

THE ACHIEVEMENT GAP PRODUCTION PROCESS BETWEEN BLACK AND WHITE STUDENTS IN CHICAGO

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ABSTRACT

In this study, a widely discussed issue, the achievement gap is examined in the light of ISAT scores gathered from the Chicago metro area schools. Achievement gap is further reconsidered by using the term 'gap production processes'. Tables and figures showing reading and math scores for both white and African-American 5th graders present several manifestations of the 'gap production process' in 10 districts in the Chicago metro area. A mixture of sample schools has been selected by taking into account the ethnic composition of any given school to ensure representativeness. As a result, it is found that depending on schools' location, 'gap production process' manifests itself in ways that vary from one district to another.

Key Words: Achievement Gap, Gap Production Process, Equity Issue.

ÖZET

Bu çalışmada sıklıkla tartışılan bir sorun olan "başarı farkı" Chicago şehrine ait ISAT. (Illinois Standardized Achievement Test) puanlarının ışığında incelenmiştir. "Başarı farkı" bundan başka "başarı farkı oluşum süreci" terimi kullanılarak yeniden gözden geçirilmiştir. Tablolar ve figürlerde gösterilen Chicago'daki 10 okul bölgesindeki 5. sınıf beyaz ve Afrika kökenli Amerika öğrencilerin Matematik ve Okuma testi puanları "başarı farkı oluşum sürecinin" farklı ortaya çıkış şekillerini göstermektedir. Örnekleme dahil edilecek okullar, temsil ediciliği garanti altına almak amacıyla sözkonusu okulların her birinin etnik bileşimi dikkate alınarak seçilmiştir. Sonuç olarak, "başarı farkı oluşum süreci" okulun bulunduğu bölgeye bağlı olarak değişime göstermiştir.

Anahtar Sözcükler: Başarı Farkı, Başarı Farkı Oluşum Süreci, Eşitlik Sorunu.

HOW IS THIS STUDY AN EVALUATION STUDY?

Evaluation practice is aimed, as Eisner (1991) following Dewey suggests, at the reeducation of perception. The critic, according to Eisner, describes, interprets, evaluates, and points to enduring qualities or aspects of a phenomenon so that readers can see it.

Schwandt (2002)

Evaluation may be used for many purposes: evaluating organizations, institutions, policies, strategies, services, and performance. Evaluation might also be undertaken to help make a decision about implementing a program or policy, to find out reasons for success and failure, and to improve or change program or policy. Patton (1988) describes evaluation with a definition that is flexible and wide:

The practice of evaluation involves the systematic collection of information about the activities, characteristics, and outcomes of programs, personnel, and products for use by specific people to reduce uncertainties, improve effectiveness, and make decisions with regard to what those programs, personnel or products are doing and emphasizes a systematic collection of information about, a broad range of topics, for use by specific people, for a variety of purposes. (Patton, 1988, p. 301)

But, as Cronbach (1980) states, "program evaluation is a process by which society learns about itself." (p. 2) According to Cronbach (1980), illumination is one of the most important parts of evaluation. According to Cronbach, "Evaluation must be viewed as a way of illuminating complex mechanisms as treatment organizations vary, as the process as well as outcome is to be studied, and as information from a field of test is more likely to be used in decisions about actions other than the one tested." (p. 359) (Madaus et al., 1983)

"Illuminators are important in shaping policy because they frame and reassess broad issues. They are the ones most likely to spread a new social philosophy or to make large parts of the population aware of emerging values." (p. 103).

Stake (1975; 1983) explains that people have expectations from evaluation: to document events, to record student change, to place the blame for trouble, to aid administrative decision making, to facilitate corrective action, to increase our understanding of teaching and learning. Stake (2004) describes "responsive evaluation" as a "general perspective in the search for quality and the representation of quality in a program." Responsive evaluation is concerned with stakeholders' concerns. Such concerns are related directly or indirectly, to

the values of a program and may offer legitimate purpose for a particular evaluation study if the study responds to audience requirements for information (Madaus et al., 1983, p. 292; Abma, T. A . & Stake, R. 2001). Stake's this evaluation approach that stake holders know what they need to know (Russ-Eft & Preskill, 2001). Scriven (1986) contends that evaluation is about making judgments of a program quality and focusing consumer needs.

Here I offer a study about how the black/white achievement gap emerges. To make decision about equity and what the achievement gap-production process is, it is necessary to clarify what the situation is. This study aims to inform and illuminate perceptions of public and decision making about the equity gap.

The achievement gap between white and black students is an obvious concern for all educators. Ke's (2003) study lays the foundation for understanding of the process by which the achievement gap has been and is still being shaped. According to Ke (2003), it is white achievement that is at the heart of the gap production process in downstate Illinois school districts.

There is abundant evidence that suggests that an achievement gap occurs regardless of different contexts. Only the degree of this gap can vary from one context to another. In the context of Ke's (2003) study, I have looked at individual schools in ten school districts in the Chicago metro area and tried to understand how the achievement gap processes in these districts and schools are in line with the gap processes which Ke (2003) identified as downstate district pattern. From the viewpoint of evaluation, this packet of studies will focus on raising new questions and illumination of perceptions about the achievement gap. A situation cannot be called as a problem without information about what the situation is. In the light of all evaluation discussions, this study's goal is to focus on raising questions as a basis for making decisions aimed at enhancing equity issues.

INTRODUCTION

This study attempts to contextualize the black – white achievement gap-production process with a focus on the Chicago Metro Area. Ke's study (2003) of downstate Illinois districts found that there is a significant variation between scores of whites and less variation on the part of the black students. He concluded that, at the district level, since the cohorts of white students show much more variation, and the cohorts of black students almost invariably less, the gap between the achievement of black and white students is produced as an outcome of the performance of white students. His findings also suggest that

this production process is manifested across downstate districts in a uniform manner.

This study seeks to test whether Ke's (2003) findings can be extended into the Chicago metro area. Because of the difference between contexts, it is hypothesized that there will be different gap-production processes at work. The purpose of the study is to bring more clarity to the achievement gap issue.

BLACK-WHITE ACHIEVEMENT GAP IN DOWNSTATE ILLINOIS

Ke (2003) began his investigation with the finding that the black-white achievement gap in the Champaign school district was very large. He sought to contextualize that finding by placing it in the context of other (large) downstate districts – to ask what kind of a problem for Champaign the finding of a large gap indicated.

Ke framed his initial findings from the 10 schools in the Champaign district in the context of eight additional downstate districts – for a total of 105 schools (5th grade). We should note that Ke's concern was district-level achievement gaps between school-level cohorts of black and white students within the districts. His indicator of achievement was the percentage of students in each set of cohorts falling below standards on the ISAT tests.

