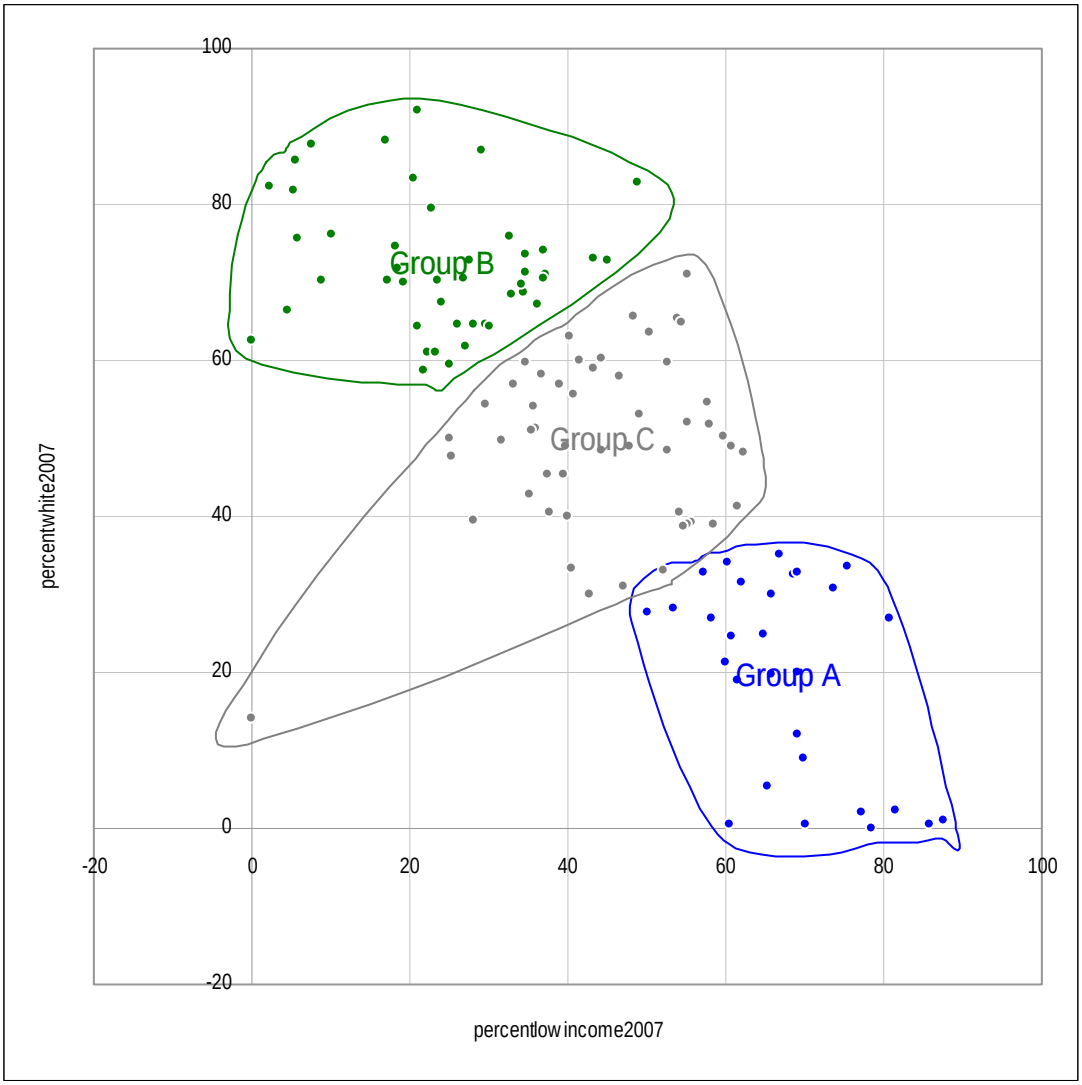


Figure 2
Middle School Cluster

