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**ABSTRACT**

City-wide all-day kindergarten was instituted in the New York City public schools in the 1983-84 school year. Follow-up studies of two evaluations of all-day kindergarten, a prospective study and a retrospective study, were undertaken to examine whether enrollment in all-day kindergarten (ADK) resulted in higher third-grade academic achievement than did enrollment in half-day (HDK) kindergarten. An additional study traced early grade enrollment and promotion patterns of two cohorts: those in kindergarten in the first year of city-wide ADK and those in kindergarten the year before ADK implementation. Findings disclosed no consistent meaningful differences in mean achievement of HDK and ADK children. Percentages of third-graders who were reading at or above grade level were lower than they had been at the end of second grade. Additional findings suggested that a substantial proportion of third-graders had not been exposed to the antecedents upon which the curriculum was built, that early grade attrition may not be a statistically random event, and that children who remain in the system may be weaker academically than those who leave the system. (RH)

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July, 1988

1986-87

THIRD-GRADE FOLLOW-UP  
OF THE  
LONGER-TERM EFFECTS  
OF  
ALL-DAY KINDERGARTEN

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## A SUMMARY OF THE REPORT

### FOCUS OF THE REPORT

City-wide all-day kindergarten was instituted in the New York City public schools in the 1983-84 school year. The initiative's objectives were to better prepare pupils for school, lessen the need for remediation, and decrease referrals to special education. Follow-up studies of two evaluations of all-day kindergarten, a prospective study and a retrospective study, were undertaken to examine whether enrollment in all-day kindergarten resulted in higher third-grade academic achievement than did enrollment in half-day kindergarten. A third-grade follow-up of a city-wide study of reading achievement was conducted using reading scores from spring, 1987. An additional study, the Cohort Study, examined the enrollment and promotional patterns of two cohorts of pupils from kindergarten through third grade.

### PROSPECTIVE ALL-DAY KINDERGARTEN STUDY

A 1983-84 study of all-day kindergarten found that a sample of children in all-day kindergarten classes made greater gains in readiness skills than did a sample of pupils in half-day kindergarten classes. No such differences on a test of reading achievement were found for these groups at the end of the second grade. This follow-up study examined the performance of the all-day and half-day groups on a variety of indicators one year later.

#### Findings

- \* There was no meaningful difference in the rates at which pupils who had attended half-day or all-day kindergarten left the New York City public school system during the third grade.
- \* There were no substantive differences in the rates of referral to or placement in special education between pupils who had attended half-day or all-day kindergarten.
- \* Pupils who had attended half-day kindergarten manifested somewhat higher reading achievement than did pupils who attended all-day kindergarten. Pupils who attended monolingual kindergarten classes had higher average third-grade reading scores than did those who attended bilingual kindergarten classes. When the second-grade and third-grade reading tests were equated for comparison, it was found that median reading scores had declined from the second grade to the third grade.

- \* Average mathematics scores for all four groups of pupils were on grade level. Those who had attended half-day monolingual kindergarten classes had a somewhat higher average normal-curve-equivalent score on the third-grade mathematics test than did their all-day kindergarten counterparts. Pupils who attended bilingual kindergarten classes had a lower mean mathematics score; among these pupils there was no difference between half-day and all-day kindergarten pupils.

#### RETROSPECTIVE ALL-DAY KINDERGARTEN STUDY

The second study compared third-grade achievement in two samples from different cohorts. One group attended half-day kindergarten in a randomly chosen sample of schools in 1982-83, the other group attended all-day kindergarten in the same schools in 1983-84.

##### Findings

- \* There was no difference in the mean reading scores of the two groups at the end of the third grade. There was a small difference in the percentage of pupils who were reading at or above grade level in favor of those who had attended all-day kindergarten.
- \* A greater percentage of pupils who had attended all-day kindergarten scored at or above grade level on the third-grade mathematics test than was the case for those who attended half-day kindergarten.

#### CITY-WIDE KINDERGARTEN STUDY

The third study examined 1986-87 third-grade reading achievement using city-wide data. The reading scores of pupils who attended New York City public school kindergarten were compared with those of pupils who had not attended kindergarten in the New York City public schools.

##### Findings

- \* On a city-wide basis, 30 percent of third graders who had not attended kindergarten in New York City public schools were reading at or above grade level. Approximately 45 percent of third graders who attended either half-day or all-day kindergarten were reading at or above grade level.

#### COHORT STUDY

The fourth study examined the enrollment and promotional patterns of two cohorts of pupils: Those whose kindergarten year was 1982-83 and those whose kindergarten year was 1983-84, the first year of city-wide all-day kindergarten.

### Findings

- \* With the inception of city-wide all-day kindergarten, there was a shift in enrollment in the New York City public schools: A greater percentage of the cohort entered the school system in kindergarten than in the previous year, when a relatively higher percentage entered the public schools in the first grade.
- \* The size of both cohorts shrinks after the first grade as more pupils are held in grade and leave the school system than enter it.
- \* Approximately 7 percent of pupils are retained in the first and second grades.
- \* Close to 30 percent of the pupils who entered the New York City public schools in either kindergarten or the first grade were no longer enrolled in the school system by the end of the third grade.

### RECOMMENDATIONS

- \* City-wide all-day kindergarten should be continued. It has resulted in earlier enrollment in the New York City public schools of a substantial number of children who would otherwise have entered the school system in the first grade.
- \* Children who enter the New York City public schools after kindergarten should be identified and provided with those educational experiences to which they were not exposed because of their late entry into the public school system.

## I. GENERAL INTRODUCTION

This report is a continuation and amplification of the evaluation of all-day kindergarten in the New York City public schools. All-day kindergarten was instituted on a city-wide basis during the 1983-84 school year, prior to which most children attended half-day kindergarten classes provided by community school districts. One argument for all-day kindergarten was that a longer school day would better prepare children for school and would result in a decreased need for remediation and fewer referrals to special education.

