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ABSTRACT

This dissertation report describes a 3-year study which compared the effectiveness of full-day kindergarten sessions (the experimental condition) and half-day sessions (the control condition) in promoting academic achievement. A group of 20 5-year-olds was assigned to each condition; each group contained equal numbers of culturally disadvantaged, economically disadvantaged and middle-class children. Readiness scores and achievement test scores for children in both groups were obtained at the beginning and end of the kindergarten year. Subsequent first grade placement and reading level attainments at the end of first grade were recorded. Results indicated that there was no statistically significant difference between full-day and half-day groups on any of these measures. When achievement test scores of the culturally disadvantaged were analyzed alone, there was still no statistically significant gain in achievement by the full-day over the half-day, indicating that the full-day program did not provide any special academic benefit to culturally disadvantaged children. It is suggested that on the basis of these results, the establishment of full-day kindergarten cannot be recommended on the grounds that it would measurably improve children's achievement. (Author/GO)

AN EXPERIMENTAL STUDY OF THE COMPARISON OF PUPIL ACHIEVEMENT IN THE ALL DAY KINDERGARTEN AND ONE HALF DAY CONTROL GROUP

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Purpose of the Study

Modern educational research has underscored the critical role of kindergarten education. But a basic disagreement has arisen over the full-day and the half-day kindergarten programs. Of the various innovations in kindergarten education, it would seem that the full-day program is one of the more significant, especially for children of economically or culturally disadvantaged parents. Yet this apparent advantage is questioned by some authorities and researchers.

The purpose of the present study was to present some findings relative to the educational effectiveness of full-day kindergarten sessions as compared to the half-day session.

Method of the Study

The study was carried out primarily in terms of an experimental research model. A three year study was begun in 1970 using kindergarten classes at Princess Anne Elementary School, Princess Anne, Maryland. Each year, data were recorded on an experimental full-day kindergarten group and a half-day control group in the form of readiness scores obtained in September and May and of achievement test scores obtained in May. Further data were obtained by recording subsequent first grade placement and reading level attainments of the experimental and control groups.

Findings, Conclusions, and Recommendations

The results of the study showed that even when cultural factors were considered, there was no statistically significant difference between the full-day experimental group and the half-day control group as measured by tests of readiness and achievement. Nor was there any significant difference between the two groups in subsequent first grade placement and reading level attainment one year later. On the basis of these results, it cannot be recommended that the full-day kindergarten be established on grounds of greater measurable academic achievement. However, because of the inconclusive and sometimes contradictory nature of research findings in this area, it is recommended that where measurable benefits resulting from a full-day kindergarten can be demonstrated, it should be seriously considered.

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CHAPTER I

INTRODUCTION

For more than a decade, educational research has underscored the critical importance of the early years in the later development of the individual. During these years more is learned at a faster rate than at any other time. Foundations are laid for the formation of long-lasting habits, attitudes, and intellectual competencies for what may become, virtually, a lifelong style of living and learning.

General consensus exists on the ultimate goal of education. Each individual, educators believe, should be able to fulfill his own potential and to become a productive member of society. This goal is especially difficult to attain for the children of those who are unable to provide the necessities for comfort, survival, self-respect, and self-esteem: all of them conditions essential to full participation in today's society.

> Children are considered disadvantaged indeed if they come from a family environment which militates against their capacity to learn. . . .At least 25 per cent of America's children are among the 30 million Americans who fall below the poverty line.[1]

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[1] U. S. Office of Education, PREP, A Readiness Test for Disadvantaged Preschool Children (Washington, D.C.: U. S. Department of Health, Education, and Welfare, n.d.), No. 22, p. 1.

Schools must be prepared to meet the needs of these children as well as of those of the great majority for whom the conditions of nature and nurture have been more favorable. Kindergarten education is an essential first step toward meeting these needs.

The Role of the Kindergarten

Traditionally, the formal education of children has begun at age six or seven in the United States; even today, compulsory attendance in school is not required in many states until the age of seven.[1] Kindergarten, thus, ranks generally as an informal, noncompulsory "pre-school" for most young people.

The earliest kinds of kindergartens were seen as an extension of child rearing. Early nineteenth century reformers such as Froebel felt that although mothers knew intuitively how to care properly for their young, they could not, without either further training or the help of a kindergarten, provide the experiences that would help children grasp the basic concepts that should be communicated symbolically to children at the earliest possible moment in their lives. In England, Rachel and Margaret McMillan fought to have the schools furnish baths, school dinners, and medical examinations and treatment for children who needed them. The McMillan sisters felt that "many of the problems observed in school-age children had their origins in their preschool years and could be prevented or more easily ameliorated with early care."[2]

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[1]Bernard Spodek, Early Childhood Education (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1973), p. 7.

[2]Ibid., p. 11.

Wills and Lindbert identified a number of trends in kindergarten programs.[1] Under the aegis of the individualized instruction movement, these researchers found, psychologists were giving emphasis to the idea that each child has a unique cognitive process or style of learning. Researchers and teachers were giving much attention to the development of perception. Other important areas of concern involved concept of self, encouragement of creativity, language development, and special methods kindergartens such as the Montessori.

The objectives of kindergarten vary, depending on how a particular school sees the needs of the child or the community. (See Appendix A, p. for a statement of the general objectives of the kindergarten program of Princess Anne Elementary School, Princess Anne, Maryland.) Individual needs vary, of necessity, and their solutions are synergistic; that is, in each solution there are dimensions of all the other solutions in an interactive and organic way. Moreover, it is unlikely that educational needs can be met without first meeting human needs.

> Objectives for any specific kindergarten situation can be set up only by those who know the needs of the children to be served, the community environment with its unique social problems, and the plant within which the kindergarten class will function.[2]

The Full-Day Kindergarten

While many kindergartens are scheduled for half-days, there are some school systems in which full-day programs have been developed.

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[1] Clarice Dechent Wills and Lucile Lindbert, Kindergarten for Today's Children (Chicago, Ill.: Follett Publishing Company, 1967), pp. 31-62.

[2] Ibid., p. 77.

The purposes of the full-day kindergarten have been well described:

> The full-day kindergarten provides opportunity for play out-of-doors both morning and afternoon, often a full hour of it during each period. The extended out-door play time makes it possible to make good use of large blocks and heavy pieces of equipment as well as sand piles. It provides important opportunities for boys and girls who come from a sterile home environment.[1]

Nonetheless, educators differ on the merits of the full-day program. Some contend that all young children need the six-hour school day while others deny that it is beneficial. In the latter group is Berson:

> I would prefer that all five-year-olds receive the challenge and stimulation of being in a school situation part of the day, and a rich home life the other part--the best of both worlds.[2]

The Problem

A major problem stems from this basic disagreement concerning the relative benefit of the full-day and the half-day kindergarten program. Of the various innovations in kindergarten education, it would seem that the full-day program is one of the more significant, especially for children of economically or culturally disadvantaged parents. Yet this apparent advantage is questioned by some authorities and researchers.

The problem of chief concern for this study can be stated in three parts:

1. Do full-day kindergarten groups achieve more than half-day groups?

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[1] Ibid., p. 43.

[2] Minnie Perrin Berson, "The All-Day Kindergarten," Today's Education, LVII (November, 1968), 28.

2. Do full-day kindergarten groups attain higher placement or reading levels than half-day groups in their subsequent first grade placement?

3. Is there any special benefit for culturally disadvantaged children in being given a full-day program instead of a half-day program?

Purpose of the Study

The purpose of the study reflects the questions raised in the statement of the problem. More specifically, the major purpose of this study was to present some findings relative to the educational effectiveness of full-day kindergarten sessions as compared to the half-day session. Evidence was to be compiled in two main ways: (1) an experimental study carried out over a three year period, and (2) a review of the literature having a direct or indirect bearing on the problem.