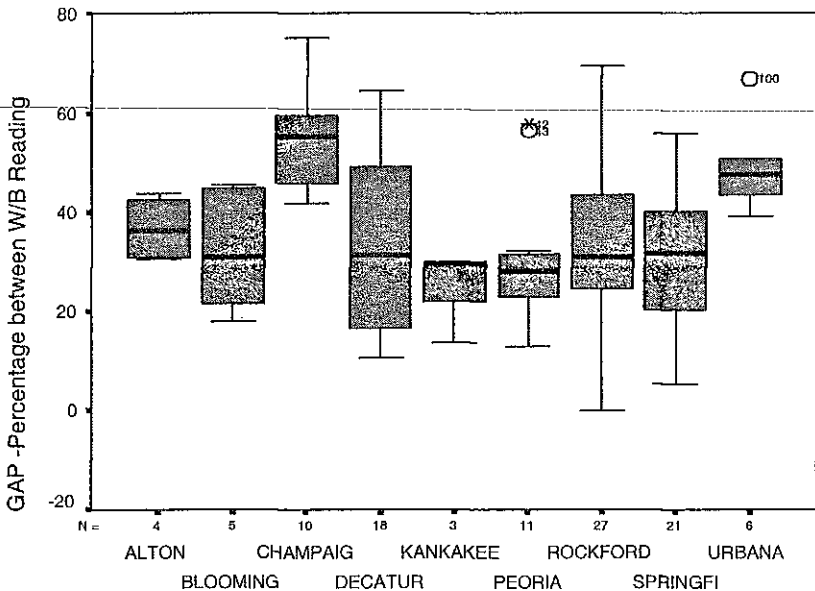


Figure 1: District white/black gap in ISAT reading achievement (Ke, 2003)

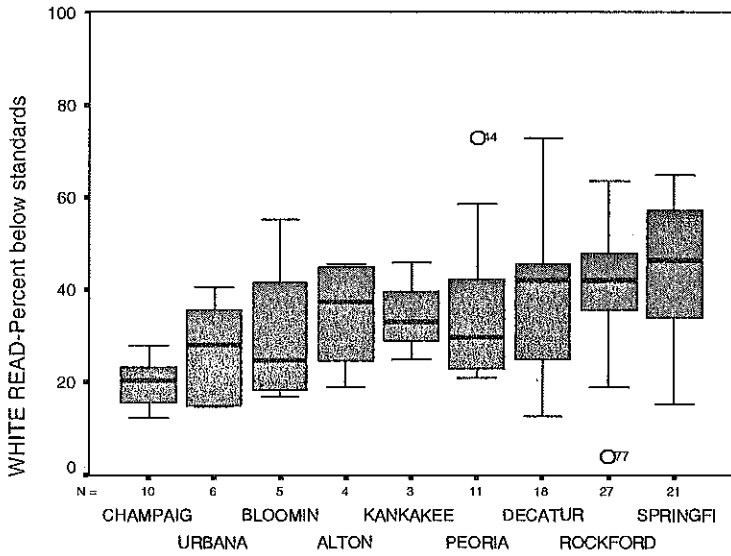


Figure 2: White Achievement in Reading, ISAT (Ke, 2003)

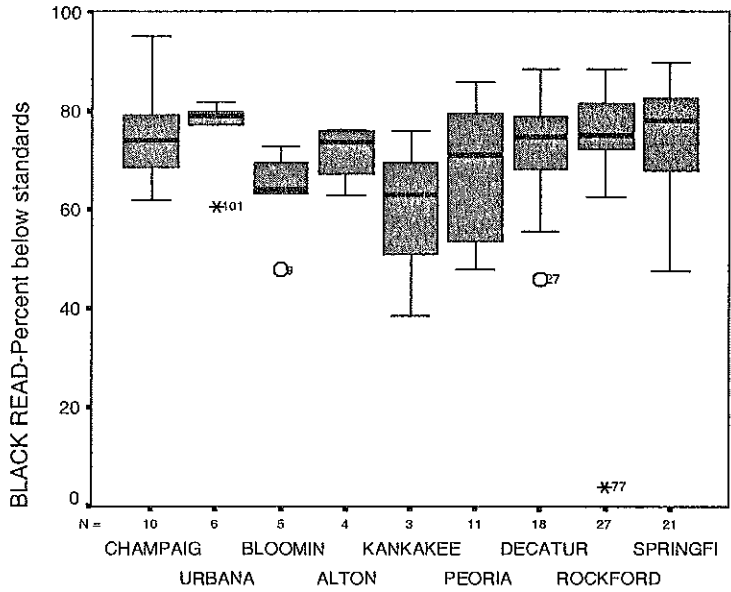


Figure 3: Black achievement in Reading, ISAT (Ke, 2003)

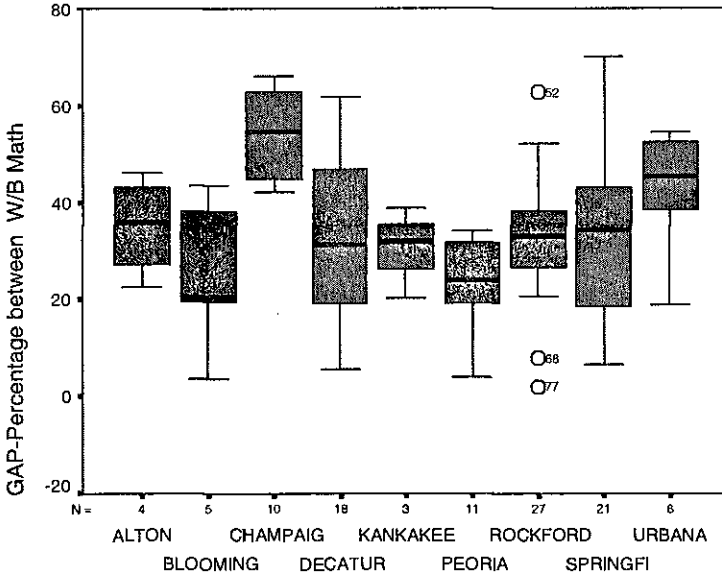


Figure 4: District white/black gap in tSAT math achievement (Ke, 2003)

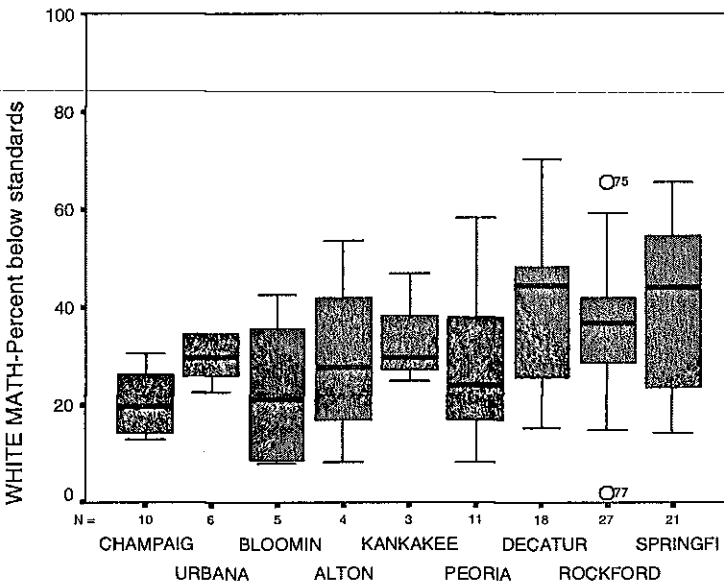


Figure 5: White achievement in Math, ISAT 2000-2002 (Ke, 2003)