A tripartite study<sup>1</sup> of the longer-term effects of all-day kindergarten through second grade was undertaken. It included a prospective study of samples of pupils who attended half-day or all-day kindergarten classes in 1983-84. Another study was a retrospective examination of achievement among children who attended kindergarten in a sample of schools in two successive years: The first group attended half-day kindergarten; the second group attended all-day kindergarten. Neither study found meaningful differences in mean achievement between groups of children who had attended half-day kindergarten and all-day kindergarten.

The third part of the second-grade evaluation was a look at city-wide reading achievement among the pupils whose kindergarten

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<sup>1</sup>1985-86 Longer-Term Effects of All-Day Kindergarten, published by the Office of Educational Assessment of the New York City Board of Education.

year, 1983-84, coincided with the beginning of all-day kindergarten on a city-wide basis. No difference was found in the mean reading achievement of second graders who attended all-day kindergarten and those who attended the few half-day kindergarten classes still in existence in 1983-84. Both groups were reading at grade level. A quite large difference was found, however, between second graders who attended public kindergarten (of either sort) and second graders who had not attended public kindergarten but had entered the public school system during the first or second grades. The latter were, on average, reading significantly below grade level. It was concluded that the overall city-wide statistic masked the existence of significantly different groups.

The current report continues the three previously undertaken studies through the third grade. A fourth study is an attempt to trace the early grade enrollment and promotion patterns of two cohorts of pupils in the New York City public schools: Those whose kindergarten year was 1982-83 and those whose kindergarten year was 1983-84, the first year of city-wide all-day kindergarten. Its rationale was twofold: To look for differences in such patterns as a result of the institution of city-wide all-day kindergarten and to provide basic information on the progress of a cohort of general education pupils through the school system, about which there is currently little information available.

## II. THE PROSPECTIVE ALL-DAY KINDERGARTEN STUDY

### INTRODUCTION

This evaluation is the third-grade follow-up study of 5500 pupils who entered public kindergarten in the 1983-84 school year, the first year that all-day public kindergarten was available on a city-wide basis in New York City. The pupils involved in the study comprised four groups divided between half-day and all-day monolingual and bilingual kindergarten classes.<sup>2</sup> The samples were studied in a prospective manner in that demographic data were collected at the beginning of the initial evaluation, during the kindergarten year, and the findings examined at two later stages in their school careers, at the end of kindergarten and at the end of second grade.

The major study, at the end of the second-grade year, 1985-86, compared academic achievement of the pupils who had attended all-day kindergarten with those who had attended half-day kindergarten. Children of language minority background were tested for English proficiency with the Language Assessment Battery (LAB) at the beginning of kindergarten and each succeeding spring until they were no longer considered eligible for bilingual education. No difference was found in the rate at which such children became ineligible for bilingual instruction if they had attended either

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<sup>2</sup>See the previously mentioned OEA report, The Longer-Term Effects of All-Day Kindergarten, for a complete description of the samples, the methodologies employed and the findings of the original evaluation and the effects through the second-grade year.

half-day or all-day monolingual kindergarten. Among pupils who had attended bilingual kindergarten classes, a slightly higher percentage of half-day pupils was still entitled to bilingual education at the end of second grade than was the case for pupils who had attended all-day bilingual kindergarten classes. There were no meaningful differences between the mean reading scores for half-day and all-day kindergarten samples within the monolingual/ bilingual classroom condition at the end of second grade. Both of the monolingual kindergarten samples manifested higher--but not significantly different--proportions of pupils who were reading at or above grade level than was true for all second-graders on a city-wide basis. The percentage of half-day bilingual pupils reading at or above grade level was lower than that of the all day bilingual classes and lower than the second-grade city-wide rate. Similar levels of achievement in mathematics were found at the end of second grade.

#### DESIGN AND METHOD

This evaluation consisted of two parts. The first examined pupil attrition from the four original samples during the 1986-87 school year and the placement of pupils in special education programs. Outcome measures, which constituted the second part of this follow-up evaluation, were scores on the third-grade reading and mathematics achievement tests of pupils in the four original kindergarten samples. Also examined were the samples' rates of limited English proficiency at the end of the third-grade, as assessed by the LAB.

The analysis of achievement in mathematics was straightforward as the Metropolitan Achievement Test (MAT) was administered on a city-wide basis in both second and third grades, thus facilitating a longitudinal analysis. A year-to-year analysis of reading achievement was problematic as different reading tests were administered in the second and third grades. Second graders took the MAT reading test whereas third graders took the Degrees of Reading Power (D.R.P.) test. Although the Office of Educational Assessment has developed a table which equates third-grade MAT to D.R.P. scores, it converts only percentiles and normal curve equivalents (N.C.E.'s). As the D.R.P. percentiles and N.C.E.'s do not cover the full range of 1 to 99, the upper range of MAT scores could not be converted to D.R.P. equivalents, thereby truncating the distribution of second grade MAT scores. As a result, the analysis of reading achievement in this evaluation focused on the third-grade results and examined second-grade to third-grade reading results in terms of median scores and rates of eligibility for Chapter I funding in the four kindergarten groups.

Information on pupil attrition was acquired from the Biofile database maintained by the Office of Educational Data Services. Data concerning placements in special education programs were obtained from the special education data bank maintained by the Division of Special Education. Achievement test scores were obtained from the city-wide test tapes created and maintained by O.E.A.. All of these sources of information were matched to the

computer files created for the original kindergarten evaluation and for the 1985-86 follow-up evaluation.

The questions which the third-grade follow-up seeks to answer are the following:

- \* Was there a difference in the rates at which pupils left the public school system during the third grade which was traceable to whether they had attended half-day or all-day kindergarten?
- \* Were there differences in the rates of referral to or placement in special education for pupils who attended half-day kindergarten as compared to pupils who attended all-day kindergarten?
- \* Was there a difference in third-grade reading achievement between pupils who attended half-day kindergarten and pupils who attended all-day kindergarten?
- \* Was there a difference in third-grade mathematics achievement between pupils who attended half-day kindergarten and pupils who attended all-day kindergarten?