The Need for the Study

In recent years, there has been growing acceptance of the idea that some academic training should be started before first grade. Consequently, various readiness programs have gradually been worked into many kindergarten curricula. Some authorities feel that these programs are for the most part inadequate, and that the academic deficiencies could be remedied partly by the full-day kindergarten. There exists a need to evaluate the relative effectiveness of the

full-day programs as measured by various readiness and achievement tests scores.

Some nonacademic aspects of the problem also need to be studied. Among these are the growth patterns of the total child in relation to the social environment.

> What does the long day mean to the child? The parent? The teacher? In our social planning, we must consider the consequences of long hours of group day care.[1]

Limitations of the Study

The study was designed with some limitations in mind. Most importantly, the study deals primarily with achievement and academic grade placement. The data considered do not reveal possible social or psychological gains that do not lend themselves to easy measurement; that is, the study was not conceived as a total assessment of the developing child. Even if it could be assumed that no bias exists in the statistical methods used, or in the measurements and ratings assigned to individuals, the whole child has not been measured. A relatively more comprehensive study would include an assessment and evaluation of perceptual growth, bodily functions, social relationships, memory and imitative skills, and manipulative and motor abilities.

Assumptions

For the purposes of the current study, some basic assumptions have been made:

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[1] Eleanor M. Hosley, "The Long Day," Young Children, XX (January, 1965), 135.

1. That there is a genuine need for kindergarten classes, and that the need is being met on a widespread basis in school systems throughout the United States.

2. That trends have developed in kindergarten theory and practice, and that, at least to some extent, divergent trends are substantiated by conflicting views on the merits of the full-day kindergarten as opposed to the half-day.

3. That research may lead in time to crystallization of opinion on the merits and disadvantages of one type of kindergarten or the other.

To the greatest degree possible, the review of the literature was to provide a basis for validation of the assumptions.

Definitions

The current study utilizes a number of technical terms, including the following:

Cognitive curriculum: A curriculum that focuses primarily on the intellectual, or cognitive, development of the child.

Culturally disadvantaged: Pupils who lack opportunitites for varied experiences, intellectual stimulation, and language development.

Economically disadvantaged: Pupils who are isolated from the mainstream of society by poverty.

Full-day kindergarten: A kindergarten class arrangement under which a class group meets for a full school day from approximately 9:00 A.M. to 3:00 P.M. or 3:15 P.M.

Half-day kindergarten: A kindergarten class that meets for half a school day from approximately 9:00 A.M. to 11:30 A.M.

Middle class: Pupils from families of average income which include both blue collar workers and professionals who have had varied experiences.

Total assessment: An evaluation of an individual which takes into consideration the total needs of a child and his or her environment, not just cognitive development.

Hypothesis

The main hypothesis of the study can be stated as follows: There is a significant difference in the achievement of full-day kindergarten groups and half-day kindergarten groups as measured by suitable tests.

This hypothesis will be tested statistically in regard to middle class and culturally disadvantaged subgroups as well as to the experimental and control groups of the study. The hypothesis will also be tested informally by comparing subsequent first grade placement and reading level achievement of the experimental and control groups in the study.

Procedure

The study has been designed in such a way that reliable and valid statistical data will provide the base for findings.

Study Design

The study was carried out primarily in terms of an experimental research model.

In 1970 two kindergarten classes at Princess Anne Elementary School, Princess Anne, Maryland were selected as (1) a full-day experimental and (2) a half-day control group. The experimental group met for a full school day from 9:00 A.M. to 3:15 P.M. and the control group met for half a school day, from 9:00 A.M. to 11:30 A.M. Each class was limited to twenty pupils chosen from a population of ninety to ninety-five kindergarten children. Each group was chosen so as to contain only five year olds--ten boys and ten girls, ten blacks and ten whites, and with an equal distribution of economically disadvantaged, culturally disadvantaged, and middle class children. The two teachers assigned to these groups were female, with the same degree status and of the same age. The classroom atmosphere, teaching and play materials, schedule, and motivation were made as nearly alike as possible. The basic curriculum for each group was the same, with the full-day group receiving more enrichment and/or reinforcement in the followup activities. (See Appendix B, p. 55, for components of the curriculum and enrichment and/or reinforcement in the individualized instruction of followup activities.) The experiment covered a period of three years, with the model being repeated in 1971 and again in 1972.

Data Collection

The experimental and control groups were each tested three times. In September of three successive years, both groups were given

the Walker Readiness Test, or "PREP", a testing program for disadvantaged children.[1] In the following May for each year of the three year period, each group was given the Stanford Early School Achievement Test.[2] The results were tabulated in terms of raw scores and the following null hypothesis was tested: that there is no statistically significant difference between mean test scores of the experimental and control groups.

The null hypothesis was tested by means for t-tests at the .01 level of significance and through analysis of variance at the .05 level of significance.

Also collected were data on the experimental and control groups' subsequent placement in first grade and reading levels attained; comparisons of differences were made.

Organization of the Study

Chapter I has served as an introduction to the study. Chapter II contains a review of the relevant literature. Chapter III forms a summary of the data obtained from the experimental study. Chapter IV analyzes the data of Chapter III, and in Chapter V, findings, recommendations, and conclusions are presented.

Summary

Because early years are of critical importance to the later development of an individual, kindergarten experience has been seen

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[1] U. S. Office of Education, DHEW, PREP, A Readiness Test for Disadvantaged Children.

[2] Richard Madden and Eric F. Gardner, Stanford Early School Achievement Test (New York: Harcourt Brace and World, Inc., 1969).

as necessary and crucial. The question naturally arises as to whether there are significant gains for those attending a full-day kindergarten. Of special interest was the possibility that the culturally disadvantaged might be especially helped through a full-day program.

To shed some light on the basic problem, a three year study was begun in 1970 using kindergarten classes at Princess Anne Elementary School, Princess Anne, Maryland. Each year, data were recorded on an experimental full-day kindergarten group and a half-day control group in the form of readiness scores obtained in September and May and of achievement test scores obtained in May. Further data were obtained by recording subsequent first grade placement and reading level attainments of the experimental and control groups.

The results of an in-depth review of the literature and the results and analysis of the experimental tests are presented in subsequent chapters. The concluding chapter contains a summary of the study's findings, recommendations, and conclusions.

CHAPTER II

REVIEW OF THE LITERATURE AND RESEARCH

An abundance of literature touches directly or indirectly on the subject of pupil achievement in relation to the length of the school day. Research studies have also been conducted to investigate the general subject area. In recent years the topic has been extensively debated, with special emphasis on the relative merits of a full-day kindergarten session in comparison to a half-day session.

A number of facets of the subject have been explored. For the purpose of this study, the literature and research may best be discussed under three headings: (1) the history of the kindergarten movement, (2) the need for kindergartens, and (3) the relation between the length of school day and achievement. Discussion of the latter point will focus on the controversy involving the full-day and the half-day kindergarten session.

The Kindergarten Movement

The modern American kindergarten movement has its roots in European reforms dating back to the eighteenth century. Best known of the European reformers are Froebel, Pestalozzi, and Madame Montessori.

Froebel and Pestalozzi felt that education could--and should, as far as possible--grow out of real-life experience. Froebel (1782-1852) was convinced that education should serve to develop the whole child--physically, morally, and intellectually.

> He also went along with other thinkers in maintaining that educational experience should be adapted to the child's level of maturity and he strongly felt that each step or experience should in some way grow out of, or tie in with, earlier experiences. Froebel and Pestalozzi conceived the ideal classroom as reflecting both the physical qualities and the atmosphere of a pleasant home situation.[1]

Both Montessori (1870-1952) and Froebel defended the child's right to develop his own resources through exploration of his environment, a view consistent with Piaget's theory of cognitive development. Sense training, bodily activity, and social development were concerns of both Froebel and Montessori; but each had his own method and design for the provision of fulfilling experiences. Although Froebel's thoughts were revolutionary for his time, his methods of guidance fell within a traditional pattern of schooling. His "gifts"--blocks and other forms to be used in instruction--were to be handled by children in a limited and formalized manner. Even so:

> The findings of child-development studies since his time indicate that methods other than those used by Froebel may well serve his aims more effectively.[2]

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[1] Neith Headley, The Kindergarten: Its Place in the Program of Education (New York: The Center for Applied Research in Education, Inc., 1965), p. 3.