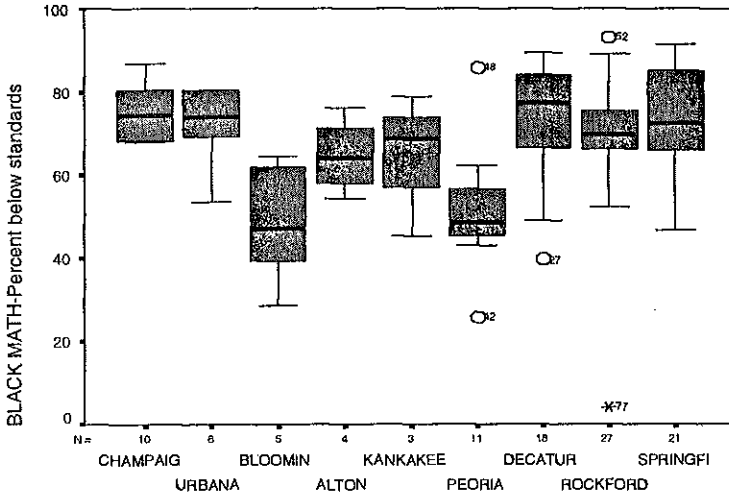


Figure 6: Black achievement in Math, ISAT 2000-2002 (Ke, 2003)

Figures 1 through 6 present Ke's (2003) core findings on the achievement gap, Figures (reading and math) for the districts he investigated show the gap in Champaign schools in the context of the nine districts. Ke found what he contended was a more or less consistent pattern across the nine downstate districts: considerable variation in white district-level mean achievement and a narrower range of (lower) achievement on the part of the black cohorts. In its turn this pattern was, he suggested, created by a wider range of SES among white cohorts and by a more uniform, lower SES on the part of the black cohorts.

This study starts from Ke's (2003) findings regarding the downstate gap-production and I apply his perspective to the six-county Chicago metro area. I explore educational achievement as measured by reading and math scores for 5th graders.

Methodology

The data set used in this study was the Illinois Report Card file for 2002 housed on the ISBE web site. The file includes data for 778 elementary schools in the six counties of the Chicago Metro area. I sought a population of schools containing meaningful numbers of both black and white students. The criteria

used for selecting schools for school-level analysis without taking into account districts are as follows:

1. The school included a grade 5 and had ISAT data available for white and black students.
2. Representativeness, that is, the school populations should include, at least, 10% black or white students.
3. Schools with \Rightarrow 85% in black or white group have been excluded. In other words, only schools with relatively large populations of both ethnic groups have been included to ensure representativeness.

The number of schools, i.e., 105 that met these criteria was very limited. Using a further district selection criterion of at least 4 schools per district, 10 districts and 72 schools were selected for study (see Table 1): Aurora W, Evanston, Indian Prairie, Joliet, Oak Park, Schaumburg, School District 46, Valley View, Waukegan, and Zion Elementary School District.

Table 1: Selection process of schools

Districts	NUMBER OF SCHOOLS	DISTRICT-WHITE %	DISTRICT-BLACK %	RANGE OF SCHOOL-LEVEL LOW INCOM %	SCHOOLS WITH NO TEST SCORE DATA
Evanston	12	42.40	43.80	25.80-56.70	-----
Oak Park	8	57.50	30.20	1.20-23.20	-----
Joliet	11	25.40	39.20	16.50-70.00	1
Schaumburg	5	65.10	7.00	5.40-18.10	1
Aurora	8	46.20	19.40	15.60-51.50	-----
Valley View	8	52.70	25.00	9.40-47.30	-----
School District 46	8	53.30	7.10	18.80-68.00	-----
Indian Prairie	5	77.50	7.00	2.80-6.20	-----
Waukegan	4	11.90	23.10	31.60-54.80	-----
Zion Elementary	5	29.20	48.60	51.20-65.30	-----
TOTAL	74	-----	-----		2

Study

Study sought to explore the between-district and within-district gap-production process in 5th grade reading and math in 72 schools in 10 districts in the Chicago metro area. The mechanisms creating the gaps in academic

achievement between African-American and white students are the main issue of the study. The focus is to supplement Ke's (2003) analysis on downstate districts. Study will address the following two questions:

- How are black and white student achievement gap patterns being produced across districts located in the Chicago metro area?
- How are black and white student achievement gap patterns being produced across schools within districts located in the Chicago metro area?

District Level Gap Production Process in Reading

The goal in this section is to develop an understanding of the processes by which district-level achievement gaps in reading are produced across the 10 districts. In this exploration of district-level findings, the unit of analysis is the district-level cohorts of black and white students across the 10 districts, i.e., the discussion addresses the clusters of black and white cohorts within each district and the cohorts are not linked at the school level. However, in the case of the analysis of reading achievement, outliers in one district (Indian Prairie) complicate a task of determining district-level patterns. To address this issue, all outliers were removed from the data set, which had the effect of eliminating Indian Prairie from the analysis.

Table 2: Reading: Mean scores in percentage and SDs of black and white cohorts.

	Gap	White Reading Mean % below standards	White Reading SD	Black Reading Mean % below standards	Black Reading SD
Evanston	41.7	7.6	5.1	49.3	15.3
Oak Park	32.8	14.1	13.2	46.9	12.5
Valley View	23.5	22.0	7.1	45.5	16.6
Schaumburg	27.3	30.5	8.1	57.8	20.5
Joliet	22.3	33.9	13.8	56.2	23.9
Aurora	23.0	35.8	10.9	58.8	18.0
Waukegan	25.6	37.1	19.9	62.7	12.6
SD#46	32.7	39.2	17.4	71.9	12.1
Zion	16.7	42.5	20.1	59.2	11.6
Range of Districts Means		34.9		26.4	

Table 3: Reading: Mean scores in percentage and SDs of black and white cohorts. (without SD#46)

	Gap	White Reading Mean % below standards	White Reading SD	Black Reading Mean % below standards	Black Reading SD
Evanston	41.7	7.6	5.1	49.3	15.3
Oak Park	32.8	14.1	13.2	46.9	12.5
Valley View	23.5	22.0	7.1	45.5	16.6
Schaumburg	27.3	30.5	8.1	57.8	20.5
Joliet	22.3	33.9	13.8	56.2	23.9
Aurora	23.0	35.8	10.9	58.8	18.0
Waukegan	25.6	37.1	19.9	62.7	12.6
Zion	16.7	42.5	20.1	59.2	11.6
Range of Districts Means		34.9		17.2	