#### FINDINGS

Data on pupil attrition during the third grade are presented in Table 2.1. The percentages of pupils who left the New York City public school system were slightly higher among those who had attended half-day kindergarten, monolingual or bilingual. The difference was due entirely to greater percentages of pupils being removed from New York City, which ranged from two percent to nine percent. It should be noted that the absolute numbers of pupils involved, particularly among the half-day kindergarten groups, were low and caution must therefore be exercised in their interpretation.

The findings of the analysis of referrals for and placements in special education are presented in Tables 2.2 and 2.3, respectively. The cumulative rates of referral for special education

Table 2.1

Reasons for Discharge of Students in the Kindergarten Samples  
During the Third Grade, 1986-87

Reason For Discharge	<u>Monolingual Classes</u>				<u>Bilingual Classes</u>			
	<u>All-Day*</u>		<u>Half-Day</u>		<u>All-Day*</u>		<u>Half-Day</u>	
	<u>N</u>	<u>PCT</u>	<u>N</u>	<u>PCT</u>	<u>N</u>	<u>PCT</u>	<u>N</u>	<u>PCT</u>
Admitted to Private/Parochial School	38	1.0%	1	0.2%	1	0.2%	1	0.8%
Left N.Y.C.	99	2.6	26	6.0	8	1.9	11	8.9
Not Found	10	0.3	--	---	1	0.2	2	1.6
Other	1	0.0	3	0.7	--	---	--	---
<u>Totals</u>	148	3.9	30	7.0	10	2.3	14	11.3

\*PCT = Percentage of original group purged of pupils who left the public school system during the second grade.

showed no difference between the half-day and all-day kindergarten groups. Ten percent of the monolingual kindergarten pupils and seven percent of the bilingual kindergarten pupils were referred for special education. The most common reason for referral for special education was learning disability and the referral rate for this condition was notably consistent across all groups. There was no difference between the half-day kindergarten and all-day kindergarten groups in the cumulative percentages of pupils placed in special education programs through the third grade. The rates of placement across program categories were slightly higher for the pupils who had attended monolingual kindergarten classes (nine percent) than for pupils who had attended bilingual kindergarten classes (six percent) but this may have been due to sampling fluctuations. The percentages of pupils placed in any given programmatic category were strikingly consistent across kindergarten groups.

Results of the third-grade reading test are presented in Table 2.4. The third graders who attended half-day kindergarten, whether monolingual or bilingual, manifested slightly higher mean scores on the D.R.P. test than did those who attended all-day kindergarten. The difference was 2 raw score points between the monolingual groups; it was 5 raw score points between the bilingual groups. Included on Table 2.4 are the percentages of pupils who scored at or above the state reference point on the D.R.P., the point below which students are considered to be in need of remediation. Among the monolingual kindergarten groups, 25 percent of the half-day group and 29 percent of the all-day

Table 2.2

Primary Diagnosis of Pupils in the Kindergarten Samples  
Referred for Special Education Through the Third Grade, 1986-87

Diagnosis	<u>Monolingual Classes</u>				<u>Bilingual Classes</u>			
	<u>All-Day</u>		<u>Half-Day</u>		<u>All-Day</u>		<u>Half-Day</u>	
	<u>N</u>	<u>PCT*</u>	<u>N</u>	<u>PCT*</u>	<u>N</u>	<u>PCT*</u>	<u>N</u>	<u>PCT*</u>
Emotionally Disabled	71	1.7%	6	1.1%	6	1.3%	2	1.4%
Learning Disabled	225	5.3	25	4.7	18	4.0	7	5.0
Speech Impaired	60	1.4	9	1.7	4	0.9	--	---
Other	11	0.3	1	0.2	1	0.2	--	---
Non-Handicapped	60	1.4	11	2.0	4	0.9	1	0.7
<u>Totals</u>	427	10.0	52	9.7	33	7.3	10	7.7

\*PCT = Percentage of original group.

Table 2.3

Special Education Program Placements of Pupils  
in the Kindergarten Samples  
Through the Third Grade, 1986-87

Program	<u>Monolingual Classes</u>				<u>Bilingual Classes</u>			
	<u>All-Day</u>		<u>Half-Day</u>		<u>All-Day</u>		<u>Half-Day</u>	
	<u>N</u>	<u>PCT*</u>	<u>N</u>	<u>PCT*</u>	<u>N</u>	<u>PCT*</u>	<u>N</u>	<u>PCT*</u>
Specialized Inst. Environ.	16	0.4%	1	0.2%	1	0.2%	--	---
Self-Contained Classes	134	3.1	17	3.2	14	3.1	3	2.2
Resource Rooms	141	3.3	17	3.2	5	1.1	5	3.6
Other	81	1.9	13	2.4	6	1.3		
<u>Totals</u>	372	8.7	48	8.9	26	5.7	8	6.8

\*PCT = Percentage of original group.

group scored below this benchmark. Among the bilingual groups, 38 percent of the half-day sample and 41 percent of the all-day sample fell below the state reference point.

TABLE 2.4  
 Mean Raw Score on the D.R.P., Spring, 1987  
 and Percent of Pupils At Or Above State Reference Point  
 (All Students with Valid Scores)

Sample	N	Mean Raw Score	Standard Deviation	Percent At/Above State Reference Point
<u>Monolingual</u>				
All-Day Kindergarten	2223	34.3	(11.6)	71%
Half-day Kindergarten	255	36.6	(12.0)	75
<u>Bilingual</u>				
All-Day Kindergarten	217	24.5	(10.9)	59
Half-Day Kindergarten	58	30.7	(9.9)	62

Table 2.5 presents the results of the equated second- and third-grade reading scores for pupils who had valid scores on both reading tests. For the half-day monolingual group, the median N.C.E. at the end of second grade was 55 and 50 at the end of the third grade. The comparable figures for the all-day monolingual group were 54 and 48. Among the bilingual groups, the median N.C.E.'s for the half-day sample were 41 and 43 and the median N.C.E.'s for the all-day sample were 43 and 40. These results indicate that, with the possible exception of the bilingual half-day group, reading achievement--vis-vis the norming population of the test--tended to decline from the end of

the second-grade to the end of the third grade among those pupils who had taken both reading tests. There were no substantive differences between the medians of the half-day and all-day groups within the monolingual/bilingual condition at the end of either second grade or third grade.