[2] National Education Association, Kindergarten Practices, 1961, Research Monograph 1962-M2 (Washington, D.C.: Research Division--National Education Association, 1962), p. 5.

In 1856, the first kindergarten in America was established in Watertown, Wisconsin, by Mrs. Carl Schurz, a German immigrant. Other kindergartens appeared as educators took note of the Wisconsin experiment.

> Under Mrs. Schurz's influence, Elizabeth Palmer Peabody opened a kindergarten in Boston in 1860, the first kindergarten in America for English-speaking children. In 1873, kindergartens became part of the public-school system of St. Louis, Missouri, and the movement spread from there, beginning usually in the larger cities through the work of indefatigable advocates of the kindergarten cause.[1]

By the middle of the twentieth century, kindergartens were common. In 1958, about 53 per cent of the five-year olds in the United States had the opportunity to attend public kindergartens.[2] By 1969, one-year kindergarten programs were scheduled by an estimated 92 per cent of the total elementary school systems in America.[3]

The 1960's and early 1970's saw unprecedented growth of early childhood education in the United States. Enrollment in nursery school and kindergarten classes increased significantly. In addition to the fact that there are more services for younger children, the services that are being provided are different from the ones offered a decade or two earlier.

> One trend is toward a decrease in the size of groups of children: another is the mixing of ages within groups. In addition, more programs are making an effort to reach the

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[1] Ibid., p. 5.

[2] Neith Headley, The Kindergarten: Its Place in the Program of Education, p. 20.

[3] National Education Association, Kindergarten Education in Public Schools, Research Report 1969-R6 (Washington, D.C.: Research Division--National Education Association), p. 5.

> parents of young children and to involve them in the educative process. More and more programs, including those for the poor, now require that the professional meet with parents to identify the needs of the child through dialogue.[1]

The Need for Kindergartens

The need for modern kindergartens is hardly questioned today. Consensus on that score has been widespread. Many authorities on the subject feel that the time has come to seek a new direction in kindergarten education, and that "too few children are being prepared to cope with an increasingly technical and complex society."[2] Thus, at a time when individual competitiveness is being transferred progressively from the economic to the educational world and from the office or workshop to the school and university, it is more and more seen as ". . . vital that we should offer all children the opportunity to develop their abilities and aptitudes to the full."[3]

Authorities such as Levinger and Murphy saw the school as a place in which there is an opportunity to correct some of the distortions which may have developed in infancy and later: practices such as excessively rigid feeding and toilet training, excessively cold or excessively sentimental handling by mothers, and excessive competition with a sibling. Other distortions may have their genesis in a particular environment:

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[1] Bernard Spodek, Early Childhood Education (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1973), p. 3.

[2] Helen F. Robison and Bernard Spodek, New Directions in the Kindergarten (New York: Columbia University Teachers College Press, Teachers College, 1965), p. 1.

[3] J. W. B. Douglas, The Home and the School (London: MacGibbon & Kee, 1966), p. 1.

> City children, as we have said, living in confined apartments need to see, feel, and touch grass, animals, and flowers. Watching a turtle creep across a table can elicit delighted squeals from the children. A sweet-potato plant, putting out more and more leaves, is enthralling. Even a walk in a city park is important to the children.[1]

Kindergarten may correct specific educational deficiencies as well. Goodykoontz, Davis, and Gabbard, for example, held that,

> With the policy of 'hands off' until six, the child's haphazard education at home often leaves him unable to make the most of the later educational opportunities which are offered.[2]

It should be noted, finally, that kindergarten is seen by various authorities as a means of preparing millions of young children from poor and underprivileged home environments to "break the poverty cycle of lack of training, unemployment, ignorance, and fear."[3]

The Shortened Daily School Session

A number of studies have agreed in favor of shortened daily school sessions. Jacka found that seventh and eighth graders attending a shortened session did not significantly change as regards

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[1]Leah Levinger and Lois Barclay Murphy, "Implications of the Social Scene for the Education of Young Children," The Forty-Sixth Yearbook of the National Society for the Study of Education, Part II (Chicago, Ill.: The University of Chicago Press, 1948), p. 37.

[2]Bess Goodykoontz, Mary Darney Davis, and Hazel F. Gabbard, "Recent History and Present Status of Education for Young Children," The Forty-Sixth Yearbook of the National Society for the Study of Education, Part II, p. 51.

[3]Emmy Louise Widmer, The Critical Years: Early Childhood Education at the Crossroads (Scranton, Pa.: International Textbook Co., 1970), p. 3.

academic achievement.[1] In a study of the academic performance of first grade students, Archambault and Paulus reached a similar conclusion. "Children can be excused from a considerable portion of the school day," these researchers wrote, "without loss in basic academic areas."[2]

On the other hand, a number of studies have voiced an opposition to the shortened daily session. Schultz, Kropp, and Curtis concluded that "pupils who remain in half-day session classes beyond the primary grades fall behind pupils who attend regular session classes."[3] Similarly, some authorities have felt that in half-day school sessions such activities as music, art, and physical education are eliminated or greatly reduced, and that therefore pupils lose much of educational value. "The inability to measure social and cultural factors is a great detriment in measuring the efficiency or the inefficiency of half-day sessions."[4]

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[1]John McClellan Jacka, "The Effect of Shortened Daily School Sessions on Achievement in Grades Seven and Eight," Dissertation Abstracts, XXVI (1965-1966), 906.

[2]Francis X. Archambault, Jr. and Dieter H. Paulus, "An Empirical Investigation of a Compact School Day for First-Grade Children," Psychology in the Schools, IX (January, 1972), 7.

[3]R. E. Schultz, R. P. Kropp, and H. A. Curtis, "A Comparison of Half-Day and Regular Session Pupil Achievement in Elementary Schools," Childhood Education, XXXIV (May, 1958), 426.

[4]Billie Hollingshead, "An Evaluation of Half-Day and Full-Day Sessions in the First Two Grades," The Elementary School Journal, XXXIX (January, 1939), 370.

Despite arguments in favor of the shortened school day, in the period 1960-65 it was estimated that only 2.2 per cent of the public school systems reduced the amount of time in the school day.[1]

A number of studies cite data and opinion in behalf of the full-day kindergarten session. Gorton, joining others, stated that "Most educators contacted in a survey indicated a feeling that educational benefits would result from a full-day kindergarten."[2] Goldstein and Chorost found that "those with either nursery school or kindergarten experience obtained higher scores in logical reasoning and total non-language intelligence."[3] Gilstrap, Douthat, and Guenther pointed out that numerous studies have compared the achievement in first grade of children who attended kindergarten with the achievement of those who did not. "While some of the studies are inconclusive, much of the research favors children with kindergarten experience."[4]

However, as Goldstein and Chorost have also noted, such measurable differences disappeared in the second and third grades, suggesting that, without preschooling, perhaps basic intellectual abilities are initially dulled, but later reclaimed.[5]

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[1]National Education Association, "Length of School Year and School Day," National Education Association Research Bulletin, XLIII (December, 1965), 103-105.

[2]Harry B. Gorton, "For Better Results--A Full-Day Kindergarten," Education, LXXXIX (February, 1969), 20.

[3]U. S. Deparment of Health, Education, and Welfare, Office of Education, "A Preliminary Evaluation of Nursery School Experience on the Later School Adjustment of Culturally Disadvantaged Children," by Kenneth M. Goldstein and Sherwood B. Chorost, Cooperative Research Project No. S-323 (Washington, D.C.: HEW, Office of Education, 1966), p. 20.