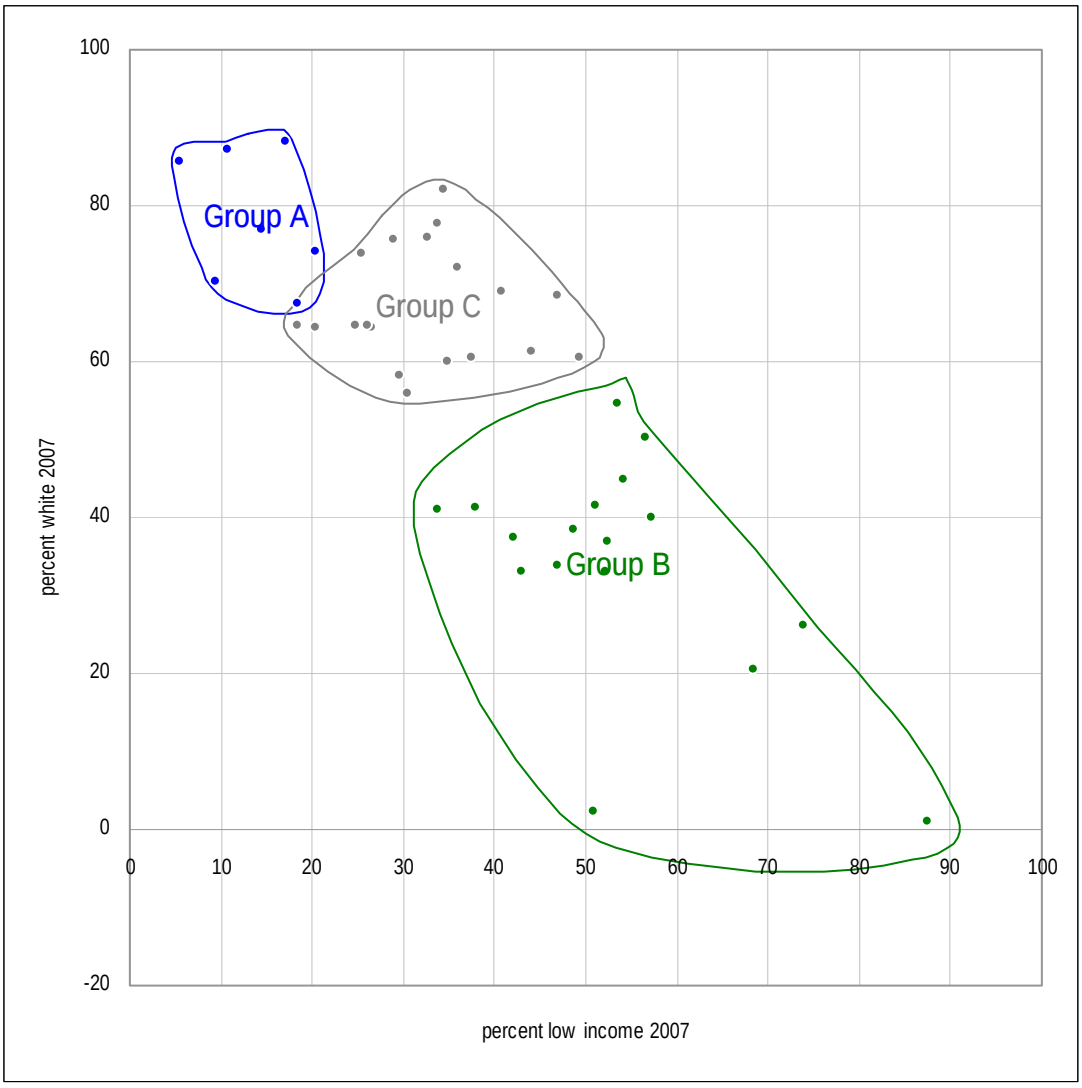
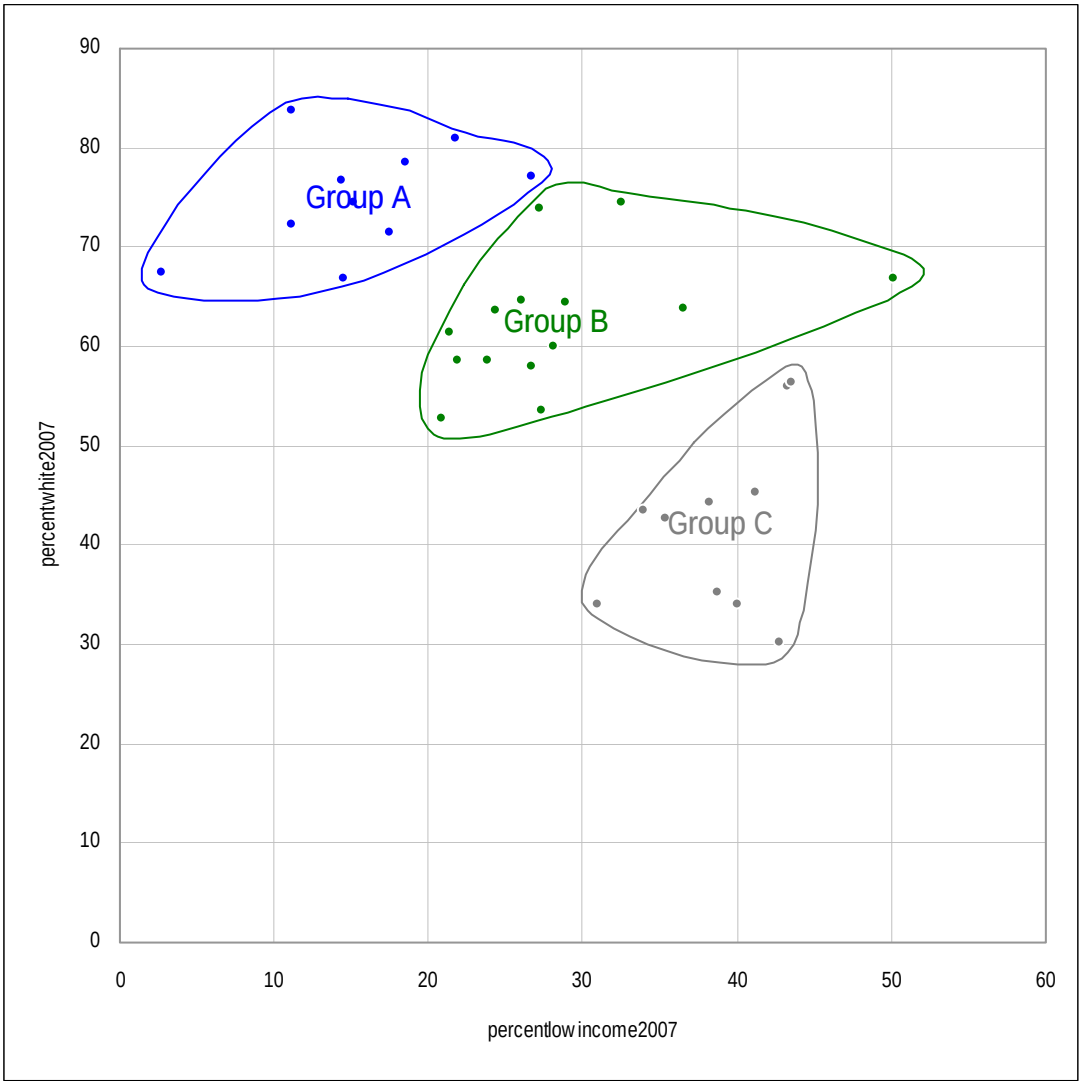