TABLE 2.5

Median N.C.E. on the MAT Reading Test and MAT-Equated Scores  
Spring 1986 and Spring 1987  
(For Pupils With Valid Scores on Both Tests)

Sample		1986 Median	1987 Median
<u>Monolingual</u>			
All-Day Kindergarten	1779	54	48
Half-day Kindergarten	199	55	50
<u>Bilingual</u>			
All-Day Kindergarten	170	43	40
Half-Day Kindergarten	40	41	42.5

Results of the year-to-year analysis of mathematics achievement are presented in Table 2.6. The data indicate that, for the monolingual groups, average mathematics achievement remained constant and above average as compared to the norming population of the test. The half-day monolingual sample, on average, performed slightly better in both second and third grade than did the all-day monolingual sample. Among the bilingual groups, the all-day sample performed slightly better than did the half-day group at the end of second grade. The former's mathematics

achievement at the end of third grade showed a slight decline from the previous year's level and was virtually the same as that of the latter at the end of third grade. Both of the bilingual groups' mean mathematics scores were at grade level in both second and third grades.

TABLE 2.6

Mean N.C.E.'s on the MAT Mathematics Test  
Spring 1986 and Spring 1987  
(For Pupils With Valid Scores on Both Tests)

Sample	N	1986		1987	
		Mean N.C.E.	Standard Deviation	Mean N.C.E.	Standard Deviation
<u>Monolingual</u>					
All-Day Kinder.	2063	57.6	(24.6)	57.1	(23.5)
Half-day Kinder.	238	60.0	(25.4)	61.1	(23.1)
<u>Bilingual</u>					
All-Day Kinder.	201	53.9	(25.2)	49.7	(22.5)
Half-Day Kinder.	51	50.1	(27.8)	51.0	(21.0)

Examination of the demographic data for the four kindergarten groups revealed no substantive group differences in the rates at which children left the New York City public school system or in their primary diagnoses when referred for special education or in their rates of placement in special education programs. Neither were differences found between the half-day and all-day kindergarten groups on third-grade reading or mathematics achievement tests.

### III. THE RETROSPECTIVE ALL-DAY KINDERGARTEN STUDY

#### INTRODUCTION

This follow-up study of a retrospective evaluation compares reading achievement among pupils who attended all-day kindergarten with that of pupils who attended half-day kindergarten. The two samples included all pupils who were enrolled in kindergarten classes in a set of New York City public elementary schools in two successive cohorts. One sample consisted of pupils who attended half-day kindergarten during the 1982-83 school year; the second consisted of pupils who attended all-day kindergarten in the same schools during the 1983-84 school year. Reading achievement of pupils in these samples was examined at the end of second grade as were the demographic profiles and attendance rates of the samples.

The results of the second-grade analysis found no meaningful differences between the samples in their demographics, attendance, or rates at which pupils acquired English language skills, the latter measured by the LAB. The pupils who attended half-day kindergarten had a slightly higher mean reading score than those who attended all-day kindergarten. This finding was attributed to differences in the second-grade reading tests taken by the two samples of pupils, which had been equated for purposes of the analysis.

The questions which the third-grade follow-up evaluation sought to answer were the following:

- \* Was there a difference, at the end of the third grade, in mean reading achievement between the sample of pupils who attended half-day kindergarten in 1982-83 and the sample of pupils who attended all-day kindergarten in 1983-84?
- \* Was there a difference, at the end of the third grade, in mean mathematics achievement between the sample of pupils who attended half-day kindergarten in 1982-83 and the sample of pupils who attended all-day kindergarten in 1983-84?

#### DESIGN AND METHOD

The current evaluation consisted of examination of the third-grade reading and mathematics scores for the two samples. The half-day sample attended third grade in 1985-86; the all-day sample attended third grade in 1986-87. Third-grade reading scores on the Degree of Reading Power test (D.R.P.) and scores on the city-wide mathematics test for each cohort were obtained from the central archive of computer test tapes maintained by O.E.A.. These were matched to the program files used in the second-grade evaluation and the relevant statistics were computed.

#### FINDINGS

The third-grade mean D.R.P. scores of the half-day kindergarten sample and of the all-day kindergarten sample were nearly identical (32.4 for the half-day sample, 32.8 for the all-day sample). Examination of reading achievement in terms of percentages of pupils who placed at or above the fiftieth percentile (the point at which pupils are presumed to be reading at grade level) revealed a small difference between the two samples: 61 percent of the half-day kindergarten sample placed at or above the fiftieth percentile; the comparable figure for the all-day kindergarten sample was 64.8 percent.

Results of the analysis of third-grade mathematics scores revealed that the mean raw score for the half-day sample was 57.1 and for the all-day sample was 58.5. The percentages of pupils who placed at or above grade level were 50.3 percent for the half-day sample and 57.8 percent for the all-day sample. While both samples were, on average, at grade level in mathematics, the all-day kindergarten sample apparently performed somewhat better than did the half-day kindergarten sample.

#### IV. THE CITY-WIDE KINDERGARTEN STUDY

##### INTRODUCTION

This is a follow-up examination of reading achievement among pupils of the 1983 cohort, those pupils who, if they entered the New York City public schools in kindergarten and remained on grade, were in third grade during the 1986-87 school year.