[4]Robert Gilstrap, Eleanor L. Douthat, and Annette Guenther, "Some Questions and Answers, Early Childhood Education," Today's Education, LIX (April, 1970), 40.

[5]U. S. Department of Health, Education, and Welfare, Office of Education, "A Preliminary Evaluation," p. 20.

The Full-Day Kindergarten

Of those school systems that have kindergartens, only about ten per cent offer full-day kindergarten sessions. Thus the vast majority of kindergartens are run on a half-day basis.[1] Numerous studies bear on the issue of full-day versus half-day kindergarten sessions, and will be discussed here in terms of compensatory education and psychological and social effects.

Compensatory Education

Many authorities have advocated the full-day kindergarten as a form of compensatory education. However, a number of researchers have challenged the assumed differences between kindergarten children from diverse socioeconomic classes. Regarding growth measurements between middle class and lower class kindergarten children, a study by Jones, for example, showed that "there is little difference between the response of the middle and lower class children."[2] Corroboratively, Kunz and Moyer found no significant differences in economically advantaged and disadvantaged kindergarten children in reference to physical or problem solving skills;[3] and in a study of the abilities

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[1] National Education Association, Kindergarten Education in Public Schools, Research Report 1969-R6, p. 5.

[2] Lethonee Hendricks Jones, "Intervention the Preschool Experience: A Descriptive Study of Growth in One Group of Children at Chase House and Factors Related to Their Chance," Master's Thesis, Jane Addams Graduate School of Social Work of the University of Illinois, Chicago, 1969, p. 64.

[3] Jean Kunz and Joan E. Moyer, "A Comparison of Economically Disadvantaged and Economically Advantaged Kindergarten Children," The Journal of Educational Research, LXII (May-June, 1969), 39.

of low socioeconomic black and white kindergarten children, Musgrove found no significant difference.[1]

Yet other research has appeared to controvert such findings. Ryckman found a significant difference between middle and lower class black kindergarten boys in regard to language ability.[2] A number of authorities have also pointed out that traditional curriculum concepts do not always meet the needs of culturally deprived children, for whom a special curriculum might be advisable.[3] "In general," wrote Vane, "the common practice of grouping all disadvantaged children in one category (lower class) masks differences in socioeconomic background that affect the children's school performance."[4]

Psychological and Social Effects

Many factors in modern society make it possible for children to know more today at an earlier age. Wann, Dorn, and Liddle found that children were eager to gather information and "to see relationships, to make generalizations, to discriminate, to classify."[5] Bruner, a widely

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[1] Walter J. Musgrove, "Comparison of Low Socioeconomic Black and White Kindergarten Children," Academic Therapy, VI (Winter, 1970), 163-167.

[2] David B. Ryckman, "A Comparison of Information Processing Abilities of Middle and Lower Class Negro Kindergarten Boys," Exceptional Children, XXXIII (April, 1967), 145-152.

[3] James L. Olson and Richard G. Larson, "Culturally Deprived Kindergarten Children," Educational Leadership, XXII (May, 1965), 553.

[4] Julia R. Vane, "Importance of Considering Background Factors When Evaluating the Effects of Compensatory Education Programs Designed for Young Children," Journal of School Psychology, IX (Winter, 1971), 397.

[5] Kenneth D. Wann, Miriam Selchen Dorn, and Elizabeth Ann Liddle, Fostering Intellectual Development in Young Children (New York: Teachers College Press, Teachers College, Columbia University, 1962), p. 98.

respected authority, felt that "intellectual activity anywhere is the same, whether at the frontier of knowledge or in a third-grade classroom. The difference is in degree, not in kind."[1]

Other authorities have suggested that the full-day kindergarten might be too much, too soon. Heffernan, for one, warned against confusing "can" with "should" and "warping children to please parents" through premature pressure for achievement.[2] Fisher argued for preservation of "the rights of young children to childhood" and warned against "the cultural imperatives for early academic learning."[3]

Hunt, among others, has pioneered extensively in studies of compensatory education and has provided a basis for its development. In his research regarding intelligence and the experience of the child, he pointed to the crucial early years and their role in development of ability to think and generalize. His work Intelligence and Experience depicts the human being as highly flexible in a life experience that has a major impact on the development of intellectual functioning.[4] Reasoning along similar lines, Kirk demonstrated that pre-school experiences that promote understanding and wide use of language result in greater success in later years in school.[5]

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[1]Jerome S. Bruner, The Process of Education (Cambridge: Harvard University Press, 1961), p. 14.

[2]Helen Heffernan, "What is Good Education in Nursery School and Kindergarten?", Childhood Education, XLI (September, 1964), 28.

[3]Robert J. Fisher, "Assault Upon the Young," Early Childhood, Crucial Years for Learning, Reprints from Childhood Education (Washington, D.C.: Association for Childhood Education International, 1966), p. 66.

[4]J. McVicker Hunt, Intelligence and Experience (New York: The Roland Press Co., 1961).

[5]Samuel A. Kirk, Early Education of the Mentally Retarded (Urbana, Ill.: University of Illionis Press, 1958).

Two schools of psychologists have been relied upon for support of early academic experiences: Jean Piaget and B. F. Skinner are the seminal writers for these schools. While the theories of these two schools are divergent and conflict with each other, their followers have found in their work the basis for the "open classroom" and the classroom structured as required by one or another form of behavior modification or programmed learning. Piaget's developmental theories tend to lead to informal and "unstructured" settings wherein logical or "thinking skills" are fostered, at least initially, through manipulative and other similar experiences. Skinner's theory on the other hand tends to lead to approaches such as that of Bereiter and Englemann, an approach that is frequently highly structured and with emphasis on acquisition of pre-determined pieces of information and knowledge and pre-determined and discrete cognitive skills.[1]

As might be expected, these theories also lead to differences in views toward language, language acquisition, and reading. Skinner, for instance, views language acquisition as involving imitation motivated by identifiable reinforcement schedules. While Piaget does not present a fully articulated theory of language and language acquisition, it appears that his theory is allied, in some ways, with that of Chomksy and his followers, a theory that seems to imply that linguistic performance develops not through imitation and reinforces, but through activation of all ready existing competence through participation in various forms of social and environmental interaction.

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[1]B. F. Skinner, Verbal Behavior (New York: Appleton-Century-Crofts, Inc., 1957).

Whatever the merits of the competing theoretical and practical claims put forth by these schools of psychology, each theory offers a rationale for early education and for attention to language. In the case of Piagetians, early experiences are seen as promoting the developmental process which may be inhibited by some social and environmental settings. And for the Skinnerians early schooling experiences correctly structured can provide both the knowledge and skill base necessary to academic competition and success in later years. Finally, whichever theory one accepts, both would seem to lead to a conclusion that length of time spent in appropriate learning settings would yield more "development" in cognitive areas or more acquisition of "skills" and "knowledge."

Summary

The majority of studies indicate that kindergarten does have a positive effect on later school achievement, that the kindergarten year is an ideal time to identify, to predict, and to prevent future learning handicaps. Research suggests that beginning reading, writing, and arithmetic experience can be a part of the kindergarten program, although researchers are not in agreement as to how these skills should be taught: whether through formalized drill and direct teaching or through an individualized experience approach. Although research is by no means conclusive, and is indeed at variance in many cases, there is sufficient evidence to suggest that a properly designed full-day kindergarten program can improve achievement and serve as a form of compensatory education. However, as authorities generally concede, possible psychological and social effects should be carefully considered as well as the measurable gains to be achieved in kindergarten.

CHAPTER III

RESULTS

The results of this experimental study consisted of data obtained from kindergarten classes at Princess Anne Elementary School, Princess Anne, Maryland. In 1970 two kindergarten classes of twenty pupils each were assigned to an all-day experimental group and a half-day control group respectively. The children were chosen on the basis of (1) conferences with parents, social workers, and school nurses; (2) visitations to the homes of children in order to determine their home backgrounds, and (3) evaluations of the children by the school principal and by the county supervisor of instruction using pre-test information. The composition of both groups is shown in Table 1.