Figure 3
High School Cluster



Appendix B

School Levels and Clusters

Elementary Schools

District	High	Middle	Low
Appoquinimink	Appoquinimink ELC	Silver Lake	
	Brick Mill		
	Cedar Lane		
	Cedar Lane ELC		
	Olive B. Loss		
	Townsend		
Brandywine	Brandywood	Carrcroft	Darley Road
	Charles W. Bush	Claymont	
	Forwood	David W. Harlan	
		Lancashire	
		Lombardy	
		Maple Lane	
		Mount Pleasant	
		Pierre S. duPont	
Caesar Rodney	Major George S. Welch	Allen Frear	Kent County ILC
	Star Hill	John S. Charlton	
	W. B. Simpson	Nellie Hughes Stokes	
		W. Reily Brown	
Cape Henlopen	Milton	H. O. Brittingham	
	Rehoboth		
	Richard A. Shields		
	Sussex Consortium		
Capital	Hartly	Fairview	Central
		Kent County Community School	East Dover
		North Dover	South Dover
			Towne Point
			Booker T. Washington
Christina	The Brennan School	Albert H. Jones	Bancroft
	Jennie E. Smith	Brookside	Bayard
	John R. Downes	Casmir Pulaski	Elbert-Palmer
	R. Elisabeth Maclary	Etta J. Wilson	Frederick Douglass Stubbs
	West Park Place	Henry M. Brader	
		Joseph M. McVey	
		Margaret S. Sterck School for the Deaf	

		May B. Leasure	
		Robert S. Gallaher	
		Thurgood Marshall	
		William B. Keene	
Colonial	Southern	Castle Hills	Calvin R. McCullough
		Carrie Downie	Colwyck
		John G. Leach	Harry O. Eisenberg
		Pleasantville	
		Wilmington Manor	
Delmar			
Indian River	Lord Baltimore	East Millsboro	Frankford
	Southern Delaware School of the Arts	Georgetown	N. Georgetown
		Howard T. Ennis	
		Long Neck	
		Phillip C. Showell	
Lake Forest	Lake Forest Central		
	Lake Forest East		
	Lake Forest North		
	Lake Forest South		
Laurel		Laurel Intermediate	
		North Laurel	
		Paul Dunbar	
Milford		Benjamin Banneker	
		Evelyn Morris ECC	
		Lulu M. Ross	
Red Clay	Brandywine Springs	Meadowood Program	Anna P. Mote
	Forest Oak	Richardson Park Learning Center	Austin D. Baltz
	Heritage		Evan G. Shortlidge
	Linden Hill		Highlands
	North Star		Marbrook
	Richey		Richardson Park
			Warner
			William C. Lewis Dual Language Magnet
Seaford		Blades	
		Douglass	
		Seaford Central	
		West Seaford	
Smyrna	Clayton	Frederick Douglass	