The previous study examined reading achievement among the same cohort of pupils at the end of their second-grade year, spring of 1986. That study compared the second-grade reading achievement of pupils in the cohort who had attended New York City public kindergarten, either half-day or all-day, with that of pupils who had not attended New York City public kindergarten, having entered the school system in either the first or second grade. The second grade study found that there was no substantive difference in mean reading achievement between pupils who attended half-day or all-day public kindergarten; both groups were reading on grade level. This was in contrast with the reading achievement of second graders who entered the public school system after the kindergarten year, who were, on average, reading at the forty-first N.C.E., considerably below grade level. The disparity between the groups was even greater when reading achievement was examined in terms of the percentages of pupils reading at or above grade level: Fifty-one percent of the kindergarten group (collapsing the half-day and all-day groups) were reading at or above grade level, as compared to 33 percent of the no-kindergarten group. The analysis indicated that the

city-wide rate of second graders of the 1983 cohort reading at or above grade level, 42.3 percent, obscured the existence of at least two major subgroups of pupils, one of whom manifested considerably poorer reading achievement and one of whom manifested considerably better reading achievement.

This third-grade follow-up study sought to examine reading achievement for the same cohort of pupils (those whose kindergarten year was 1983-84), once again examining the achievement levels of pupils who had attended half-day or all-day public kindergarten and those who had entered the New York City public schools during or after the first grade.

#### DESIGN AND METHOD

The method employed in the follow-up study was the same as that of the second-grade study. The early childhood database, a listing of all pupils who attended half-day or all-day kindergarten during 1983-84, was matched to the computer file containing the third-grade city-wide reading scores for spring, 1987. Since second-graders are tested with the MAT and third-graders are tested with the D.R.P., it was decided to use reading scores which had been equated to MAT N.C.E.'s. This permitted more meaningful comparisons between the second-grade and third-grade findings than would otherwise be the case. One drawback of using the MAT-equated N.C.E.'s, developed by O.E.A., was a truncated distribution which did not permit mathematical calculations. Thus, mean N.C.E.'s could not be computed and the sole statistic available was the percent of pupils reading at or above grade level.

## FINDINGS

The findings of the third-grade reading score analysis were as follows: 43.6 percent of the half-day kindergarten group and 46.1 percent of the all-day kindergarten group were reading at or above grade level. The comparable figure for the no-kindergarten group was 30.1 percent. The city-wide rate was 36.9 percent.

These findings indicated that, for the 1983 cohort, slightly lower percentages of pupils were reading at or above grade level at the end of third grade than was the case at the end of second grade. This was so for all three groups and for the city-wide rate. The difference between the two kindergarten groups, on the one hand, and the no-kindergarten group, on the other, was the same as that found at the end of the second grade. Once again, the city-wide rate of pupils reading at or above grade level masked important group differences.

## V. THE LONGITUDINAL COHORT STUDY OF PUPIL ENROLLMENT PATTERNS

### INTRODUCTION

A longitudinal study of early grade enrollment patterns was undertaken in conjunction with the third grade follow-up evaluations of all-day kindergarten and the examination of city-wide achievement among third-grade pupils. The primary objective of this undertaking was to track two cohorts of pupils in general education in their educational careers through third grade and thus to provide a 'snapshot' of early childhood educational patterns in the New York City public schools. The secondary objective of the study was to compare the enrollment and promotion patterns of two cohorts of pupils: Those whose kindergarten year, 1982-83, immediately preceded the institution of city-wide all-day kindergarten, and those whose kindergarten year coincided with the beginning of city-wide all-day kindergarten in 1983-84. An attempt was also made to examine the enrollment of special education pupils, although this was complicated by the absence of a traditional grade structure in special education.

### METHOD

The source of information for the enrollment study was the Biofile database maintained by the Office of Educational Data Services. The Biofile contains, among other types of data, enrollment information for all pupils in the New York City public schools including admission/discharge, grade, and school data. The current study utilized the first two categories of Biofile data to track pupils' enrollment and promotional patterns.

Mobility within the public school system, from school to school, was beyond the scope of the study.

Pupils of the two cohorts to be examined were identified by dates of birth from the updated year-end versions of the Biofile for the years 1983 through 1987. Admission/discharge data and grade data for four years--corresponding to the kindergarten through third-grade years--were concatenated into a pattern for each pupil. This pattern indicated the year the child entered the public school system, the grades attended in each of the four years, and the year discharged, if applicable. Such an approach permitted identification of pupils who entered the school system in each grade, those who were promoted, those who were held over, and those who left the school system. Included in the primary study of general education were only those pupils for whom complete data were available for all four of the years on which the study focussed. As a result, approximately eight to ten percent of the data for the general education pupils were lost due to missing or inaccurate data elements. Information on holdovers in the third grade was unavailable as the method of using end-of-year versions of the Biofile would have necessitated use of the 1988 Biofile to obtain information about third-grade holdovers among the 1983-84 cohort, a clear impossibility as the study was undertaken during the 1987-88 school year.

As the purpose of the study was to illuminate patterns of group behavior rather than to assess outcome, there was no analysis of results, per se. Patterns of individual pupil enrollment and promotion were treated as indicators of process