This selection procedure was repeated in 1971 and again in 1972. The purpose of the experimental study was to determine whether the whole-day and half-day kindergarten groups differed significantly in achievement. The results are summarized in the following sections.

Test Results

All experimental and control groups were given three tests: (1) a pre-test in September consisting of the "PREP" Walker Readiness Test; (2) a post-test in May consisting of the "PREP" Walker Readiness Test, and (3) an achievement test in May consisting of the Stanford Early School Achievement Test.

TABLE 1

COMPOSITION OF EXPERIMENTAL AND CONTROL GROUPS
BY AGE, SEX, RACE, AND
HOME BACKGROUND

Student	Sex	Age	Race	Home Background
1	F	5	Black	Culturally disadvantaged
2	F	5	Black	Middle class
3	F	5	Black	Economically disadvantaged
4	F	5	Black	Culturally disadvantaged
5	F	5	Black	Middle class
6	F	5	White	Economically disadvantaged
7	F	5	White	Middle class
8	F	5	White	Culturally disadvantaged
9	F	5	White	Middle class
10	F	5	White	Economically disadvantaged
11	M	5	Black	Economically disadvantaged
12	M	5	Black	Culturally disadvantaged
13	M	5	Black	Culturally disadvantaged
14	M	5	Black	Middle class
15	M	5	Black	Economically disadvantaged
16	M	5	White	Culturally disadvantaged
17	M	5	White	Middle class
18	M	5	White	Middle class
19	M	5	White	Economically disadvantaged
20	M	5	White	Culturally disadvantaged

Readiness Test Scores

The readiness test scores covered a three year period. They are shown in Tables 2 through 4.

TABLE 2

RESULTS OF READINESS PRE-TEST AND POST-TEST: 1970-71

	Experimental Group		Control Group	
Student	Pre-Test	Post-Test	Pre-Test	Post-Test
1	49	50	45	49
2	49	50	44	49
3	45	49	43	49
4	45	48	42	46
5	43	47	42	45
6	42	46	40	47
7	42	47	40	45
8	42	48	40	44
9	41	47	39	42
10	41	48	39	41
11	40	45	38	40
12	35	40	36	41
13	32	39	34	39
14	32	41	33	36
15	30	42	30	35
16	30	45	26	34
17	25	35	25	35
18	24	40	23	32
19	22	39	22	30
20	20	38	19	32

TABLE 3

RESULTS OF READINESS PRE-TEST AND POST-TEST: 1971-72

	Experimental Group		Control Group	
Student	Pre-Test	Post-Test	Pre-Test	Post-Test
1	47	49	48	50
2	46	48	48	49
3	44	48	40	47
4	42	48	40	46
5	39	50	33	48
6	39	47	33	45
7	37	48	30	44
8	36	47	30	43
9	36	45	29	47
10	32	46	27	28
11	31	44	26	43
12	27	45	23	44
13	27	45	23	32
14	26	46	22	44
15	26	49	18	47
16	25	41	17	40
17	24	40	17	42
18	22	40	17	42
19	19	45	17	34
20	16	40	14	42

TABLE 4

RESULTS OF READINESS PRE-TEST AND POST-TEST: 1972-73

	Experimental Group		Control Group	
Student	Pre-Test	Post-Test	Pre-Test	Post-Test
1	47	50	48	48
2	44	50	48	46
3	43	48	47	46
4	39	49	46	48
5	39	43	45	44
6	37	47	44	43
7	36	48	43	49
8	34	46	43	45
9	34	44	38	47
10	33	46	38	47
11	32	47	36	42
12	31	46	34	50
13	30	43	33	50
14	29	41	33	41
15	26	48	32	46
16	24	44	32	41
17	24	35	22	40
18	21	40	18	33
19	18	34	15	33
20	18	32	10	33

Achievement Test Scores

The achievement test scores also covered a three year period and are shown in Tables 5 through 7.

TABLE 5

RESULTS OF ACHIEVEMENT TEST: 1970-71

Student	Experimental Group	Control Group
1	120	126
2	119	124
3	118	117
4	117	117
5	116	117
6	116	116
7	113	115
8	113	114
9	110	113
10	107	107
11	107	107
12	106	101
13	100	94
14	100	89
15	93	85
16	88	84
17	82	82
18	81	75
19	80	68
20	77	63

TABLE 6

RESULTS OF ACHIEVEMENT TEST: 1971-72

Student	Experimental Group	Control Group
1	121	119
2	119	119
3	117	117
4	112	110
5	110	110
6	108	107
7	106	105
8	104	94
9	103	91
10	98	90
11	98	90
12	96	83
13	93	83
14	89	81
15	84	79
16	78	78
17	77	74
18	73	69
19	68	68
20	68	55

TABLE 7

RESULTS OF ACHIEVEMENT TEST: 1972-73

Student	Experimental Group	Control Group
1	120	113
2	117	108
3	116	107
4	114	106
5	114	103
6	112	102
7	108	101
8	105	97
9	105	96
10	105	94
11	104	94
12	99	88
13	91	88
14	89	85
15	89	84
16	89	72
17	86	72
18	84	70
19	73	69
20	69	64

First Grade Placement and Reading Achievement

The research also sought data on the experimental and control groups. The purpose was to show how these groups were placed in first grade and what their reading achievement level was at the completion of first grade. First grade placement was in terms of learning ability designated by Section A (highest), Section B (intermediate), and Section C (lowest). Reading achievement levels ranged from 1 through 6, with each successive number designating a progressively higher reading level. The data are shown in Tables 8 through 10. Each of the three tables is accompanied by a summary.

The data in Tables 1 through 10 are analyzed in Chapter IV of this study.

Reading placement and achievement levels of first grade pupils were determined by previous test scores, teacher's recommendations, daily skill records kept in folders for each child, observations made by the school principal, and observations made during the previous school year by the supervisor of instruction of Somerset County.

The primary teachers at Princess Anne Elementary School were aware of the experiment and its design. They were included in all meetings and planning sessions for the kindergarten curriculum and followup activities. All first grade teachers were involved in weekly planning of kindergarten activities that were designed to develop skills and the experiential background on which a program could be built in later years. Such interrelatedness between various grade levels represents curriculum integration on a vertical basis.

TABLE 8

FIRST GRADE PLACEMENT AND READING ACHIEVEMENT: 1971-72

Student	Experimental Group		Control Group	
	Section	Level	Section	Level
1	A	5	A	5
2	A	5	A	5
3	A	5	A	5
4	A	5	A	5
5	A	5	A	5
6	A	5	A	5
7	A	5	A	5
8	A	5	A	5
9	A	5	A	5
10	A	5	A	5
11	A	5	A	5
12	A	5	A	5
13	B	5	B	5
14	B	5	B	5
15	B	5	B	5
16	B	5	B	5
17	C	4	C	4
18	C	4	C	4
19	C	4	C	4
20	C	4	C	4

Summary

		Experimental	Control
Section	A	12	12
	B	4	4
	C	4	4
Level	4	4	4
	5	16	16

TABLE 9

FIRST GRADE PLACEMENT AND READING ACHIEVEMENT: 1972-73

Student	Experimental Group		Control Group	
	Section	Level	Section	Level
1	A	5	A	5
2	A	5	A	5
3	A	5	A	5
4	A	5	A	5
5	A	5	A	5
6	A	5	A	5
7	B	5	B	5
8	B	5	B	5
9	B	5	B	5
10	B	5	B	5
11	B	5	B	5
12	B	5	C	4
13	B	5	C	4
14	B	5	C	4
15	C	4	C	4
16	C	4	C	4
17	C	4	C	4
18	C	4	C	4
19	C	4	C	4
20	C	4	C	4