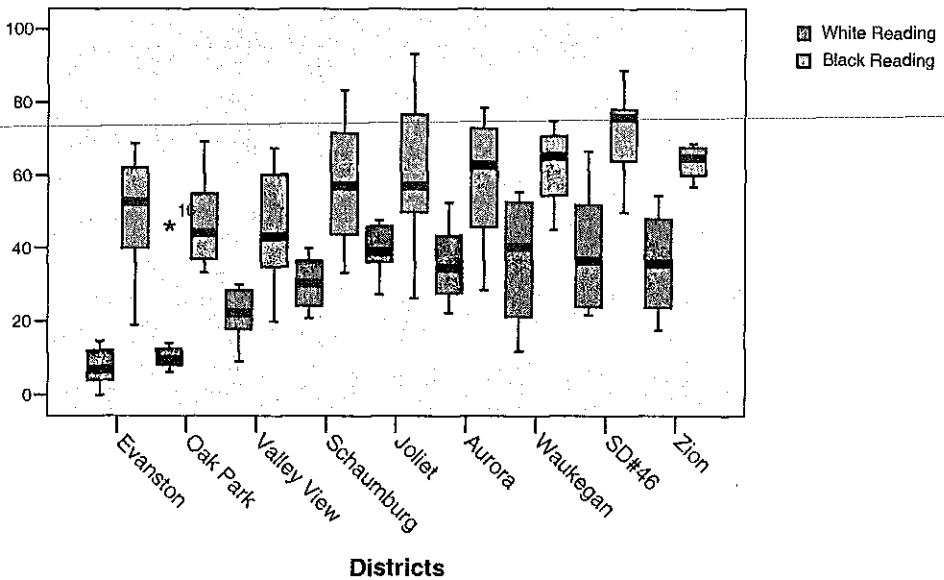


Figure 8: Mean Percentages of Reading Scores in nine districts (below standards).

Figure 8 presents the reading scores as a box plot, with the 9 districts ordered by the mean percent of white students falling below standards in reading. Table 2 presents the gap, mean scores, and SDs, for both white and black students falling below standards. The gap between black and white performance in reading is quite clear from an inspection of Table 2 and Figure 8, ranging from a 42 point difference in the percentage of students not meeting the state's standards in reading in Evanston to a 17 point difference in Zion, which has the highest percentage of students (42.5) in the white cohorts not meeting the state's standards. I also see that, parallel to Ke's (2003) findings for downstate districts, the largest gaps occur in the districts in which white students are relatively high-achieving, i.e., Evanston, Oak Park, and Valley View. Furthermore, as Table 2 and 3 shows the overall range of black means (26.4) is narrower than that of the white means (34.9); if I exclude SD# 46, which is anomalous in terms of the achievement of black cohorts, the range of black means is (17.2). This difference seems large enough to support the conclusion that I see an overall gap-production process across this set of Chicago-area districts that parallels Ke's understanding of the downstate process, i.e., it is white rather than black achievement that 'creates' the pattern of achievement gaps across these districts.

An examination of scatterplots and correlations supports this conclusion. As seen in Figure 7a and Table 4, across all 9 districts white reading scores have a clear linear relationship with reading gaps ($r = -.89$); the pattern for black reading achievement is mixed ($r = -.16$). When SD#46, as an outlier, is removed from the pattern, the picture changes somewhat: the relationship between both white black reading achievement and district-level gaps strengthens (white: $r = -.89$; black: $r = -.51$). It seems clear that, overall, white achievement in reading makes the major contribution to the gap-production process across eight of these nine districts. However, an inspection of Figure 7b might suggest that there are two processes playing on the relationship between black achievement and gap-production: across Evanston, Oak Park, and Valley View there would seem to be a clear association between black achievement, albeit the range is narrow, and gaps whereas in the remaining districts, black achievement seems to play little role in the gap-production process.

Table 4: White, Black, and gap reading correlations without SD#46

	gap	White reading	Black reading
gap	1	-.891(**)	-.506
White reading		1	
Black reading	-.506	.842(**)	1

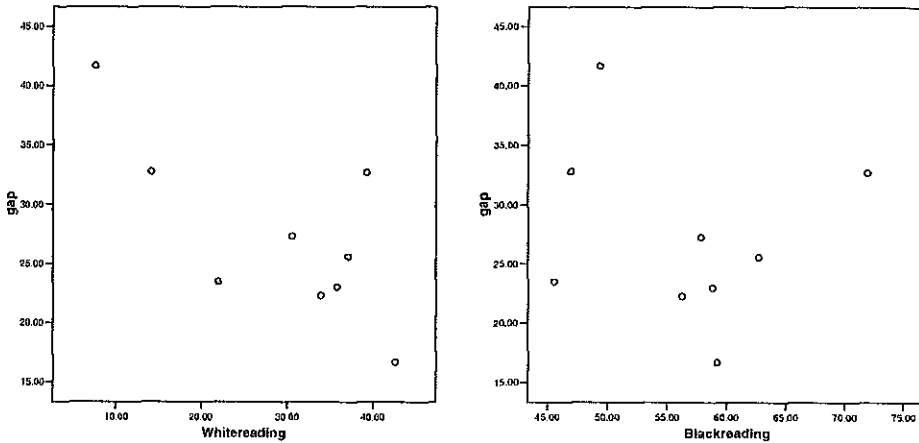


Figure 7a-b: White and Black reading-Reading gap across eight districts.

District Level Gap Production Process in Math

Table 5 and Figure 9 present the district-level math achievement gaps in the percentage of students falling below standards on the ISAT math test and the means, SDs and for the white and black cohorts within each district.

Table 5 presents the achievement gaps in the percentages and the mean percents of the black and white (district-level) cohorts within the 10 districts falling below the standard in math; the districts are ordered by the mean percent of the white cohort falling below standards. An inspection of Table 5 indicates that the largest gap in math achievement is found in Evanston (35.1). On the other hand, the smallest gap is seen in Waukegan (14.1). The highest percentage of white students (37.1) not meeting the state's standards' in math is found in School District 46 which also has the highest percentage of black students not meeting the standards (64.0).

Table 5: Math: Mean scores percentage and SD, white and black cohorts in 10 districts.

	Gap	White Math Means % below Standards	White Math SD	Black Math Means % below Standards	Black Math SD
Evanston	35.1	6.1	5.8	41.2	14.2
Oak Park	27.1	10.1	9.0	37.2	12.3
Valley View	19.9	13.0	5.9	32.9	12.1
Indian Prairie	20.2	15.9	4.5	36.1	11.2
Schaumburg	24.6	20.1	5.9	44.7	28.3
Waukegan	14.1	20.2	8.7	34.4	9.8
Aurora	28.3	20.9	9.5	49.3	18.1
Joliet	19.6	27.4	12.6	47.1	16.2
Zion	20.4	29.9	12.1	50.4	9.3
SD#46	26.9	37.1	13.8	64.0	10.5
Range of Districts Means		31.0		31.1	