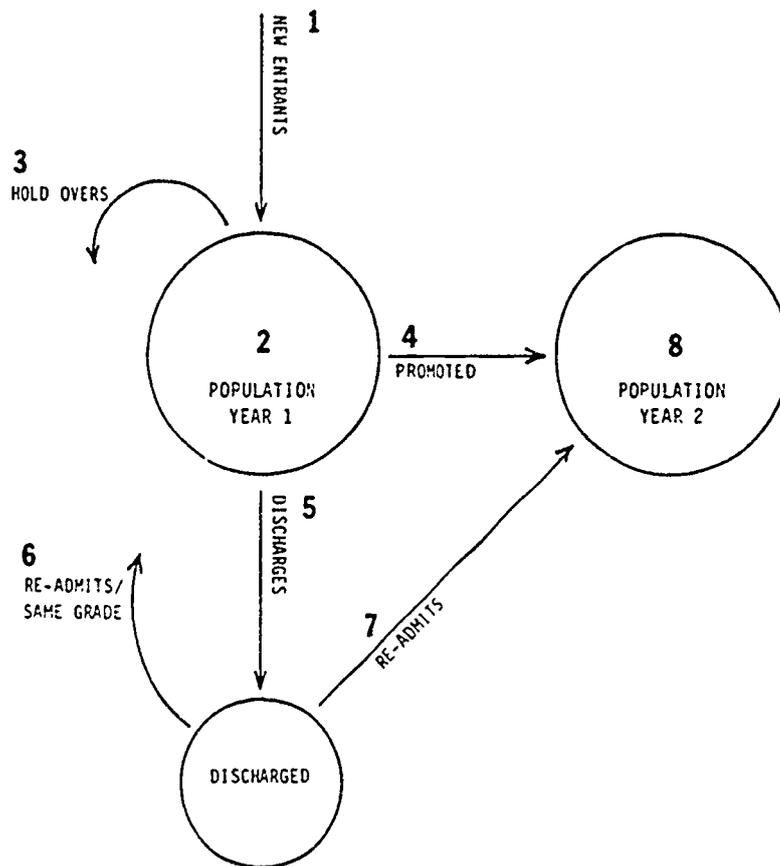
and were aggregated to establish an understanding of cohort behavior.

Pupils whose Biofile data indicated enrollment in special education at any point in the kindergarten through third-grade years were excluded from the study of general education and were included in the subsidiary analysis of special education enrollment. Much of the data on special education pupils was problematic. There were pupils listed in the Biofile as having been placed in special education who were listed as being in general education in subsequent years, a sequence of events which is actually quite rare. These cases were retained in the dataset unless there were other reasons for eliminating them.

#### FINDINGS

Figure 5.1 is presented as a guide to understanding the findings of the general education study in Figures 2 and 3. It should be read as the diagram of a process flowing from left to right. Line 1 represents new entrants into the public school system. Circle 2 denotes the total enrollment in a grade from a single cohort for a given year. Line 3 represents pupils held over in a grade. Line 4 represents children who are promoted, in the routine fashion, to the next grade. Line 5 represents pupils who are formally discharged from the school system. Line 6 represents children who, discharged from the school system, are re-enrolled in the same grade the following year. Line 7 denotes pupils who, though discharged from the public school system, are nevertheless enrolled in the next highest grade the following year. Circle 8 is the total enrollment of the next highest grade

FIGURE 5.1  
Guide to Early Grade Enrollment Patterns

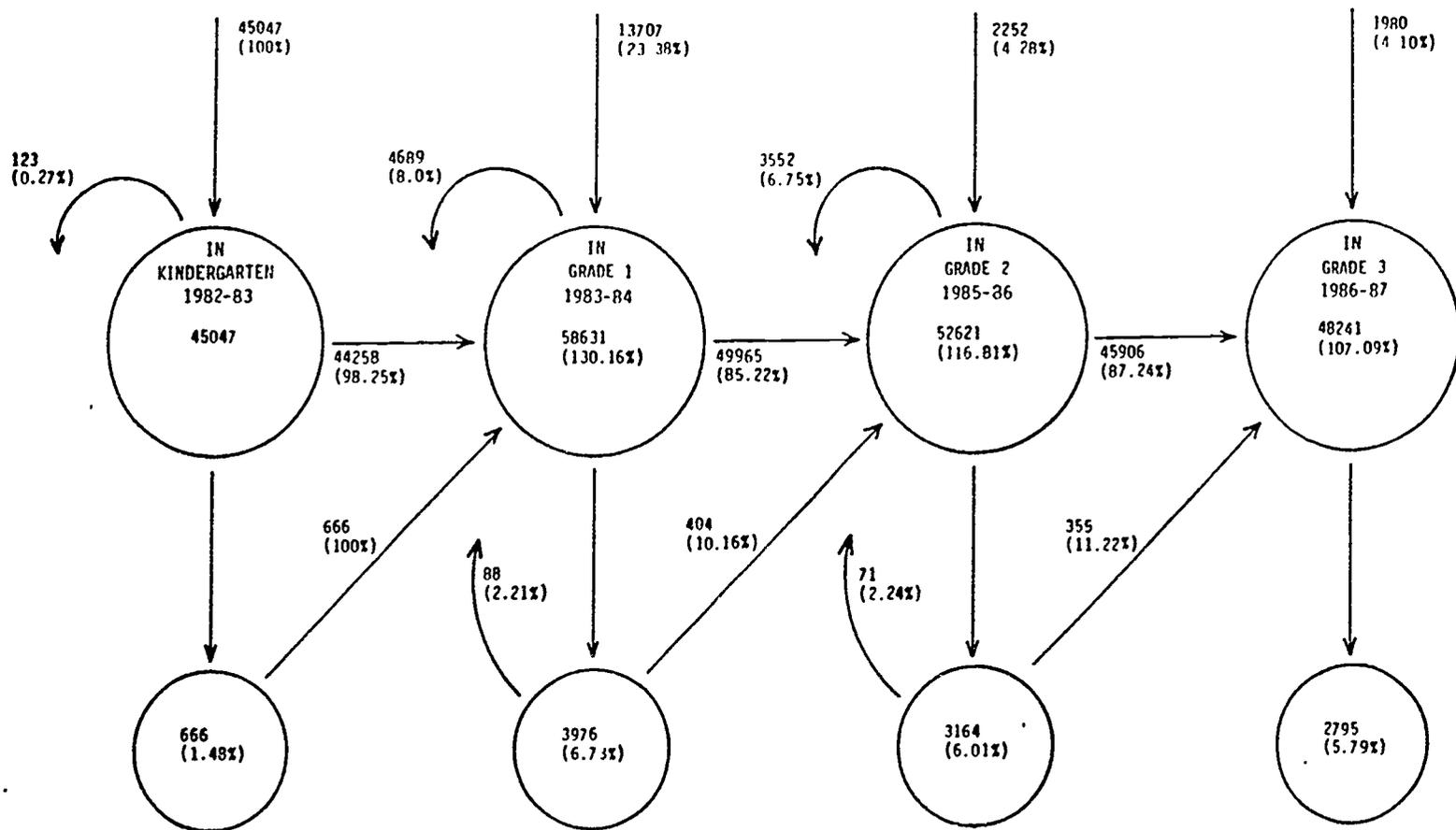


the following year. There are pupils enrolled in every grade who belong to the previous cohort. They are children who have been held in grade and may be thought of as having 'fallen out' of their cohort into the succeeding one; they were not included in this study. In the current study pupils who repeat a grade, represented by Lines 3 and 7, are counted only once, in the first year they attend that grade. Since they are 'left back', they do not contribute to their cohort's total enrollment in the next higher grade (Circle 8).