Summary

		Experimental	Control
Section	A	6	6
	B	8	5
	C	6	9
Level	4	6	9
	5	14	11

TABLE 10

FIRST GRADE PLACEMENT AND READING ACHIEVEMENT: 1973-74

	Experimental Group		Control Group	
Student	Section	Level	Section	Level
1	A	6	A	6
2	A	6	A	6
3	A	6	A	6
4	A	6	B	6
5	A	6	B	6
6	A	6	B	5
7	A	6	B	5
8	B	5	B	5
9	B	5	B	5
10	B	5	B	5
11	B	5	B	5
12	B	5	B	5
13	B	5	B	5
14	B	5	C	4
15	B	5	C	4
16	B	5	C	4
17	B	5	C	4
18	C	4	C	4
19	C	4	C	4
20	C	4	C	4

Summary

		Experimental	Control
Section	A	7	3
	B	10	10
	C	3	7
Level	4	3	7
	5	10	8
	6	7	5

The teachers in the school were thus involved in an effective working relationship. This was possible partly because the kindergarten and primary teachers shared a common philosophy and an openness toward experimentation. Through participation in a well planned curriculum sequence, each child was given a feeling of greater confidence and success in the school setting.

CHAPTER IV

ANALYSIS OF RESULTS

In terms of various measures of achievement, it would seem natural that pupils in an all-day kindergarten groups would show more progress than the pupils in a half-day kindergarten. However, the results of this study show that even when cultural factors were considered, there was no statistically significant difference between the two groups as measured by tests of readiness and achievement. Nor was there any significant difference between the two groups in subsequent first grade placement and reading level attainment one year later. This finding is borne out by analysis of the test scores through use of the statistical t test and analysis of variance.

Analysis of Readiness Scores

Tables 2 through 4 in Chapter III show the readiness scores of the experimental and control groups obtained over a three year period. Tables 11 through 13 show the readiness score gains--determined by subtracting the pre-test scores from the post-test scores--of these groups over the same three year period. To determine whether or not the gains made by the experimental group were significantly different

from those made by the control group, a t test was performed for each of the three experiments.[1]

The t Test

The following standard steps were performed in carrying out the t test.

1. Assertion of the null hypothesis: the mean readiness scores of the two theoretical populations from which the experimental and control groups were drawn were equal. Put another way, there is no statistically significant difference between the mean score of the experimental group and the mean score of the control group.

2. Establishment of the chance of statistical error in testing the null hypothesis at .01; or, equivalently, choosing a .01 level of significance.

3. Assumption that both theoretical populations were normally distributed and with the same mean and the same variance, and definition of the statistic t (where $df = N_e + N_c - 2$) as follows:

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[1] It should be specified that the notation used in the t test is as follows:

X_e = the score of a subject in the experimental group
X_c = the score of a subject in the control group
N_e = the number of subjects in the experimental group
N_c = the number of subjects in the control group
M_e = the mean score of the experimental group
M_c = the mean score of the control group
df = degrees of freedom
S_e^2 = the variance within the experimental group
S_c^2 = the variance within the control group
S_p^2 = the pooled variance of the two groups.

$$t = \frac{M_e - M_c}{S_p \sqrt{1/N_e + 1/N_c}}$$

where

$$S_p^2 = \frac{S_e^2 + S_c^2}{N_e + N_c - 2}$$

$$S_e^2 = \sum X_e^2 - \frac{(\Sigma X_e)^2}{N_e}$$

$$S_c^2 = \sum X_c^2 - \frac{(\Sigma X_c)^2}{N_c}$$

4. If $-2.712 < t < 2.712$, the null hypothesis is accepted at the .01 level of significance. If $t > 2.712$ or if $t < -.712$, the null hypothesis must be rejected.

The results of the t tests for the 1970-71 school year are shown in Table 11. On the basis of these results, it follows that the null hypothesis is accepted at the .01 level of significance. No significant difference was found in the readiness scores of the experimental and control groups for the 1970-71 period.

TABLE 11

ANALYSIS OF READINESS SCORES FOR EXPERIMENTAL AND CONTROL GROUPS: 1970-71*

	Experimental Group		Control Group	
Student	gain	$gain^2$	gain	$gain^2$
1	1	1	4	16
2	1	1	5	25
3	4	16	6	36
4	3	9	4	16
5	4	16	3	9
6	4	16	7	49
7	5	25	5	25
8	6	36	4	16
9	6	36	3	9
10	7	49	2	4
11	5	25	2	4
12	5	25	5	25
13	7	49	5	25
14	9	81	3	9
15	12	144	5	25
16	15	225	8	64
17	10	100	10	100
18	16	256	9	81
19	17	289	8	64
20	18	324	13	169
Sum	155	1723	111	771
Mean	7.75		5.55	

$$S_e^2 = 1723 - \frac{155^2}{20} = 521.8 \qquad S_c^2 = 771 - \frac{111^2}{20} = 154.9$$

$$S_p^2 = \frac{521.8 + 154.9}{38} = 17.81 \qquad S_p = \sqrt{17.81} = 4.22$$

$$\sqrt{1/20 + 1/20} = \sqrt{1/10} = .316$$

$$*t = \frac{7.75 - 5.55}{4.22(.316)} = 1.654$$

The results of the t tests for the 1971-72 school year are shown in Table 12. Again, the null hypothesis is accepted at the .01 level of significance. Thus, there was no significant difference between the readiness scores for the experimental and control groups for the 1971-72 period.

TABLE 12

ANALYSIS OF READINESS SCORES FOR EXPERIMENTAL AND CONTROL GROUPS: 1971-72*

	Experimental Group		Control Group	
Student	gain	gain^2	gain	gain^2
1	2	4	2	4
2	2	4	1	1
3	4	16	7	49
4	6	36	6	36
5	11	121	15	225
6	8	64	12	144
7	11	121	14	196
8	11	121	13	169
9	9	81	18	324
10	16	256	1	1
11	13	169	17	289
12	18	324	21	441
13	18	324	9	81
14	20	400	22	484
15	23	529	29	841
16	16	256	23	529
17	16	256	25	625
18	18	324	25	625
19	26	676	17	289
20	24	576	28	784
Sum	272	4658	305	6137
Mean	13.5		15.25	

*$t = \frac{13.5 - 15.25}{8.07(.316)} = .686$, which is not significant at the .01 level

The results, finally, of the t tests for the 1972-73 school year are shown in Table 13. Once again, on the basis of these results, and carrying out step 4 of the t test procedure,.it follows that the null hypothesis is accepted at the .01 level of significance. Thus, no significant difference was found between the readiness scores for the experimental and control groups for the 1972-73 period.

TABLE 13

ANALYSIS OF READINESS SCORES FOR EXPERIMENTAL AND CONTROL GROUPS: 1972-73*

	Experimental Group		Control Group	
Student	gain	$gain^2$	gain	$gain^2$
1	3	9	0	0
2	6	36	-2	4
3	5	25	-1	1
4	10	100	2	4
5	4	16	-1	1
6	10	100	-1	1
7	12	144	6	36
8	12	144	2	4
9	10	100	9	81
10	13	169	9	81
11	15	225	6	36
12	15	225	6	36
13	12	144	7	49
14	12	144	8	64
15	22	484	14	196
16	20	400	9	81
17	21	441	18	324
18	19	361	15	225
19	16	256	18	324
20	14	196	23	529
Sum	251	3719	147	2077
Mean	12.05		8.35	

*$t = \frac{12.05 - 8.35}{6.53(.316)} = 1.793$, which is not significant at the .01 level.

Analysis of Achievement Scores

To determine whether or not the achievement scores of the experimental group and the control group showed a statistically significant difference, a t test was also performed on these scores for each of the three experiments. The results of the t tests are shown in Table 14. On the basis of these results, it follows that the null hypothesis is accepted at the .01 level of significance. No significant difference was found in the achievement scores of the experimental and control groups for each of the three experiments.