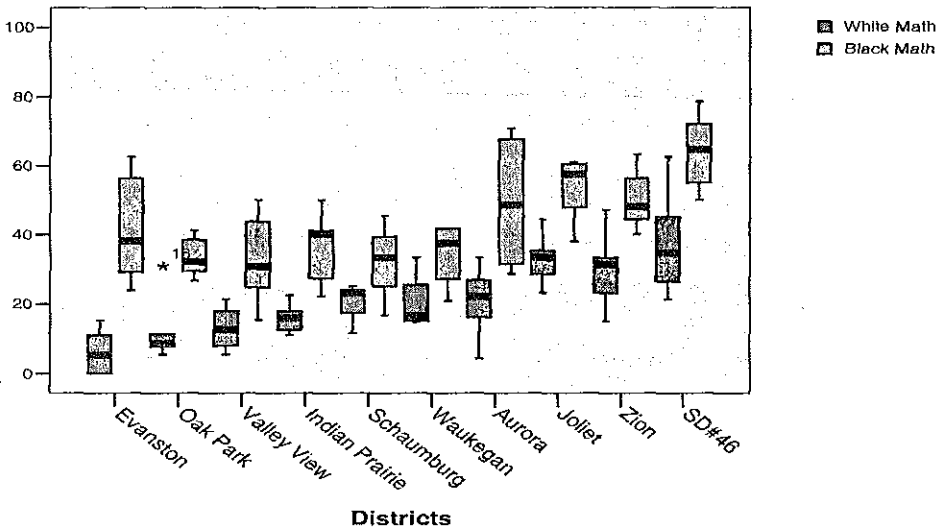


Figure 9: Mean Percentages of Math Scores in 10 districts (below standard)

Table 6: All districts correlations for math

		White math	Black math	gap
White math	Pearson Correlation	1	.803(**)	-.310
	N	10	10	10
Black math	Pearson Correlation	.803(**)	1	.318
	N	10	10	10
gap	Pearson Correlation	-.310	.318	1
	N	10	10	10

An inspection of Table 5 suggests that there are two gap production processes to be seen in math across the 10 districts. Mean scores in the table show that there is a break point between districts, so it can be observed two different gap production processes in math. Table 5 shows these two different gap production processes across ten districts. The break point can also be seen in Figure 9 clearly. First pattern includes Evanston, Oak Park, Valley View Indian Prairie, Schaumburg, Waukegan, Aurora. Second pattern is Joliet, Zion and SD #46.

Although some districts such as Schaumburg show different SD number for instance, the black students' cohorts in Schaumburg have relatively same means (44.7 percent below standard) SD number is quite anomalous (28.3). White students' achievement scores in two districts namely in Evanston and Oak Park, are uniform because when looking at these two districts, one can observe that Evanston and Oak Park reflected homogenous representation of achievement in terms of school level. Table 7 also shows the correlation between district level gap math scores for black and white students across ten districts. The correlations and scatter plots for first pattern seem to indicate that it is the both white cohorts and black cohorts that determine the gap.

Black ($r = .60$), White ($r = -.56$).

Table 7: White, Black, and gap math correlation for first pattern

	gap	White math	Black math
gap	1	-.562	.608
White math	-.562	1	.315
Black math	.608	.315	1

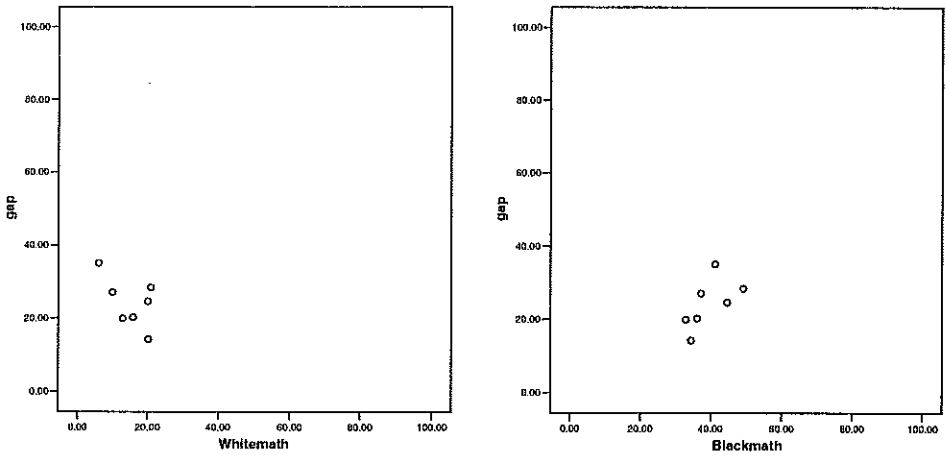


Figure 10 a-b: White and Black Math-Math gap across seven districts. (First pattern)

Table 8: White, Black, and gap math correlation for second pattern

	gap	White math	Black math
gap	1	.989	.996
White math	.989	1	.998(*)
Black math	.996	.998(*)	1

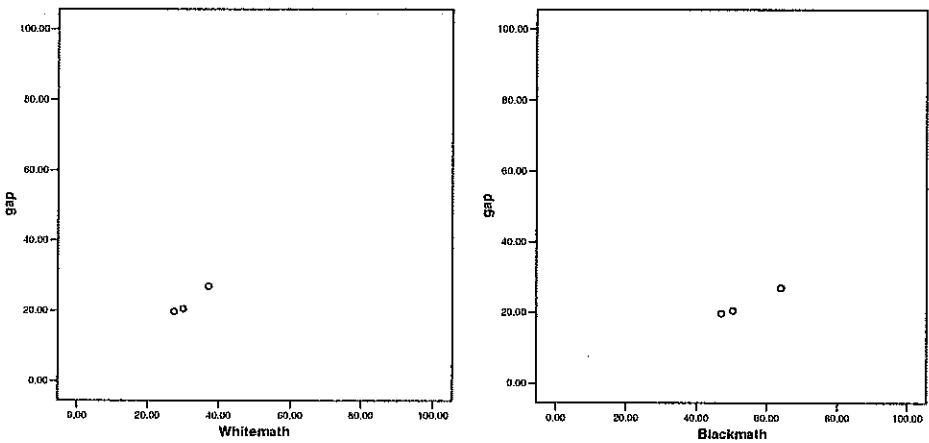


Figure 11 a-b: White and Black Math-Math gap across three districts. (second pattern)

An inspection of Table 8 and Figure 11a-b, correlation numbers and scatter plots for second pattern seems to indicate that it is the both white cohorts and black cohorts determines the gap.

To sum up, as far as the math achievement is concerned, when looking at range of means, the achievement gap produced by both black cohorts and white cohorts in math.

In summary, for district level analysis, it can be observed there is one pattern in reading and white cohorts create the achievement gap in the light of the figures and tables. This is also parallel Ke's findings for downstate achievement gap production process. On the other hand, there are two different gap production processes in math and both white and black cohorts determine the gap.

Reading – School Level Analysis

The goal of this second analysis is to describe focus on how each district's gap production process plays out at the school level.

It is concluded from the district-level analysis of reading achievement that there was a single process of gap-production across eight of the nine districts: gaps were produced largely by district patterns of white reading achievement with black achievement playing a less important role. In that analysis, the unit of analysis was the cohorts of white and black classes within the districts, i.e., the cohorts were not linked at the school level. I now turn to an analysis of within district, school-level gap-production in six of the districts: Evanston (12 schools), Valley View (8 schools), Oak Park (8 schools), School District #46 (8 schools), Joliet (10 schools) and Aurora (8 schools) (See Appendix).

Figures 12 a-b through 17a-b present scatter plots for comparing the achievement of white and black school-level cohorts with the achievement gap for the schools. As indicated above, all the districts were classified as one pattern for the district level analysis.