The percentage of total grade enrollment represented by Line 1 was computed by dividing the number of new entrants for a grade by that grade's total enrollment, Circle 2. Every other percentage which has as its denominator the enrollment of a single year, was computed by dividing the number of pupils denoted by a line or circle by the number of pupils in its source (the place from which an arrow is drawn). The total enrollment of each grade after kindergarten is presented as a percentage of the kindergarten enrollment. Using the kindergarten enrollment as the base permits examination of the cohort's growth or diminution in size as it moves from kindergarten through third grade. It must be borne in mind that the numbers in Figures 5.2 and 5.3 are eight to ten percent lower than they would otherwise be due to missing data. Assuming random error, the percentages are accurate.

Figure 5.2 presents the 'snapshot' of the 1982 general-educational cohort, those pupils whose kindergarten year was in 1982-83. Twenty-three percent of the total first-grade enroll-

FIGURE 5.2  
Early Grade Enrollment Patterns  
1982 Cohort

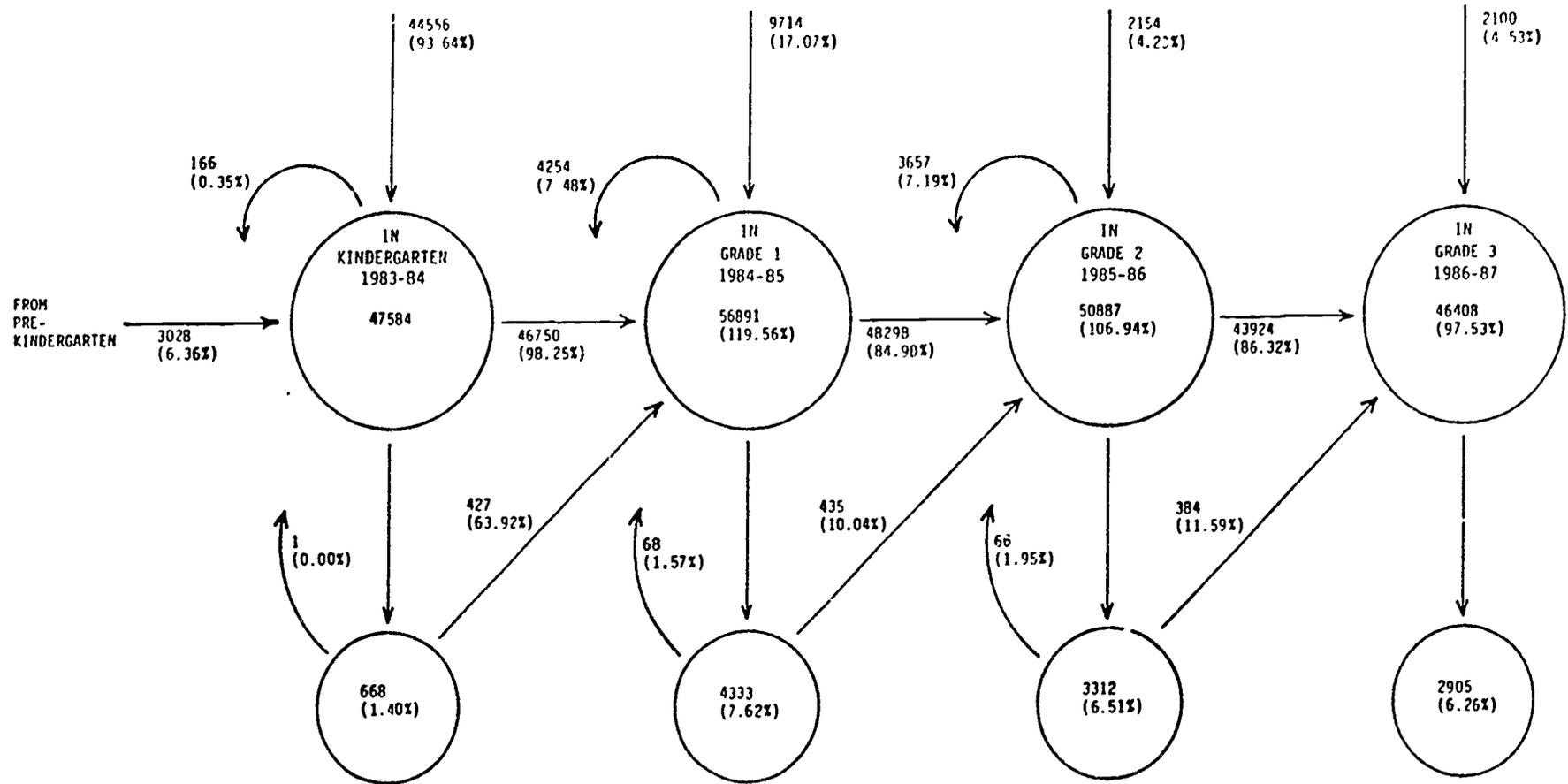


ment entered the public school system that year. New entrants decreased to approximately four percent in each of the succeeding two grades. Note that the absence of pupils entering from pre-kindergarten was a methodological artifact and does not mean that no pupils had attended public pre-kindergarten programs.

Enrollment was greatest in first grade. After that, new entrants were more than offset by holdovers and discharges from the school system, with the result that enrollment declined through third grade. Of those children who entered the public school system in kindergarten, 73.6 percent were still enrolled at the end of third grade. Of those children who entered the school system in first grade, 72.8 percent were still enrolled at the end of third grade.