TABLE 14

ANALYSIS OF ACHIEVEMENT SCORES FOR EXPERIMENTAL AND CONTROL GROUPS

Year	t
1970-71	.504
1971-72	.825
1972-73	1.880

Tables 11 through 14 showed that at the .01 level of significance there is no statistically significant difference between the experimental and control groups in regard to readiness gains and achievement test scores.

Analysis of Variance

Table 15 shows the achievement test scores of twenty middle class and twenty culturally disadvantaged subjects in the experimental and control groups taken over a three year period. Table 16 is an

analysis of variance of the data in Table 15. This analysis shows (1) that there is no statistically significant difference in the achievement scores of the experimental and control groups, and (2) there is no statistically significant difference in the achievement scores of middle class and culturally disadvantaged subjects.

The question arises as to whether or not the culturally disadvantaged subjects made significant gains as a result of a whole-day session. A t test performed on the mean achievement scores of only the culturally disadvantaged experimental and control groups resulted in $t = 1.128$, which is insignificant at the .01 level. Thus there was no statistically significant gain in achievement by the experimental over the control group with respect to culturally disadvantaged subjects only. A similar analysis applied to only the middle class subjects gave a result of $t = 1.384$, again no significant difference.

TABLE 15

ACHIEVEMENT TEST SCORES OF MIDDLE CLASS AND CULTURALLY DISADVANTAGED OVER A THREE YEAR PERIOD: 1970-73

	Experimental Group		Control Group	
	Score	Score^2	Score	Score^2
20 Middle Class Subjects	119	14161	119	14161
	116	13456	110	12100
	113	12769	107	11449
	110	12100	91	8281
	100	10000	81	6561
	82	6724	74	5476
	81	6561	69	4761
	119	14161	108	11664
	110	12100	103	10609
	106	11236	101	10201
	103	10609	96	9216
	89	7921	85	7225
	77	5929	72	5184
	73	5329	119	14161
	112	13689	110	12100
	114	12996	105	11025
	108	11664	91	8281
	105	11025	69	4761
	89	7921	74	5476
	86	7396	81	6561
Sum	2012	207747	1865	179253
Mean	100.6		93.25	
20 Culturally Disadvantaged Subjects	120	14400	126	15876
	117	13689	117	13689
	116	13456	116	13456
	106	11236	101	10201
	100	10000	94	8836
	88	7744	84	7056
	77	5929	63	3969
	121	14641	119	14161
	112	12544	110	12100
	108	11664	107	11449
	96	9216	83	6889
	93	8649	83	6889
	78	6084	78	6084
	68	4624	55	3025
	120	14400	113	12769
	114	12996	106	11236
	112	12544	102	10404
	99	9801	88	7744
	91	8281	72	5184
	89	7921	88	7744
Sum	2025	209819	1905	188761
Mean	101.25		95.25	

TABLE 16

ANALYSIS OF VARIANCE*

	Experimental Group	Control Group	Row Sums
Middle Class	2012	1865	3877
Culturally Disadvantaged	2025	1905	3930
	4037	3770	7807

	Sum of squares	df	Mean Square
Row Means	35	1	35
Column Means	891	1	891
Residual	21459	77	279
Total	22385	79	

Computations for the above are as follows:

Sum of squares for row means $= \frac{3877^2}{40} + \frac{3930^2}{40} - \frac{7807^2}{80} = 35$

Sum of squares for column means $= \frac{4037^2}{40} + \frac{3770^2}{40} - \frac{7807^2}{80} = 891$

Total sum of squares $= \Sigma(80 \text{ scores})^2 - \frac{7807^2}{80} = 784250 - 761865 = 22385$

Residual = Total - Row means - Column means = 21459

Row effects: $F = \frac{35}{279} = .125$ Column effects: $F = \frac{981}{279} = 3.19$

*Conclusions from the above data: The F ratio for column effects is 3.19, which is less than the critical 3.98. Therefore, there is no significant difference between the achievement scores of the experimental and control group at the .05 level of significance.

The F ratio for row effects is .125, far below the critical 3.98. Therefore, there is no significant difference between the achievement scores of the middle class and culturally disadvantaged subjects.

First Grade Placement and Reading Achievement

Tables 8 through 10 in Chapter III give data on the subsequent first grade placement and reading achievement level of both the experimental and control groups. The summary of Table 8 showed identical patterns of placement for both section and level. The summary of Table 9 showed that, compared to the control group, the experimental group placed three more subjects in section B and three more subjects in level 5. The summary of Table 10 showed that, compared to the control group, the experimental group placed four more subjects in section A, two more in reading level 6, and two more in reading level 5. Although this data shows a definite bias in favor of the experimental group insofar as section placement and reading level attainment are concerned, it does not show a sufficiently large difference to be of any great significance.

Chapter IV Summary

T tests show that at the .01 level of significance readiness score gains and achievement scores did not differ significantly between the experimental and control groups. T tests also show that culturally disadvantaged children show no significant difference in achievement as a consequence of a full-day program. The same result holds for middle class children.

Analysis of variance at the .05 level of significance was consistent with the above results and also showed no statistically significant difference in achievement between middle class and culturally disadvantaged subgroups.

Comparison of experimental and control groups in regard to their subsequent first grade placement and reading level attainment show some gains in favor of the experimental group, but no great overall difference.

CHAPTER V

FINDINGS, RECOMMENDATIONS, AND CONCLUSIONS

The problem of chief concern for this study centered on three main questions:

1. Do full-day kindergarten groups achieve more than half-day groups?

2. Do full-day kindergarten groups attain higher placement or reading levels than half-day groups in their subsequent first grade placement?

3. Is there any special benefit for culturally disadvantaged children in being given a full-day program instead of a half-day program?

Evidence was compiled in two main ways: (1) an experimental study carried out over a three year period, and (2) a review of the literature having a direct or indirect bearing on the problem.

Findings

In terms of various measures of achievement, it would seem natural that pupils in an all-day kindergarten group would show more progress than the pupils in a half-day kindergarten. However, the results of this study showed that even when cultural factors were considered, there was no statistically significant difference between the two groups as measured by tests of readiness and achievement. Nor was

there any significant difference between the two groups in subsequent first grade placement and reading level attainment one year later. This finding is borne out by analysis of the test scores through use of the statistical t test and analysis of variance.

A survey of the literature showed that not all research studies were in agreement concerning the results of the experimental study described earlier. A number of studies have indicated that kindergarten does have a positive effect on later school achievement and that beginning reading, writing, and arithmetic experience can be part of the kindergarten program. There was also evidence to suggest that a properly designed full-day kindergarten program can improve achievement and serve as a form of compensatory education. However, as authorities generally concede, the various possible psychological and social effects should be carefully considered as well as the measurable gains to be achieved in kindergarten.

Recommendations

On the basis of the results of the experimental study, it cannot be recommended that the full-day kindergarten be established on grounds of greater measurable academic achievement. It is recommended, rather, that where measurable benefits resulting from a full-day kindergarten can be demonstrated, it should be seriously considered.

Because of the inconclusive nature of research on the subject, general recommendations should be made with caution. Not all significant or valid goals of education are easily measurable, and it is quite conceivable that local conditions and certain specific goals might warrant a full-day kindergarten.

Conclusions

The kindergarten must continue to be a place where children can adjust readily; but it must also be a place where children are helped to deal with significant ideas about their physical and social world. Although many factors in modern society make it possible for children to know more today at an earlier age, care must be taken to design potential full-day kindergarten programs so as to avoid premature pressure for achievement.

It should not be assumed that young children's modes of reasoning and experiencing reality are different from that of adults or that the scientific method used by the physical scientist is equally appropriate to the study of man. Such assumptions might lead to too much, too soon: to a warping of children to please parents and depriving young children of their right to childhood.