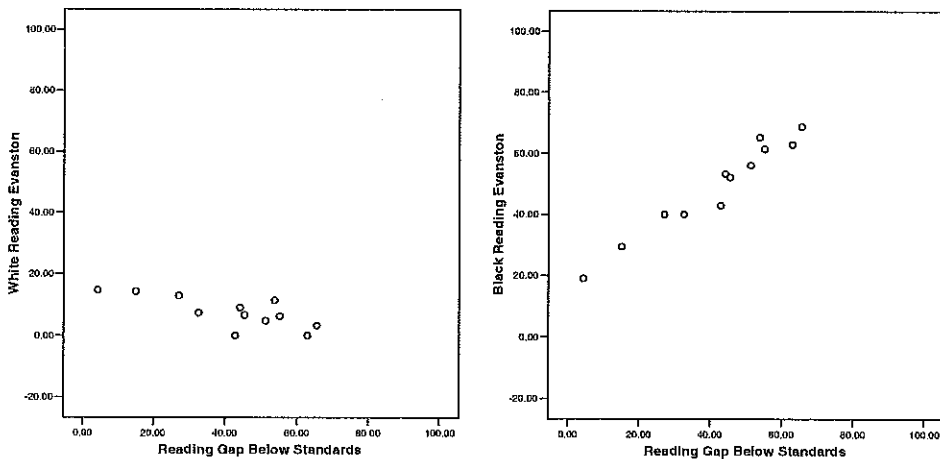


Figure 12a-b: White and Black Reading-Reading gap in Evanston (below standard).

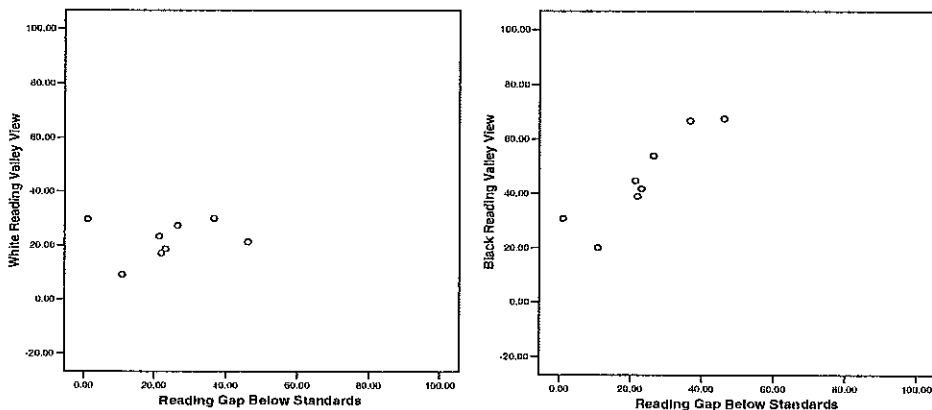


Figure 13a-b: White and Black Reading-Reading gap in Valley View (below standard)

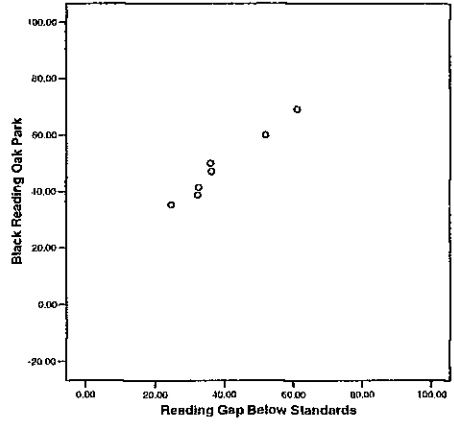
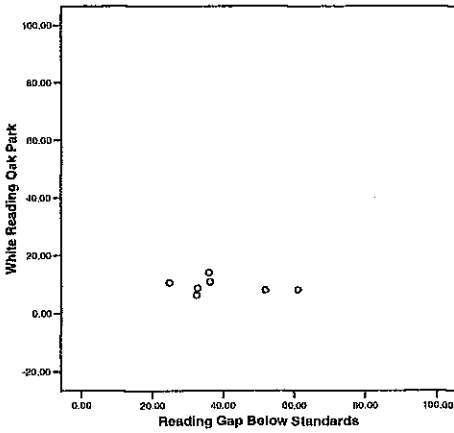


Figure 14a-b: White and Black Reading-Reading gap in Oak Park (below standard)

As can be seen in Figures through 12a-b to 14a-b, at the school level, in each district white students achievement is uniformly better than black students; moreover white achievement follows a flat path with the exception of School District#46, Aurora and Joliet (Figures 15a-b through 18a-b). I now turn to a discussion of SD#46, Aurora and Joliet that one sees a different pattern.

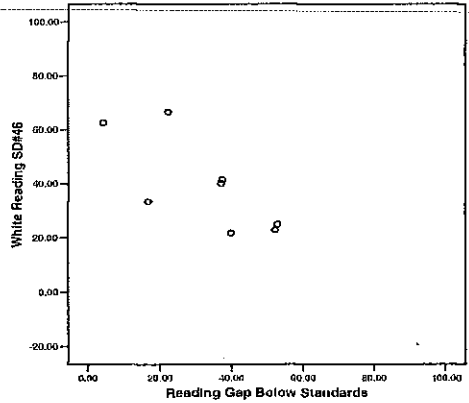
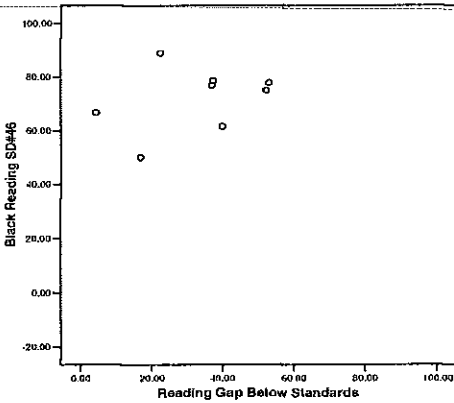


Figure15a-b: White and Black Reading-Reading gap in SD#46(below standard)

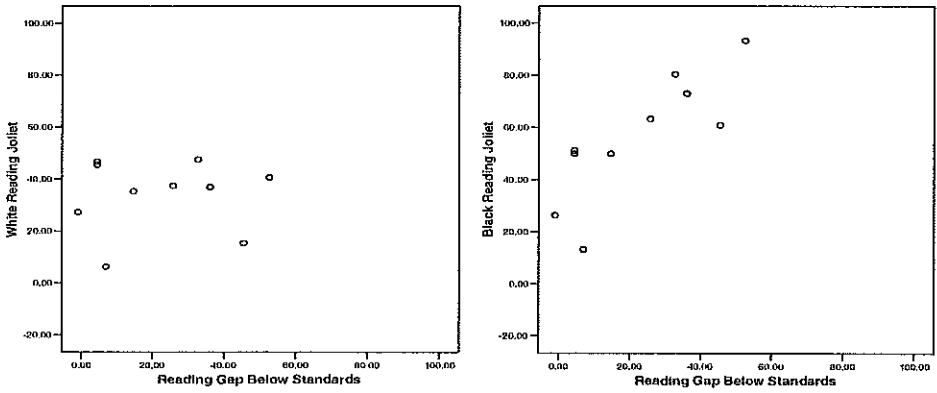


Figure 16a-b: White and Black Reading-Reading gap in Joliet (below standard)