Figure 5.3 presents the 'snapshot' of the 1983 general-education cohort. The primary difference from the 1982 cohort is that a smaller percentage of the first-graders were new entrants. As there were no differences in new entrants in the second and third grades from the previous year, it may be concluded that a greater proportion of this cohort's pupils entered the school system in kindergarten than did so in 1982. The difference was, presumably, attributable to the institution of all-day kindergarten. Note that a small percentage of kindergarten children in 1983-84 had been in Board of Education prekindergarten programs. Sustained enrollment figures for the 1983 cohort were virtually identical to those of the 1982 cohort: 72.5 percent of the children who entered the public school system in kindergarten were still enrolled at the end of the third grade; 71.3 percent

FIGURE 5.3  
Early Grade Enrollment Patterns  
1983 Cohort



of those entering in the first grade were still enrolled at the end of the third grade.

Rates at which pupils were held in grade were quite similar, with differences of less than one-half of one percent between the cohorts for kindergarten through second grade, although the holdover rate for kindergarten was only a fraction of that for first and second grades. Inter-cohort differences in the rates at which pupils left the school system were also very small.

Table 5.1 presents findings of the subsidiary study of special education pupils. Because of the ungraded structure of special education, it was not possible to create a flow chart for special education pupils as it was for those in general education. Very small percentages of pupils were assigned to special education between kindergarten and third grade. That no special education pupils were identified as having entered the public schools in the third grade was probably due the limited nature of the study, which stopped with the third-grade year; very few children entered the system directly into special education. There was a slight difference between the cohorts in the percentages of pupils assigned to special education.

The percentages of pupils included in the special education analysis who were still enrolled in the public schools in the third-grade year (or what would have been their third-grade year in general education terms), did not differ significantly by cohort. Among those who entered the public school system in kindergarten (including prekindergarten for the 1983 cohort), 89.9 percent from the 1982 cohort and 87.2 percent from the 1983

TABLE 5.1

Pupils Entering the New York City Public School System  
Who Were Assigned To Special Education At Some Point  
Between Kindergarten and Third Grade

Grade of Entry		N	Gen'l Ed. New Entrants	Pct Gen'l. Ed. New Entrants	Gen'l. Ed. Enrollment in Grade	Pct of Gen'l. Ed. Enrollment in Grade
1982 Cohort						
Kinder.		1846	45047	4.1%	45047	4.1%
1		606	13707	4.4	58631	1.0
2		34	2252	1.5	52621	0.6
1983 Cohort						
Kinder.		1735*	44556	3.7%	47584	3.6%*
1		351	9714	3.6	56891	0.6
2		---	----	---	-----	---

\* Includes children who entered kindergarten from Board of Education prekindergarten programs.

cohort<sup>3</sup> were still enrolled three years later. For those who entered the school system in the first grade, 91.7 percent from the 1982 cohort and 94.9 percent from the 1983 cohort were still enrolled two years later.

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<sup>3</sup> If pupils who entered the school system in prekindergarten are excluded, the figure was 84.3 percent for the 1983 cohort.

## VI. CONCLUSIONS AND RECOMMENDATIONS

No consistent meaningful differences in mean achievement were found between third graders who attended half-day kindergarten and those who attended all-day kindergarten. As with the second-grade evaluation, the prospective study found a slightly higher level of reading achievement among those pupils who attended half-day kindergarten than among those who attended all-day kindergarten. The retrospective study found that a marginally greater percentage of third graders who had attended all-day kindergarten were reading at or above grade level. The difference in outcomes was most likely due to sampling fluctuations. The third-grade follow-up of the city-wide study essentially replicated the finding of the previous year: Very little difference in reading levels between third graders who had attended half-day or all-day kindergarten but a quite considerable difference between those groups and third graders who had not attended public kindergarten, entering the school system from the first grade onward. The null findings do not mean that the lengthened school day of all-day kindergarten was without effect of any sort. Additional schooling afforded by all-day kindergarten may have had a short-term effect which evaporated by the end of the second grade or which was unmeasured by the evaluation.

The city-wide study also found that, if third-grade D.R.P. reading scores were converted to MAT equivalents, lower percentages of third graders were reading at or above grade level

than was the case for the same cohort at the end of the second grade. This finding was echoed by the prospective study, which found that third-grade MAT-equated median N.C.E.'s were lower than had been second-grade MAT N.C.E.'s.

The cohort study of enrollment and promotional patterns found a shift in enrollment with the advent of all-day kindergarten. Compared to the previous year, a substantially greater percentage of pupils entered the public school system in kindergarten in the first year all-day kindergarten was available, with a compensatory reduction of new entrants in first-grade. There were two other findings of note from the enrollment study: Approximately 72 percent of pupils who entered the public school system in kindergarten or first grade were still enrolled at the end of the third grade. Second, a cohort 'shrinks' after the first grade; holdovers and discharges from the system are not offset by new entrants.

While no final conclusions may be drawn from the studies in this report, several of the implications are unsettling. Close to 30 percent of the children who enter the public school system in kindergarten or first grade either will have left the system or been held back by the end of the third grade (and this excludes placements in special education). Another ten percent or so will have entered after the first grade. Third-grade reading achievement will be lower than second-grade reading achievement, if the reading tests are equated. All these suggest two things: A substantial proportion of third graders have not been exposed to the antecedents upon which the curriculum is built. Addition-

ally, early grade attrition may not be a statistically random event; it may be that the children who remain in the system are academically weaker than those who leave the system.

Recommendations from this study are as follows:

- \* City-wide all-day kindergarten should be continued. It has resulted in earlier enrollment in the New York City public schools of a substantial number of children, who would otherwise have entered the school system in the first grade.
- \* Children you enter the New York City public schools after kindergarten should be identified and provided with those educational experiences to which they were not exposed because of their late entry into the public school system.