A child's first six years are important ones in which a lasting impression is created upon individual intelligence, personality, and physical and mental growth; therefore, the public rightfully can demand the best possible education in those crucial years. This must include the availability of a sound full-day kindergarten program for culturally and economically disadvantaged children of Somerset County.

As a result of this study, which has been conducted with the knowledge of the general public of Somerset County, a full-day kindergarten at Princess Anne Elementary School will be continued. Also, two other schools in Somerset County will be adding full-day kindergartens in the next school year. The children will be placed in the three full-day kindergartens on the basis of cultural and economic

deprivation. Twenty children will be selected for each full-day session on the same basis: conferences with parents, a social worker, county and school nurses, knowledge of home backgrounds, and pre-testing. After gathering this information, the principal of each respective school, using the advice of the supervisor of instruction, will place the children in the full-day kindergarten groups.

The three full-day kindergarten classes will be funded on an equal participation basis by Somerset County Board of Education and ESEA, Title III for the next school year.

APPENDIX A

GENERAL OBJECTIVES IN THE KINDERGARTEN PROGRAM

(Princess Anne Elementary School)

1. To provide a series of related experiences in order to give each child an awareness of his place in a well-balanced school program. To extend his understanding of the social world through association with his peers, other adults, and the school situation.

2. To provide an opportunity for each child to learn to work and play democratically in a group, both as a leader and as a follower. To develop respect for the rights and ideas of others and practice in socially acceptable ways of resolving feelings of anger and frustration.

3. To help the child become more intelligently self-directive in solving his own problems. To provide practice in the skills of learning through questioning, research and problem-solving at his level of maturity.

4. To help develop within the child responsibility toward himself and others.

5. To help each child to feel secure within himself, so that he may become a happy, wholesome individual. To maintain and develop health and emotional ability as well as growth in feelings of self-confidence, self-worth and self-reliance.

6. To provide opportunity for the child to participate in all types of functional experiences and in the use of all types of materials. To develop a general attitude and desire for learning by nurturing his sense of curiosity and by providing learning tasks appropriate for him, as an individual.

7. To provide an opportunity for the child to express himself creatively through art media, music, poetry, dramatics and rhythmic activities.

8. To extend the child's control of language through hearing and using new words, expressing his own ideas and feelings, listening to and retelling stories, dramatics and role playing.

9. To expand the child's understanding of the scientific world through observations, experimentation and visual aids.

10. To provide an opportunity for each child to grow in his understanding of quantitative relationships through number, measurement, comparative words, shape and form.

11. To make provisions for the child's physical development through learning healthful habits of play and rest and through building coordination, strength, and physical skills.

12. To begin a happy separation from home.

13. Mastery of skills in listening to comprehend the ideas of others.

14. Development of desire for continued learning.

15. Developing a good positive self-concept of himself throughout the child's school experience. Make each child feel important and that he belongs.

When the goals and objectives of early childhood education are met, the child has a sense of worth and fulfillment and is responsive to the worth and needs of others. For most children, these goals will not be fully met by age three, or five, or eight. Rather, the child in his early years will begin an educational process which, if nurtured and developed throughout a lifetime, will help him to become a worthwhile and responsible human being.

The guidelines we follow for early childhood education are issued by the Maryland State Department of Education. The Federal Government has recently revised the poverty threshold for a family of four. These families earning less than $4,300 per year are considered poverty-stricken. Thus a significant portion of Somerset County residents, over one-third, are living in poverty. Therefore, the culturally and economically disadvantaged children need a full-day kindergarten.

APPENDIX B

BASIC CURRICULUM AND ENRICHMENT AND/OR
REINFORCEMENT ACTIVITIES

This curriculum attempts to specify, develop, and refine a continuing curriculum for five-year-olds. As a result of daily interaction with children, the staff revises the curriculum as needed and will do so in the future on a continuing basis.

The structure of the curriculum insures a degree of success, direction and security for the novice teacher. The master teacher is offered a creative springboard in the form of a multiplicity of approaches for teaching a child in any given skill. The sequential structure and the graded steps of the curriculum make it adaptable for paraprofessional use. Cognitive objectives in this program are stated in behavioral terms and identified in five areas:

Physical and Motor Coordination
Language
Mathematics
Science, Health, Safety, Social Studies
Social

Behavioral Objectives

Physical and Motor Coordination

The child can skip, hop, jump, sway, climb, and balance himself.

The child can manipulate puzzles, blocks, scissors, pencils, crayons, paint brushes, small pegs, and beads.

The child can throw a ball, catch a ball, bounce a ball, kick a ball.

The child can handle himself on playground equipment designed for Early Childhood.

The child can clap and tap a steady beat.

The child can lace and tie.

The child can button, zip, and hook.

Language

The child can distinguish between sounds (knock, bell, etc.).

The child can listen to stories and poems.

The child can listen to peers.

The child can listen and follow simple directions.

The child can listen and give back a message.

The child can hear rhyming words.

The child can give rhyming words.

The child can hear beginning sounds of words.

The child can name words with given beginning sounds.

The child can express himself in words and sentences.

The child can give a sequence of events.

The child can repeat a story.

The child can recognize his name and names of others.

The child can recognize signs.

The child can classify pictures and objects.

The child can recognize colors.

The child can recognize color words.

The child can recognize letters.

The child can make letters.

The child can work in a left to right progression.

The child can print his name.

Mathematics

The child can make circles, squares, rectangles, and triangles.

The child can see likenesses and differences in shapes and sizes.

The child can see a pattern.

The child can reproduce a pattern.

The child can match objects one-to-one.

The child can recognize numerals.

The child can make numerals.

The child can count by rote.

The child can recognize the number of objects in a given set and make new sets by combining and/or dividing.

The child can match numerals with numbers.

The child has some knowledge about the calendar (year, month, week, day).

The child becomes familiar with such terms as: large, larger, largest; small, smaller, smallest; little, big; same, more, less, greater; top, middle, bottom; up, down; over, under; on, front, back; right, left; tall, short; think fat; first, second, third, fourth, fifth.

The child can dial phone numbers.

The child can recognize time on the hour.

Science, Health, Safety, Social Studies

The child can use simple science equipment, such as magnet, magnifying glass, etc.

The child can recognize seasonal changes by using his five senses (pictures of flowers, hearing thunder, etc.).

The child can practice good health habits by using a tissue, washing hands, flushing toilet, etc.

The child can follow safety rules through proper use of playground equipment, walking trips and bus excursions.

The child can care for plants and animals through making a terrarium and aquarium.

The child can recognize simple facts pertaining to holidays through art media and creative dramatics.

The child is aware of his surroundings and can appreciate the work of others (principal, other school staff, postman, fireman, etc.).

Social

The child can work and play in a group or alone by showing positive behavior.

The child can share materials by taking turns.

The child can take care of his personal belongings by hanging up his coat and keeping his crayons in a box, etc.

The child can recognize his property and that of his teacher and peers by not bothering things that belong to others.

The child can show some independence and responsibility by choosing an activity, completing it and putting materials away.

The child can feel free to interact with the teacher and other children.

The child practices good manners by using such words as please, thank you, excuse me, etc.

The child helps plan and assess activities designed for his growth and development.

Enrichment for Full-Day Kindergarten

Each child is prescribed individual tasks on the basis of his previous work and his level of performance in that work. Inherent in each task are the following significant components:

repeated opportunities for degree of success

opportunities for various levels and types of conceptualization

using a variety of media

opportunities for enlarging the child's vocabulary.

The child is helped to succeed in his tasks through an appropriate combination of the following:

independent activities

one-to-one tutoring

small group instruction (four or five per group)

extended self-selected activities (learning stations)

The child's work is continuously evaluated by both the teacher and himself. This evaluation includes teacher-made tests designed to assess the degree to which each specific objective is being achieved. Careful records are kept of each child's progress for each day.

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