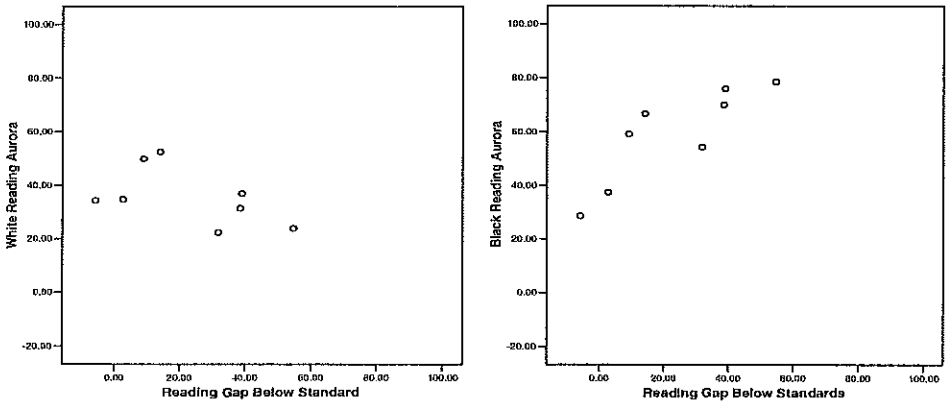


Figure 17a-b: White and Black Reading-Reading gap in Aurora (below standard)

Table 9: School level correlations between gap and black / white reading

Districts	School N	r -Gap White	r - Gap Black	Gap Contribution
Evanston	12	-.75	.97	Both
Oak Park	8	-.86	.84	Both
Aurora	8	-.51	.85	Both
Valley View	8	.14	.91	Black
Joliet	10	.04	.82	Black
SD#46	8	-.75	.33	White

In Table 9, it is attempted to summarize the findings for school level gap production process by looking at within-district correlations to see which cohort group contributes the gap. Table 9 and scatter plots (Figures 12a-b to 17a-b) do not reconcile to offer a basis for meaningful interpretation in comparison with scatters and correlation numbers.

Moreover, it could be observed that when white students' scores are lower, variation of scores tends to be wider. Contrary, black students' variation is wider regardless of their achievement level. High achieving blacks are concentrated in two districts mainly Evanston and Valley View. However, their success is determined by contextual factors depending on the school they attend. Figure 12a-b and 13a-b present the higher scores for white students from two districts (Evanston and Valley View). These districts are the most successful districts for white students.

Math School Level Analysis

In this part, the focus will be on math scores for each district separately. Overall figures present less variation in terms of math achievement scores for both black and white students. The variation can be seen in Evanston, Aurora, Valley View and SD#46 for black students. Considering white achievement, no variation can be seen in math achievement.

It is concluded from the district-level analysis of math achievement that there are two different processes of gap production. Gaps were produced both white and black cohorts. I now turn to an analysis of within district for math, school-level gap-production in six of the districts: Evanston (12 schools), Valley View (8 schools), Oak Park (8 schools), School District #46 (8 schools), Joliet (10 schools) and Aurora (8 schools).

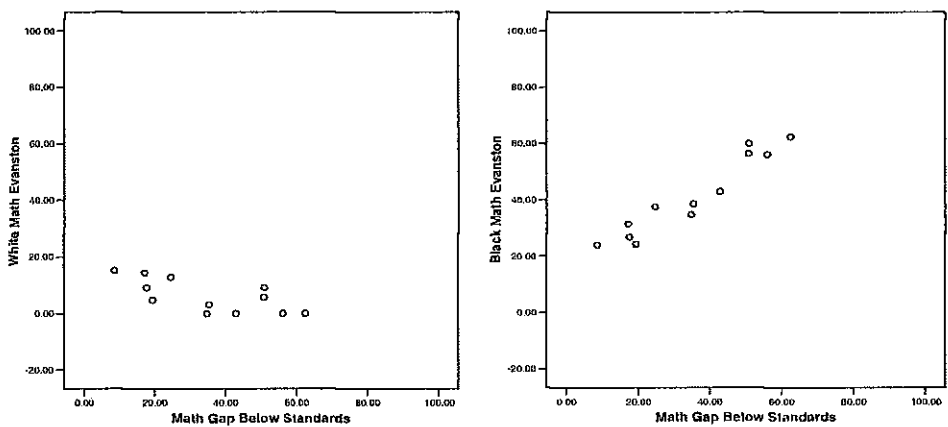


Figure 18a-b: White and Black Math-Math gap in Evanston (below standard)

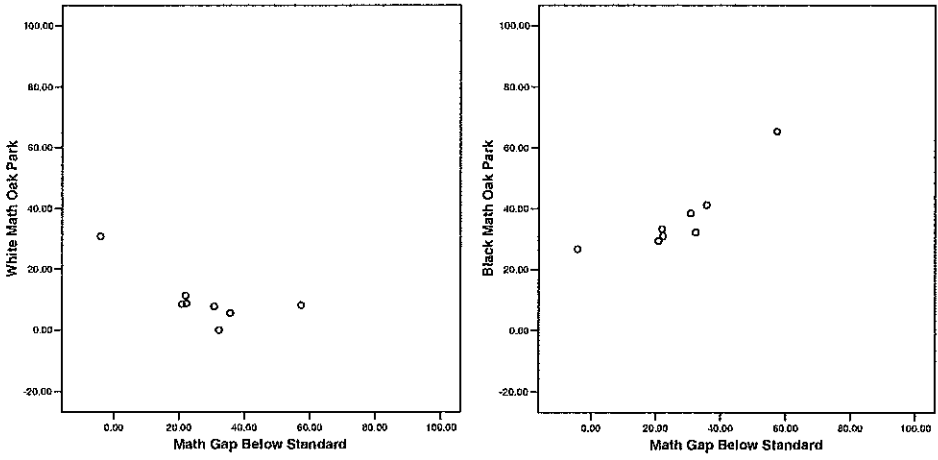


Figure 19a-b: White and Black Math-Math gap in Oak Park (below standard)