	N. Smyrna	Smyrna Kindergarten	
	Smyrna		
Woodbridge		Woodbridge	
Charters	Campus Community School	Family Foundations	Academy of Dover
	MOT Charter		East Side
	Newark Charter		
	Odyssey Charter		
	Providence Creek Academy		Kuumba Academy
	Sussex Consortium		Marion T. Academy
			Thomas A. Edison

Middle Schools

District	High	Middle	Low
Appoquinimink	Everett Meredith	Louis L. Redding	
Brandywine		Hanby	Talley
		Springer	
Caesar Rodney		Dover Air Force Base	
		F. Neil Postlethwait	
		Fred Fifer	
Cape Henlopen		Beacon	
		Mariner	
Capital			Central
			William Henry
Christina			Casmir Pulaski
			Gauger-Cobbs
			George V. Kirk
			Shue-Medill
Colonial			George Read
			Gunning-Bedford
			New Castle
Delmar		Delmar	
Indian River	Southern Delaware School of the Arts	Selbyville	
		Sussex Central	
Lake Forest		W. T. Chipman	
Laurel		Laurel Intermediate	
Milford		Milford	
Red Clay	Cab Calloway School of the Arts	Skyline	Alexis I. duPont
	H. B. duPont		Conrad
			Stanton
Seaford			Seaford
Smyrna	Smyrna	John Bassett Moore	
Woodbridge			Phyllis Wheatley
Charters	MOT Charter	Campus Community School	Maurice J. Moyer Academy
	Sussex Academy of Arts and Sciences	Positive Outcomes	Thomas A. Edison
		Providence Creek Academy	

High Schools

District	High	Middle	Low
Appoquinimink	Middletown		
Brandywine		Brandywine	Mount Pleasant
		Concord	
Caesar Rodney		Caesar Rodney	
Cape Henlopen		Cape Henlopen	
Capitol			Dover
Christina		Newark	Christiana
			Glasgow
Colonial			William Penn
Delmar	Delmar		
Indian River	Indian River	Sussex Central	
Lake Forest		Lake Forest	
Laurel		Laurel	
Milford		Milford	
New Castle County Vocational-Technical	Paul M. Hodgson Vocational Technical	Delcastle Technical	Howard High School of Technology
		St. Georges Technical	
Polytech	Polytech		
Red Clay	Cab Calloway School of the Arts	Alexis I duPont	Dickinson
			McKean
Seaford			Seaford
Smyrna	Smyrna		
Sussex Tech	Sussex Technical		
Woodbridge			Woodbridge
Charter	Charter School of Wilmington	Campus Community School	
	Delaware Military Academy	Pencader Business and Finance Charter	

Appendix C

Schools Identified as "Beating the Odds" in 2006 and 2007

Table
Schools Identified as Beating the Odds in 2006 and 2007

School Level	School	Identified in 2006	Identified in 2007
Elementary	Benjamin Banneker		x
	Blades	x	
	Booker T. Washington	x	
	Clayton		x
	East Dover	x	
	East Millsboro	x	x
	Forest Oak	x	
	Frankford	x	x
	Georgetown		x
	Henry Brader		x
	Lewis Dual Language	x	
	Long Neck	x	x
	Lord Baltimore	x	x
	Marbrook		x
	McVey	x	
	North Georgetown		x
	Robert Gallaher	x	x
	Seaford Central	x	
	Simpson	x	
	South Dover	x	x
	Thurgood Marshall	x	x
	Towne Point	x	
Middle	Delmar Middle	x	
	Dover AFB	x	
	Fifer	x	
	Selbyville	x	
	Sussex Academy for the Arts and Sciences	x	x
	Sussex Central Middle	x	
	Thomas A. Edison Charter		x
High	Cab Calloway School for the Arts	x	
	Caesar Rodney	x	
	Cape Henlopen	x	
	Delmar	x	
	Howard High School of Technology	x	x
	Indian River	x	
	St. Georges Technical		x
	Sussex Technical	x	x