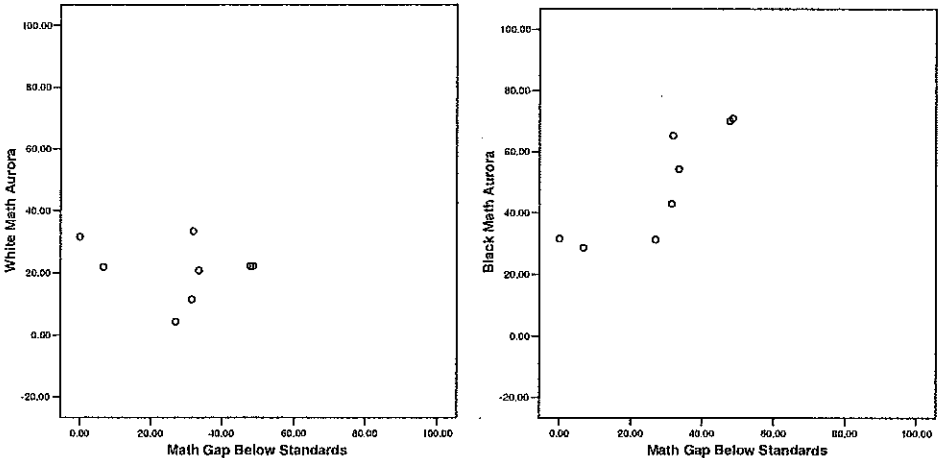


Figure 20a-b: White and Black Math-Math gap in Aurora (below standard)

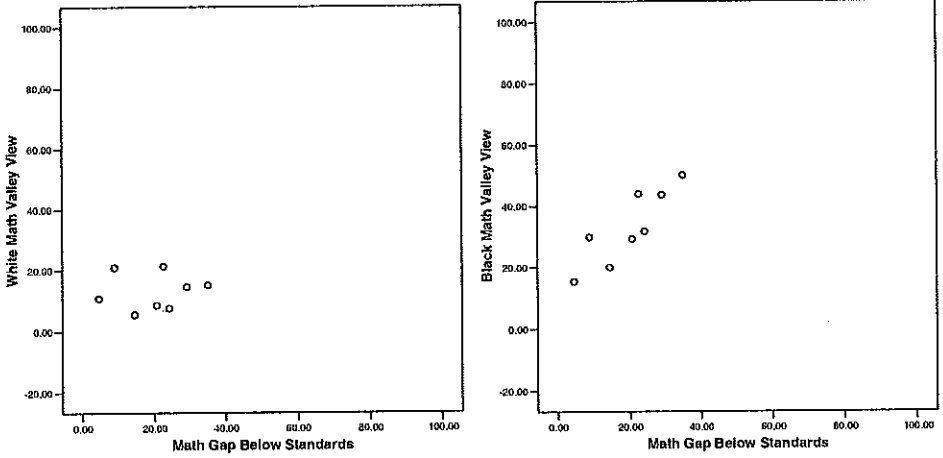


Figure 21 a-b: White and Black Math-Math gap in Valley View (below standard)

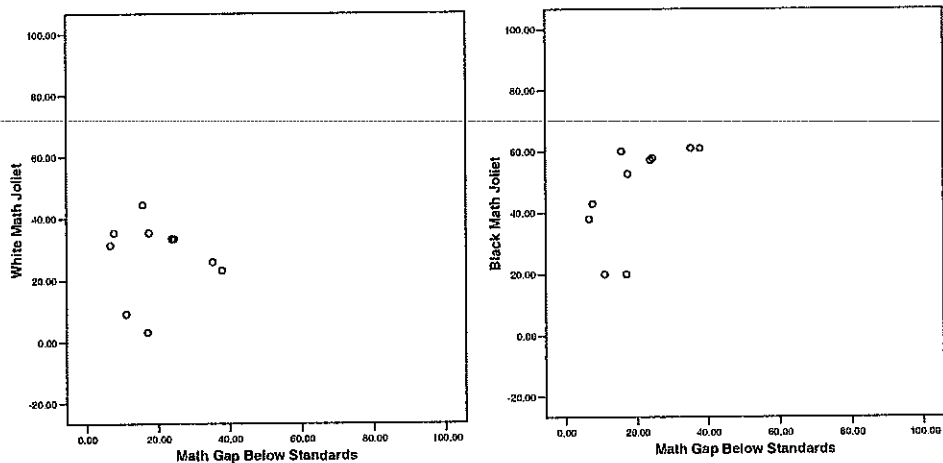


Figure 22a-b: White and Black Math-Math gap in Joliet (below standard)

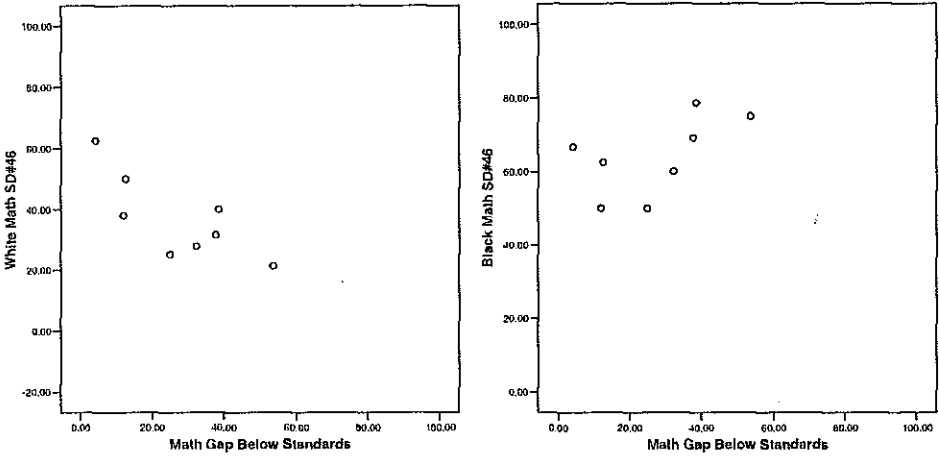


Figure 23a-b: White and Black Math-Math gap in SD#46 (below standard)

Table 10: School level correlations between gap and black / white math

Districts	School N	Cor - Gap White	Cor - Gap Black	Gap Contribution
Evanston	12	-.70	.95	Both
Oak Park	8	-.73	.87	Both
SD#46	8	-.77	.56	Both
Valley View	8	.06	.87	Black
Joliet	10	.04	.62	Black
Aurora	8	-.20	.85	Black

In table 10, I attempt to summarize the findings for school level gap production process by categorizing correlation numbers to see which cohort group contributes the gap. Again table 10 and scatter plots (figures 18a-b to 23a-b) do not reconcile to offer a basis for a meaningful interpretation in comparison with scatters and correlation numbers.

Conclusion

This study identifies multiple gap production processes for both math and reading achievement in Chicago Metro area Comparing Ke's (2003) study about downstate patterns. 10 (9 districts for the reading) Metro area districts show different characteristics about gap production process. There is not a single different achievement gap production process in statewide for math and reading. Downstate districts and Chicago Metro area districts show disparate trends in producing the achievement gap.

As a conclusion, there is more complicated picture of the gap production processes in reading. This complication become clearer when one looks at school level and district level separately. As I argued, with the help of tables and figures, at the district level the gap in reading and math is a function of white achievement similar to Ke's (2003) findings in reading and math. It should be noted that white cohorts' contribution to the gap in reading is more noticeable and dramatic than it is in math. However, as I move into each district, there is more variation in the mean percentages of black cohorts across schools.

The study shows that further studies are necessary to illuminate gap production gap situation. The study highlights gap production processes and complications associated with understanding the gap. Even to understand factors causing the achievement gap between black and white students requires examining from multiple point of view, that is, one cannot afford to name single factor either race or social class for getting a whole picture about the achievement gap.

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